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In Pursuit of Clean Air: A Data Book of Problems and Strategies at the State Level

Volume 4 Federal Regions V and VII

D. B. Garvey and D. G. Streets

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ARGONNE NATIONAL LABORATORY
Energy and Environmental Systems Division

prepared for
U. S. DEPARTMENT OF ENERGY
Assistant Secretary for Environment
Office of Technology Impacts
Policy Analysis Division
under Contract W-31-109-Eng-38

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Printed in the United States of America. Available from National Technical Information Service, U. S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161

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9700 South Cass Avenue
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IN PURSUIT OF CLEAN AIR: A DATA BOOK OF PROBLEMS AND STRATEGIES AT THE STATE LEVEL

Volume 4: Federal Regions V and VII

by

D.B. Garvey and D.G. Streets

Integrated Assessments and Policy Evaluations Group
Energy and Environmental Systems Division

February 1980

prepared for

U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Environment
Office of Technology Impacts
Policy Analysis Division and Environmental Impacts Division

Volume 4

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PREFACE

The Clean Air Act Amendments of 1977 reaffirmed a national commitment to clean air, setting up rigorous requirements intended to achieve and maintain the National Ambient Air Quality Standards in all areas of the country. The solutions to air quality problems, however, must take place at the state and local levels. This five-volume report provides a state-by-state summary of air quality, nonattainment areas, and attainment strategies, based, in part, on the revised State Implementation Plans submitted in response to the 1977 Amendments. The report is designed to provide useful information for policy analysis in the Department of Energy, especially for the examination of possible areas of conflict between the implementation of a national energy policy calling for the increased use of coal and the pursuit of clean air. The report provides an initial basis of information and will be updated as SIPs for nonattainment areas are altered and as the designations of areas are changed.

Major funding for this project was provided by the Policy Analysis Division of the Office of Technology Impacts, DOE/EV, with additional support from the Environmental Impacts Division of OTI. Project direction was provided by Doug Carter of PAD/OTI and John Wilson of EID/OTI.

The report was prepared by the Energy and Environmental Systems Division (EES) of Argonne National Laboratory (ANL), with the assistance of the ANL Applied Mathematics Division in digitizing the maps of designated nonattainment areas by use of the ALICE system. Mary Snider (ANL/EES) prepared the computer maps and D. Seymour (ANL/EES) provided the computer data. Additional contributions to the report were provided by R. Kotecki, former staff member of EES.

PREFACE

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LIST OF ABBREVIATIONS

APCD	- Air Pollution Control District
AQCR	- Air Quality Control Region
Btu	- British thermal unit
CAAA	- Clear Air Act Amendments
EPA	- Environmental Protection Agency
FGD	- flue gas desulfurization
FMVECP	- Federal Motor Vehicle Emissions Control Program
FPC	- Federal Power Commission
LAER	- lowest achievable emission rate
m^3	- cubic meter
MSER	- most stringent emission rate
MM	- million (10^6)
MW	- megawatt (10^6 watts)
μg	- microgram (10^{-6} gram)
NAAQS	- National Ambient Air Quality Standards
Pollutants	- CO = carbon monoxide
	HC = hydrocarbons
	NO_x = nitrogen
	O_x = photochemical oxidants (including ozone)
	PM = particulate matter
	SO_2 = sulfur dioxide
	TSP = total suspended particulates
	VOC = volatile organic compounds
ppm	- parts per million
PSD	- prevention of significant deterioration
RACM	- reasonably available control measures
RACT	- reasonably available control technology
SAROAD	- Storage and Retrieval of Aerometric Data
SIP	- state implementation plan

INTRODUCTION

The actions that must be taken to achieve national air quality goals, as prescribed by federal clean air legislation and subsequent regulations promulgated by the Environmental Protection Agency (EPA) may have significant impacts on the future siting and emission control requirements for new major sources of emissions, on future patterns of fuel use, and on the success of a national energy policy designed to increase the use of coal in both the utility and industrial sectors of the economy. Since the most recent amendments to the Clean Air Act were passed by Congress in August 1977, attention has focused on the implications of various portions of the legislation for economic growth and development in general, and on the possible conflicts that might arise between energy policy goals and environmental policies for the maintenance and improvement of national air quality.

The 1977 Clean Air Act Amendments (CAAA) provided a comprehensive scheme for air quality management across the nation, covering areas where the air is currently cleaner than the levels set by the National Ambient Air Quality Standards (NAAQS) under the requirements for the Prevention of Significant Deterioration (PSD), and areas where the air is dirtier than the standards (nonattainment areas). Those sections of the Amendments, and subsequent EPA regulations, governing nonattainment areas have been a focus of particular interest to energy policy makers. The legislation required states to submit revised cleanup plans (State Implementation Plans or SIPs) outlining procedures for achieving the standards by December 31, 1982, with possible extensions to December 31, 1987, for carbon monoxide and oxidants. The deadline for submittal of the plans to EPA was set at January 1, 1979, with July 1, 1979, set as the deadline for an EPA-approved plan to be in effect. Severe sanctions -- a ban on the construction of new sources of emissions and a limit on federal funds for highway construction and sewage treatment plants -- were to be placed on any state failing to have a revised plan approved by the July 1 deadline.

Information on nonattainment areas -- for example, their location, the requirements for new sources being sited in or near such areas, the controls to be applied, and the degree of cleanup to be achieved by existing sources -- is important for an analysis of the interactions between energy

[illegible] quality goals. Consequently, a project was begun in January 1979 to review all revised SIPs for nonattainment areas, to outline the causes and proposed cures, and to provide digitized maps of the subcounty areas designated as nonattainment by the states. The new source review procedures and the emission limitations for particulate matter (PM) and sulfur dioxide (SO_2) that apply to fuel combustion were summarized for each state. In order to provide additional background material for evaluating the extent of nonattainment and the possible constraints on energy development, maps have been prepared of the locations of monitors and of power plants. The maps are accompanied by information drawn from EPA and Federal Power Commission (FPC) data bases, such as the ambient concentrations recorded at specific monitors and the generating capacity of and fuel used by the utility plants.

This information was gathered for all 48 contiguous states, and is presented in Volumes 2 to 5 of this report, which are organized by Federal Region. For each state (placed in alphabetical order within the Federal Region) the following material is provided:

1 STATE TITLE PAGE

A summary of air quality data is presented to enable the reader to judge the general condition of a state at a glance. The summary lists the number of discrete (i.e., noncontiguous) nonattainment areas for each pollutant, the number of monitors with valid readings for a particular averaging time for a pollutant, and the number of monitors that recorded a violation of the standard. (Note that the monitors that have adequate data to be used for determining an annual average are a subset of the monitors that are valid for the 24-hour averages.) To complete the quick survey of a state, the numbers of fossil-fueled and nuclear power plants are included on the title page.

2 REVISED SIP OUTLINE

This brief examination of the contents of the revised SIP covers the sources of the problems, the proposed strategies for achieving attainment, and the new source review procedure the state intended to follow in the nonattainment areas. The version of the SIP used (e.g., draft or final and date) is indicated. The comprehensiveness of the coverage of these outlines varies, reflecting the version available when the report was prepared and the com-

pleteness of the documentation by the state. (In general, the states submitted revised plans in a piecemeal fashion, area-by-area and pollutant-by-pollutant.) The outlines attempt to draw the separate submissions into a comprehensible picture for the state as a whole.

Section I of the outline describes the sources of nonattainment in the state. Section II outlines the strategies the state proposed for attaining the standards. Since the report concentrates on those pollutants most likely to affect an energy policy directed at increased coal use, the strategies for attaining the SO_2, total suspended particulates (TSP), and nitrogen oxides (NO_x) standards are examined more closely than those for carbon monoxide (CO) and oxidant (O_x) standards.

SO_2 problems are usually the result of emissions from individual major point sources (frequently out of compliance with existing SIP requirements) and attainment strategies address cleaning up those particular sources. TSP problems are more frequently blamed on fugitive dust. The attainment strategies are often somewhat vague indications that possible controls will be examined and required, as appropriate. Most states requested the 18-month extension that was available for the submittal of a plan to attain the secondary TSP standard. EPA granted the extension, if the state had demonstrated that reasonably available control technology (RACT) was already required for all stationary point sources and that controls on fugitive process emissions and on nontraditional sources (such as road dust) would be necessary for attainment.

The attainment strategies for CO and O_x depend on the reduction of emissions from motor vehicles, through the projected effects of the Federal Motor Vehicle Emissions Control Program (FMVECP) combined with general estimates of vehicle turnover, i.e., rates of replacement of older vehicles. States requesting the statutory extension of the deadline for attainment to December 31, 1987, were required to include RACT on point sources (as specified in EPA's control techniques guidances for 11 stationary sources of volatile organic compounds or VOC), traffic control measures (as outlined in EPA's guidelines), and an inspection and maintenance program for motor vehicles.

Section III of the outline briefly describes the new source review a state planned to follow in nonattainment areas, noting in each case whether an

le or a growth allowance would be used. Section IV lists the PM and SO_2 emission limitations required by the SIP for fuel combustion in existing sources. (Note that standards for ambient air quality are expressed in terms of TSP, whereas emissions limits on sources are expressed in terms of PM.)

3 MAPS OF NONATTAINMENT AREAS, AS DESIGNATED

In order to determine the areas for which revised SIPs would be needed, the 1977 Amendments to the Clean Air Act required a formal list of areas where the standards were being violated. The original designations were made in March 1978. A number of changes in the designations were made as additional air quality data became available. The maps in this report are based on designations as of May 1979.

Additional changes in the attainment status of a number of areas have been made since May 1979. The majority of the changes have occurred in the designations for the oxidant standard. As a result of EPA's revision of the standard, many areas could be redesignated as in attainment of the less stringent level. Few changes have been made in the CO nonattainment areas. The areas were already drawn to be quite small, often around a central business district. Minimal changes have been made since May 1979 in SO_2 nonattainment areas. Two areas in Ohio have become attainment (as noted in the outline) and New Mexico has drawn even smaller nonattainment areas around sources (in one case, a circle of one-mile radius). TSP areas have been subject to considerably more redesignation activity -- areas are drawn smaller; areas formerly exceeding the primary standard are proposed as exceeding only the secondary standards; areas that were violating the secondary standard are redesignated as attainment.

It is expected that this project will update the maps of nonattainment areas to reflect these changes. The areas currently shaded on the maps must still be viewed as potential problem areas. An area that has just become attainment or that is just outside the boundaries of a designated nonattainment area may still not be able to support new sources of emissions.

The absence of a map for a pollutant indicates either that the state was in attainment, or (in the case of oxidants only) that the entire state was designated as nonattainment. The title page for each state indicates

pollutant data that were not mapped. The nonattainment maps and other maps that follow them are numbered sequentially through this volume; these sequential numbers are preceded by a roman numeral identifying the Federal Region a given state is in.

4 SAROAD DATA

A computer print-out provides a listing of all the monitors within a state, with a number for each monitor, its latitude and longitude, and its recorded pollutant concentrations (in $\mu g/m^3$, or mg/m^3 for CO) based on 1975 data from EPA's Storage and Retrieval of Aerometric Data (SAROAD) system. The monitor readings were coded as follows:

Code	Reading (% of standard limit)
1	0-75
2	76-100
3	101-125
4	>125

Monitors that clearly had incorrect latitudes and longitudes (i.e., falling outside the state boundaries when mapped) were not plotted; they are indicated by an asterisk. The monitors were numbered sequentially in their order in the data base, and only monitors for the criteria pollutants were printed. Missing numbers in the sequence represent monitors for noncriteria pollutants.

5 SAROAD DATA MAPS

Monitors that were shown in the data base as having adequate data on a particular pollutant were mapped, with a shaded circle to indicate a monitor that recorded a violation of a particular standard (reading codes 3 and 4) and an unshaded circle to indicate a monitor that did not record a violation in 1975 (reading codes 1 and 2). Maps were provided for each pollutant and each averaging period of the NAAQS, and appear in the following order: 24-hour SO_2, annual average SO_2, 24-hour average TSP, annual average TSP, 8-hour average CO, 1-hour average O_x, and annual average NO_x. Pollutants or standard averaging periods for which a state had no valid monitor reading are not represented by monitor maps, and the absence of a map is noted on the title page for the state. A key map identifies each monitor by its unique

number. Where monitors are clustered and their numbers cannot be read, the range of monitor numbers is indicated for reference to the monitor listing.

6 POWER PLANT DATA

On the basis of 1975 FPC data (as contained in EPA's Energy Data System), power plants within each state are listed and assigned a number. The printout contains the plant name, latitude and longitude, operating capacity, and convertible capacity as estimated by EPA's Strategies and Air Standards Division. Plants for which specific locations are not given in the data base or which have clearly incorrect latitude and longitude are noted as "not plotted." Information on fuel use for each plant is also provided, listing the amount of coal (1000 tons per year), oil (1000 barrels per year), and gas (1000 x 10^6 cubic feet per year) burned in 1975, and the average percentage of sulfur in the coal and oil. The absence of fuel use data indicates that the information for the particular installation was not available in the data base. In many cases, such a plant is a proposed or new facility which was not operating in 1975.

7 POWER PLANT MAPS

The power plants in each state are mapped according to the following scheme: a shaded square represents a fossil fuel-fired facility of 1000 MW capacity or more; an unshaded square, a fossil fuel-fired facility smaller than 1000 MW; and a triangle represents a nuclear facility. In addition, a key map identifies the power plants by location and number.

8 COUNTY MAPS

Finally, for general information, a map of each state showing county boundaries and county names is provided.

Federal Region V

Covering the States of:

Illinois

Indiana

Michigan

Minnesota

Ohio

Wisconsin

REGION V: ILLINOIS

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a]		No. of Monitors	No. of Monitors Recording Primary Violations
		Primary	Secondary		
SO_2	24 hr	2	0	108	8
	1 yr			66	1
TSP	24 hr	9	23	160	11
	1 yr			131	14
NO_x	1 yr	1	-	58	3
CO	8 hr	2	-	18	5
O_x	1 hr	7	-	27	21

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

Energy Facilities	
Fossil Fuel	38
Nuclear	6
Total	44

ILLINOIS: Draft SIP, 6/79

I. SOURCES OF THE PROBLEM

Illinois has designated nonattainment areas for five criteria pollutants. In the 1978 designations, 29 counties contained areas that were violating the TSP standards. Around steel mills in Chicago and East St. Louis, particulate concentrations average 2.5 times higher than the primary health standard. In Chicago, urban fugitive dust, primarily from mobile sources, accounts for 45% of the particulates. Point sources (steel plants, quarries, grain processing facilities, and three Commonwealth Edison power plants) add about 20% to the particulate load. In Decatur (Macon Co.), TSP violations result from emissions from unpaved roads (26%), construction (30%), industrial point sources (20%), and agricultural activity (15%). Peoria's particulate emissions are the result of road dust (65%), agriculture (15%), and point sources (12%). The latter are largely fugitive process emissions from grain product handling. (The city of Peoria affects Peoria, Tazewell and Woodford Counties). In the Quad Cities area (Rock Island Co., including the Illinois cities of Rock Island and Moline), about 65% of the particulates are urban fugitive dust, the result of mobile sources and unpaved roads. Agricultural activities and construction each account for approximately 10% of the emissions. In St. Louis (the counties of Madison, St. Clair and Monroe), point sources (steel plants, a Shell Oil plant, and several plants operated by the Illinois Power Co.) account for about 20% of particulate emissions. Agricultural activities and wind erosion are responsible for 45% of the emissions, with unpaved roads contributing 25%. An area of primary violation in Sangamon County surrounds the state capital, Springfield. Construction is judged to be the source of 40% of Springfield's particulate emissions, with 20% from stationary point sources and another 20% from dirt roads. The remaining area of primary TSP nonattainment is in LaSalle County, surrounding the town of LaSalle; emissions from dirt roads contribute about 60% of the excess particulates.

There are two SO_2 nonattainment areas in Illinois -- in Peoria and Tazewell Counties, surrounding the city of Peoria, and in Massac County, along the Ohio River in southern Illinois. In Peoria, the major contributor of SO_2 is Commonwealth Edison's Powerton plant, responsible for 68% of the

total emissions in 1975. This plant is projected to be retired and replaced by 1985. The second largest source was the Edwards Station of Central Illinois Light Company (CILCO), which emitted 18% of the total SO_2; CILCO's Wallace Station contributed only 5%. The new CILCO Duck Creek Station was not operating in the base year of 1975, but is expected to be on line by 1985. In Massac County, the Joppa plant of Electric Energy Inc. emits 42% of the SO_2, and the Missouri Portland Cement plant emits 2%. TVA's Shawnee Power Plant in Kentucky produces more SO_2 emissions in Massac County than any sources in that Illinois county.

The NO_x problem in Illinois is confined to an 80-square-block area in the central business district of Chicago, and is primarily due to mobile sources. In all of Cook County, mobile sources produce 42% of the NO_x, whereas 35% comes from stationary sources, primarily utility and industrial boilers.

Twenty counties are in nonattainment for O_x and all but four of the remaining counties are unclassified because of questionable or insufficient monitoring data. Illinois considers the problem to be statewide, although only Chicago and East St. Louis experience regular violations. On a statewide basis, mobile sources contribute 50% of the VOC emissions. Solvent use (e.g., cutback asphalt, dry cleaning, and degreasing) is the next largest source, contributing 14%. Industrial surface coating adds 12%, while storage and marketing of petroleum add 9%. Stationary sources account for about 10%.

CO nonattainment is confined to the freeway corridors in Chicago and the central cores of Chicago and Peoria, primarily due to mobile sources.

II. ATTAINMENT STRATEGIES

A. SO_2

1. Chicago, Peoria and East St. Louis

   a. Current SIP emission limit is 1.8 lb SO_2 per MM Btu

   b. Resulted in attainment for Chicago and East St. Louis

   c. Peoria and Tazewell Counties should be redesignated as attainment and/or unclassified

      - based on modeling analyses
      - assumes compliance with 1.8-lb emission limitation

2. Massac County

   a. Violations caused by two power plants

      - TVA's Shawnee in Kentucky
      - Electric Energy's Joppa

   b. Both plants are raising stacks as high as consistent with good engineering practice

   c. TVA plant is also to reduce emissions and adhere to compliance schedule

   d. 24-hour violations will continue until the TVA plant is in compliance

3. Will adopt regulations to control malfunction and maintenance

B. TSP

1. Existing point sources

   a. Current SIP emission limitations represent RACT

      - no further control to be required
      - regulations to be adopted to control malfunction and maintenance of control equipment

   b. Reinstate the Illinois EPA's limit on particulate matter from coal combustion sources

      - Chicago major metropolitan area: 0.1 lb PM per MM Btu for all existing sources
      - elsewhere in state:

        Sources with fuel input $\leq$ 10 MM Btu/hr: 1.0 lb PM per MM Btu

        Sources with fuel input > 250 MM Btu/hr: 0.1 lb PM per MM Btu

        Interpolate limits within this range for sources of intermediate size

      - rule currently remanded by court

   c. Controls on steel mills

      - new control required specific to each type of steel process or equipment
      - to be based on "more consistently achievable control technology limitations"
      - could result in reductions of emissions by 60-75%
      - to be used in St. Louis and Chicago areas only

--p" rule

a. To prohibit facilities that are in substantial over-compliance from switching to less effective control technology

b. Applies to Cook, Will, Macon, and Madison Counties only

3. Fugitive emissions from industrial sources

a. Control required on:

- storage piles
- conveyor loading operations
- roads and parking areas

b. controls based on EPA guidances

4. Nontraditional fugitive dust

a. By 12/31/79, complete a study on potential control of dust from unpaved roads, reentrainment, construction/demolition, and agricultural tilling

b. Coordinate with Illinois DOT regarding priority of paving projects

c. Coordinate with Federal Water Quality Program and Department of Agriculture regarding minimizing erosion

d. By 1/1/81, implement regulations recommended by the study mentioned in (a.) above

C. NO_x

1. FMVECP to reduce vehicle emissions

2. Existing NO_x controls on stationary sources adequate

D. O_x

1. Control of stationary sources

a. RACT for 15 categories listed in EPA's control techniques guidance

b. Control in rural as well as urban areas

2. FMVECP

3. Transportation control measures

a. Chicago area (bus/carpool lanes, carpool programs, access limitations for common carriers, long-range transit improvements, on-street parking controls, programs to encourage other than auto travel, traffic flow improvements)

b. St. Louis area (increase mass transit ridership, increase speeds at major employment centers, increase regional peak-hour speeds, increase car and van pooling)

c. Peoria metropolitan area

d. Springfield metropolitan area

4. Vehicle inspection and maintenance programs for Cook, DuPage, Kane, Lake, McHenry, Will, Madison, and St. Clair Counties (Chicago and St. Louis)

5. Request for extension to 1987 for Chicago and St. Louis areas

6. Coordinate planning for transportation and for air quality

E. CO

1. FMVECP

2. Vehicle inspection and maintenance program

3. Transportation measures instituted for O_x control

III. NEW SOURCE REVIEW

New sources in nonattainment areas will be permitted in accordance with USEPA regulations (i.e., pertaining to size, LAER, etc.). The SIP provides a limited growth allowance to cover increases in emissions from minor sources. An owner of a proposed new major source can petition for use of some portion of the growth allowance if it can be demonstrated that no offsets were available. The new source could be approved if emissions will not interfere with reasonable further progress and if the applicant agrees (legally) to provide appropriate offsets at some future time.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. Existing coal-fired sources

a. In Chicago, Peoria, and St. Louis major metropolitan areas

- 1.8 lb SO_2 per MM Btu

b. In other areas

- 6.0 lb SO_2 per MM Btu
- court currently ordered a limit of 6.8 lb SO_2 per MM Btu
- Illinois EPA attempting to reinstate the 6.0-lb limit

2. New sources using solid fuel

   b. Fuel input > 250 MM Btu/hr: NSPS

   c. Fuel input $\leq$ 250 MM Btu/hr: 1.8 lb SO_2 per MM Btu

B. TSP

1. Existing sources:

   See II.A., above

2. New coal-burning sources: NSPS

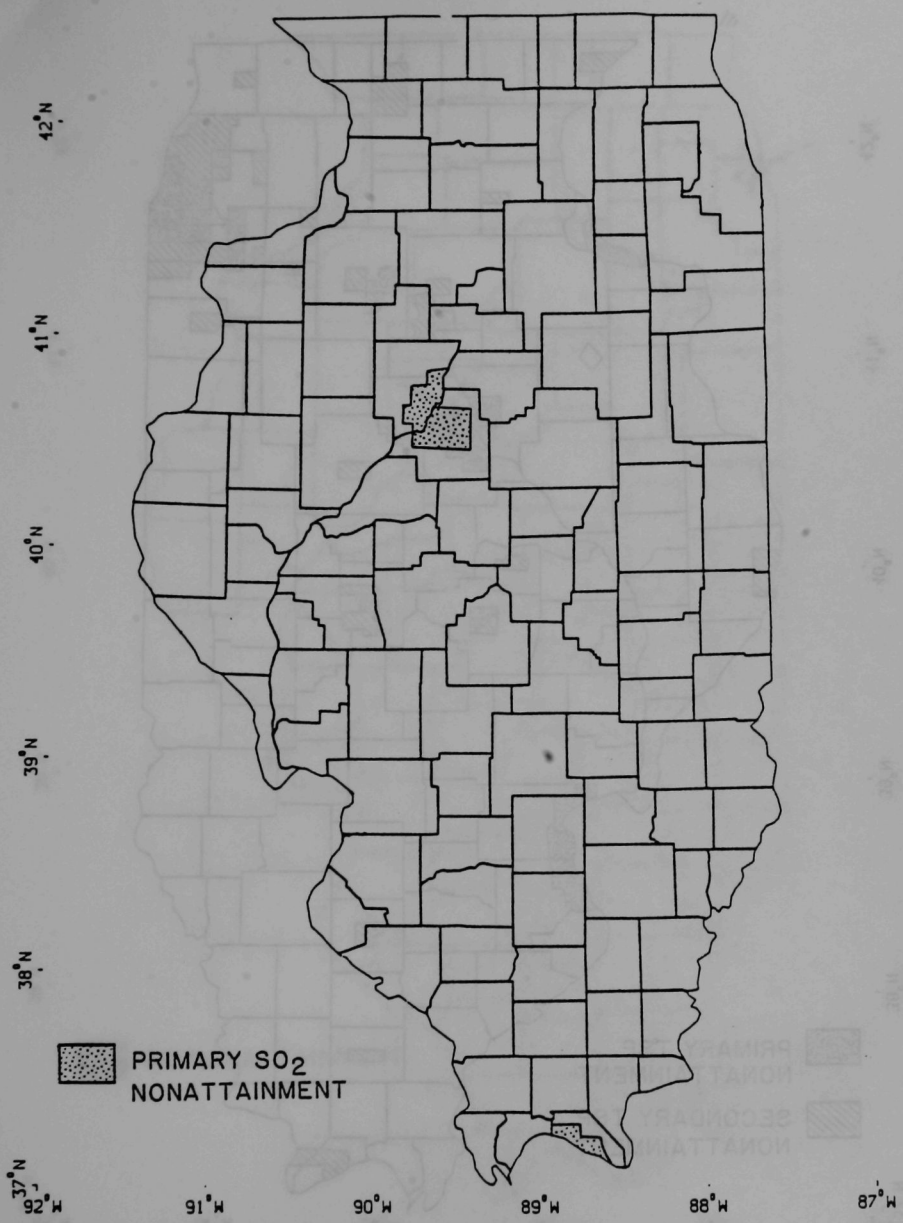


Fig. V.1. Illinois: SO_2 Nonattainment Areas as Designated May 1979

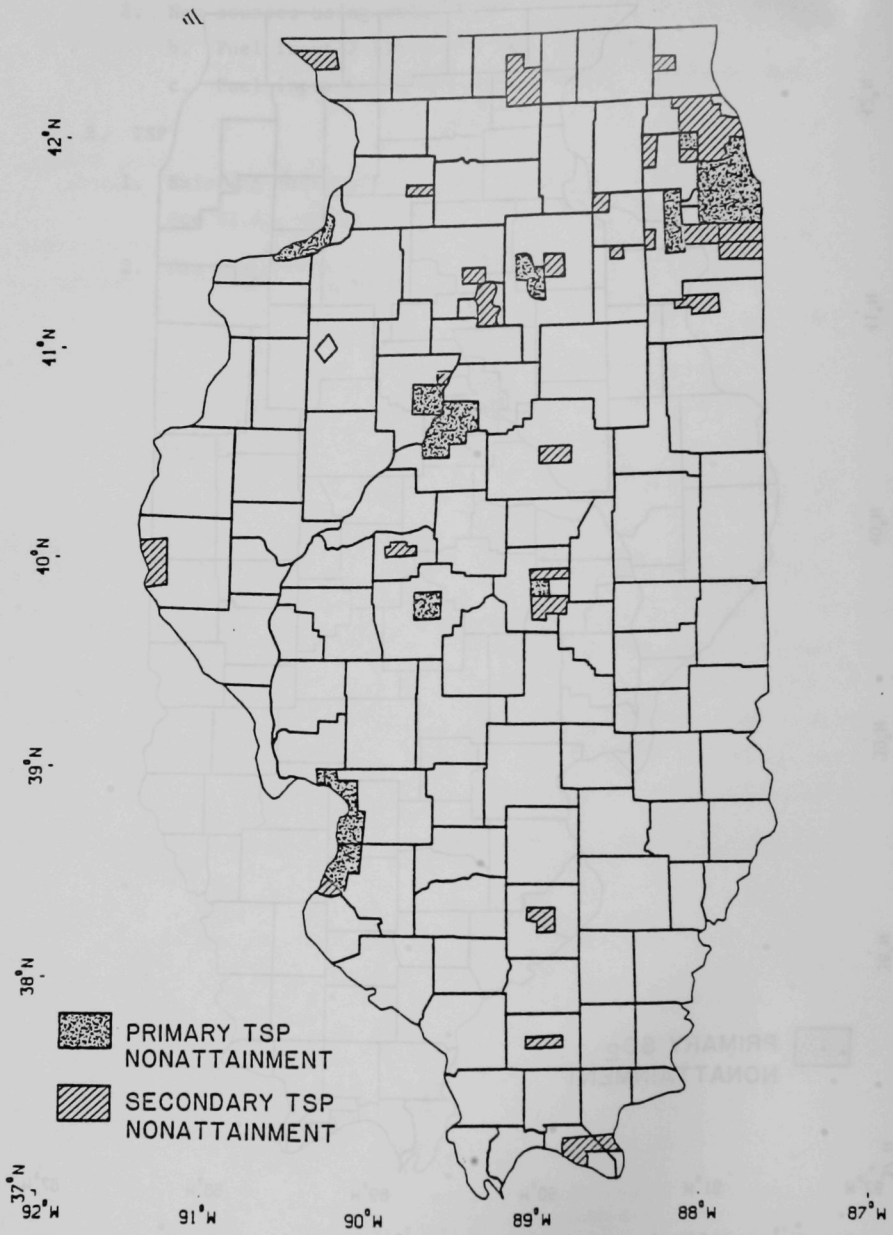


Fig. V.2. Illinois: TSP Nonattainment Areas as Designated May 1979

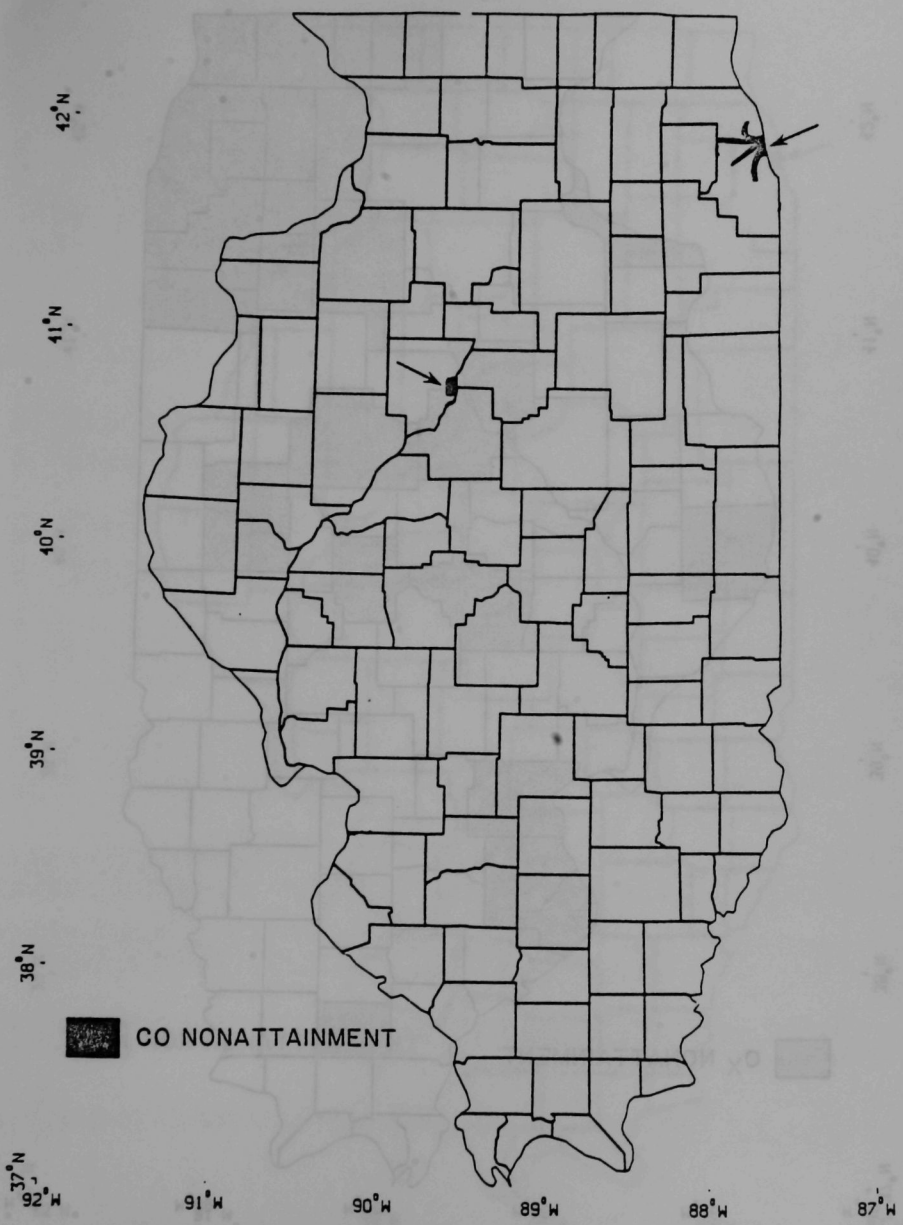


Fig. V.3. Illinois: CO Nonattainment Areas as Designated May 1979

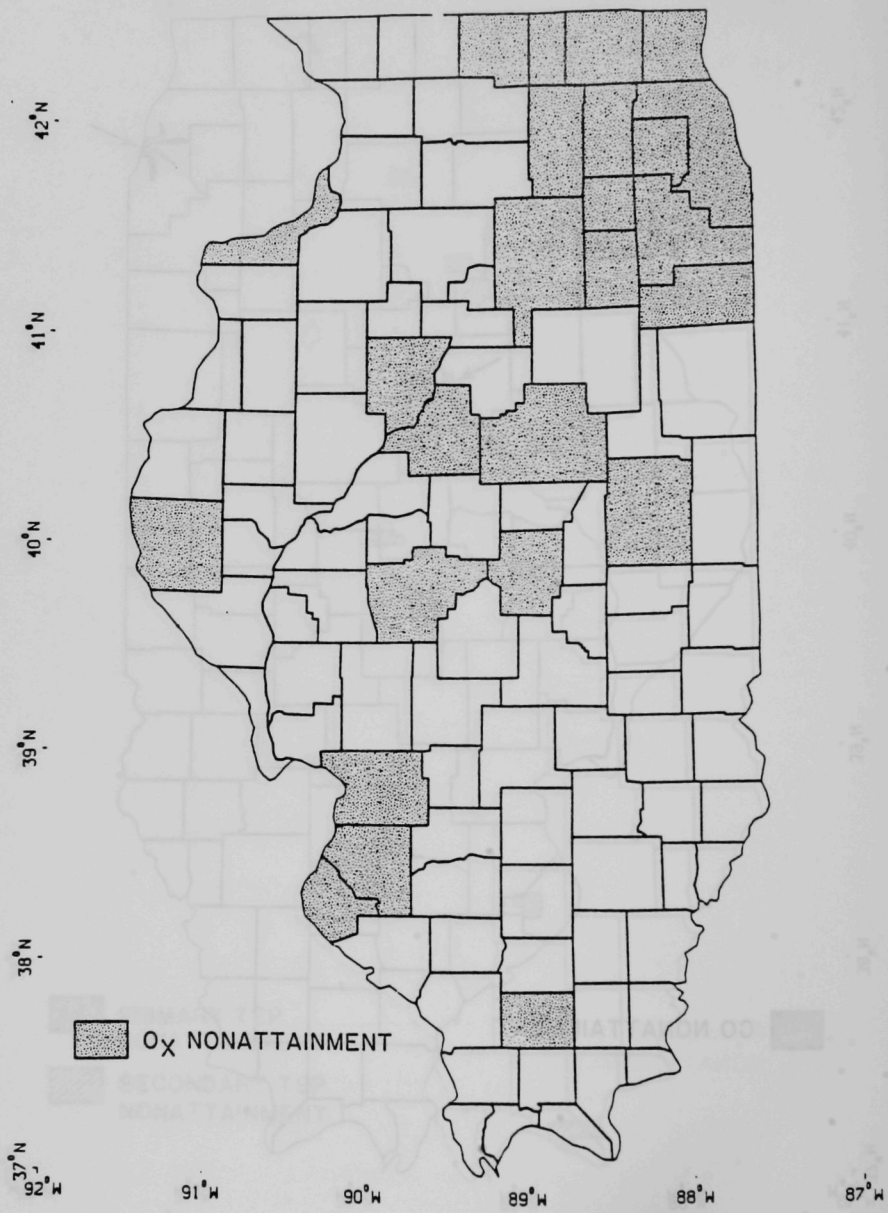


Fig. V.4. Illinois: O_X Nonattainment Areas as Designated May 1979

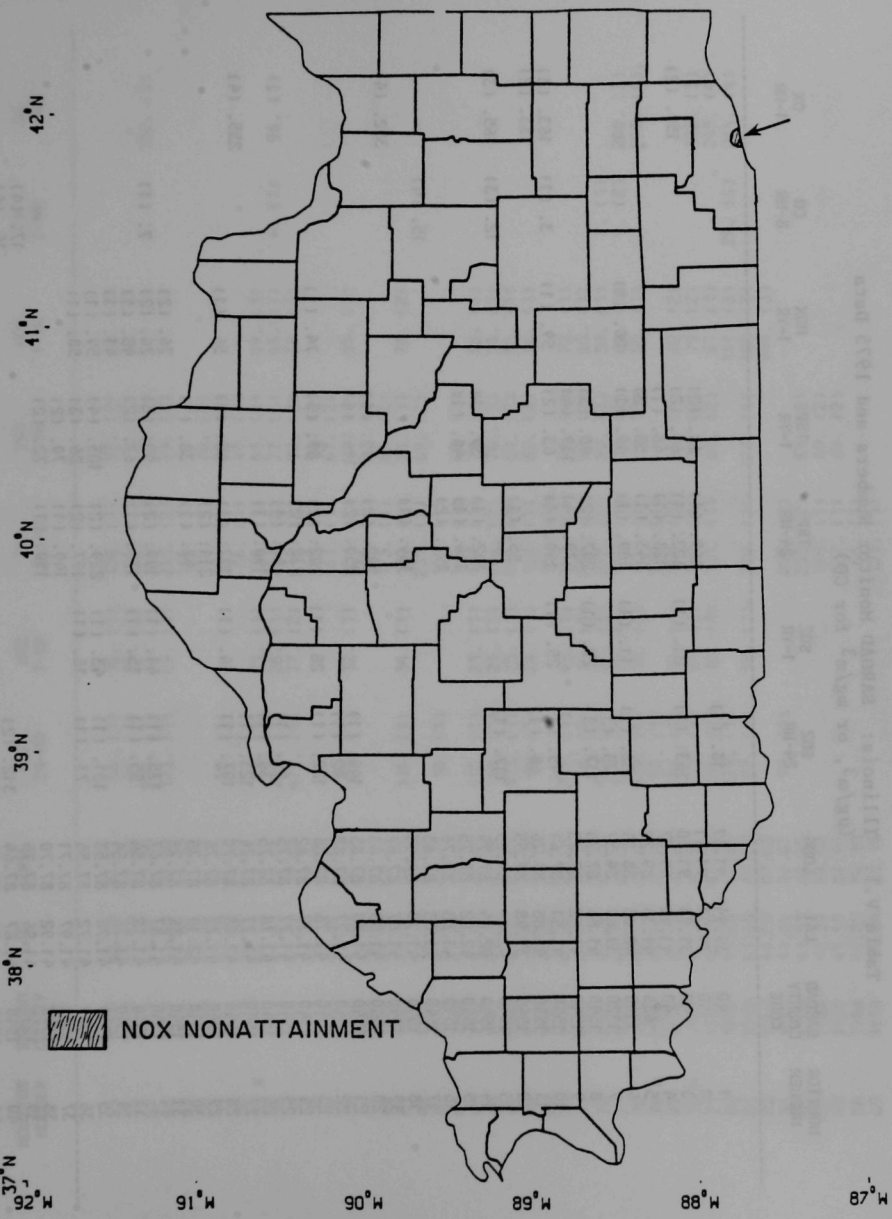


Fig. V.5. Illinois: NO_x Nonattainment Areas as Designated May 1979

Table V.1. Illinois: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	40	39.94	91.39	13. (1)						
2	40	39.91	91.41			169. (1)	61. (2)			159. (2)
3	40	39.93	91.40	163. (1)	21. (1)	122. (1)	61. (2)			
4	40	41.12	89.37			123. (1)	48. (1)			
5	680	41.33	89.29			143. (1)	58. (2)			
6	1160	40.08	88.24	52. (1)	11. (1)	109. (1)	46. (1)	26. (1)		
7	1320	39.69	89.37	73. (1)						
8	1540	41.86	87.75	137. (1)	27. (1)	207. (2)	90. (3)			
9	1540	41.52	87.63			479. (4)	139. (4)			
10	1540	41.51	87.64	145. (1)	25. (1)	150. (1)	63. (2)	59. (1)	3. (1)	163. (3)
11	1540	41.88	87.76	68. (1)						133. (2)
12	1540	39.98	87.55			55. (1)				
13	1540	42.06	87.75	117. (1)					12. (3)	165. (3)
14	1540	42.04	87.74			102. (1)	39. (1)			
15	1540	42.02	87.75			104. (1)	44. (1)			
16	1540	41.83	87.76			197. (2)				
17	1540	41.88	87.63						15. (4)	
18	1540	41.79	87.53			134. (1)				
19	1540	41.87	87.67							382. (4)
20	1540	41.80	87.83			212. (2)	99. (4)			
21	1540	41.80	87.83	144. (1)		250. (2)	104. (4)			
22	1540	41.77	87.82	42. (1)						
23	1540	41.78	87.80	122. (1)	28. (1)	202. (2)	89. (3)	74. (1)		
24	1540	41.77	87.82			232. (2)				
25	1540	41.77	87.75	60. (1)		97. (1)				
26	1540	41.78	87.75	39. (1)		190. (1)				
27	1540	41.77	87.76	123. (1)						255. (4)
28	1540	42.08	87.70	107. (1)	14. (1)	127. (1)	48. (1)	56. (1)		
29	1540	41.77	87.76			211. (2)				
30	1540	42.10	87.75			97. (1)	38. (1)			
31	1540	41.86	87.75					76. (2)		
32	1540	41.87	87.67	175. (1)	41. (1)	199. (2)	90. (3)	76. (2)	7. (1)	
33	1540	41.76	87.54	55. (1)	15. (1)	175. (1)	67. (2)	48. (1)		
34	1540	41.76	87.54					41. (1)		
35	1540	41.70	87.53	131. (1)	43. (1)	229. (2)	105. (4)	59. (1)		
36	1540	41.72	87.56	73. (1)	18. (1)	197. (2)	86. (3)	50. (1)		
37	1540	41.97	87.71			149. (1)	70. (2)			
38	1540	41.92	87.70			150. (1)	72. (2)			
39	1540	41.96	87.75						17. (4)	
40	1540	41.87	87.64	312. (2)					16. (4)	
41	1540	41.80	87.59	251. (1)	24. (1)	134. (1)	65. (2)	62. (1)		427. (4)
42	1540	41.78	87.75					62. (1)		
43	1540	41.69	87.54	97. (1)	34. (1)	367. (4)	148. (4)	59. (1)		
44	1540	41.78	87.78	131. (1)	29. (1)	157. (1)	68. (2)	62. (1)		

Table V.1. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
45	1540	42.00	87.67	68. (1)	16. (1)	130. (1)	57. (2)	62. (1)		
46	1540	41.65	87.54	94. (1)	25. (1)	195. (1)	78. (3)	53. (1)		
47	1540	41.87	87.90	224. (1)	16. (1)	160. (1)	68. (2)	71. (1)	6. (1)	182. (3)
48	1540	41.61	87.65	173. (1)	29. (1)	211. (2)	79. (3)	71. (1)		
49	1540	42.07	87.81			130. (1)				
50	1540	41.94	87.87			172. (1)	70. (2)			
51	1540	41.54	87.69	50. (1)		154. (1)	58. (2)			
52	1540	42.04	87.69			86. (1)	41. (1)			
53 *	1540	83.33	42.04	63. (1)	11. (1)	136. (1)	61. (2)	69. (1)		
54	1540	41.61	87.54	219. (1)	28. (1)	207. (2)	77. (3)	66. (1)	6. (1)	96. (1)
55	1540	41.66	87.69	479. (4)	77. (2)	219. (2)	92. (3)	70. (1)		
56	1540	42.08	87.98			159. (1)	72. (2)			
57	1540	41.89	87.81			161. (1)	67. (2)			
58	1540	41.51	88.33	89. (1)	12. (1)	222. (2)	51. (1)	55. (1)		
59	1540	42.09	88.11			119. (1)	51. (1)			
60	1540	41.65	87.86			175. (1)	65. (2)			
61	1540	41.96	88.14	115. (1)	34. (1)	139. (1)	53. (1)	78. (2)		
62	1540	42.04	87.84			235. (2)	69. (2)			
63	1540	42.00	87.77	18. (1)		160. (1)				
64	1540	41.62	87.72			168. (1)	62. (2)			
65	1540	41.87	87.64	115. (1)	21. (1)	167. (1)	73. (2)	58. (1)		
66	1540	41.74	87.57	84. (1)	23. (1)	246. (2)	76. (3)	58. (1)		
67	1540	41.75	87.65	123. (1)	25. (1)	186. (1)	69. (2)	58. (1)		
68	1540	41.82	87.70	94. (1)	28. (1)	180. (1)	85. (3)	65. (1)		
69	1540	41.88	87.67			156. (1)				
70	1540	41.90	87.64	217. (1)	43. (1)	198. (2)	94. (4)	72. (1)		
71	1540	41.93	87.78	58. (1)	19. (1)	205. (2)	67. (2)	65. (1)		
72	1540	41.69	87.64	132. (1)	30. (1)	272. (3)	80. (3)	58. (1)	7. (1)	
73	1540	41.75	87.73	121. (1)	29. (1)	181. (1)	75. (2)	64. (1)	9. (2)	200. (3)
75	1540	41.78	87.67	569. (4)	16. (1)	130. (1)	63. (2)	59. (1)		272. (4)
76 *	1540	41.88	87.76	50. (1)		170. (1)				
77	1540	41.88	87.63	181. (1)	49. (1)	192. (1)	95. (4)	82. (2)		
78 *	1540	41.96	87.67	113. (1)	34. (1)	149. (1)	70. (2)	79. (2)		182. (3)
79	1540	41.98	87.79	156. (1)	18. (1)	131. (1)	60. (2)	67. (1)		245. (4)
80	1540	41.88	87.63	170. (1)				109. (3)	24. (4)	294. (4)
81	1540	41.88	87.63	87. (1)	50. (1)	190. (1)	121. (4)	103. (3)		
82	1540	41.88	87.63					104. (3)		
83	1540	41.89	87.63	92. (1)		245. (2)				
85	1800	41.93	88.75			252. (2)	65. (2)			
86	1980	42.34	88.02			164. (1)	69. (2)			
87	1980	41.90	87.94			127. (1)	69. (2)			
88	1980	41.85	88.10			68. (1)				
89	1980	41.86	88.10			151. (1)				

Table V.1. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
90	1980	41.89	83.20			184. (1)	70. (2)			
91	1980	41.91	88.24			283. (3)	68. (2)			
92	1980	41.77	83.15			205. (2)	68. (2)			
93	1980	41.93	87.99			135. (1)	68. (2)			
94	1980	41.97	87.94	147. (1)	30. (1)	148. (1)	55. (1)	55. (1)		
95	1980	41.96	87.94			270. (3)	93. (3)			
96	2220	39.12	88.54	55. (1)	12. (1)	156. (1)	58. (2)	20. (1)		
97	3580	37.70	89.22			87. (1)	38. (1)			
98	3640	38.32	88.91			92. (1)				
99	3640	38.31	88.90	18. (1)		133. (1)				
100	3700	42.41	90.43	34. (1)	10. (1)	204. (2)	70. (2)	18. (1)		
101	3800	42.06	88.27			138. (1)	60. (2)			
102	3860	41.65	88.53			160. (1)				
103	3920	40.95	90.36	24. (1)						
104	3920	40.95	90.36	100. (1)		154. (1)	73. (2)			
105	4000	42.38	87.84	108. (1)						
106	4000	42.37	87.88	65. (1)						
107	4000	42.37	87.87	168. (1)						
108	4000	42.36	87.84			192. (1)	65. (2)			
110	4000	42.33	87.86			114. (1)				
111	4000	42.33	87.86			93. (1)	47. (1)			
113	4000	42.27	87.85			121. (1)	42. (1)			
114	4000	42.27	88.20			124. (1)	47. (1)			
115	4100	41.33	89.11	111. (1)	36. (1)			29. (1)		223. (4)
116	4100	41.35	88.84	26. (1)		111. (1)	55. (1)			
117	4100	41.36	88.84	73. (1)						
118	4540	42.22	88.24			126. (1)				
119	4540	42.24	88.32			106. (1)	46. (1)			
120	4560	40.48	89.00	94. (1)	18. (1)	118. (1)	64. (2)	39. (1)		
121	4560	40.52	88.99	118. (1)	32. (1)					
123 *	4620	39.86	94.95			176. (1)	66. (2)			
124	4620	39.87	88.94	18. (1)		108. (1)				
125 *	4620	39.86	94.92	63. (1)		209. (2)	105. (4)			
126	4620	39.84	88.95	31. (1)						
127 *	4620	39.87	94.92	150. (1)						116. (1)
128	4680	38.70	90.15	118. (1)		177. (1)	96. (4)			
129 *	4680	38.71	84.16			231. (2)	97. (4)			
130	4680	38.69	90.16			312. (3)	138. (4)			
131 *	4680	65.61	87.60			307. (3)	158. (4)			
132	4680	38.70	90.12			129. (1)	68. (2)			
133	4680	38.70	90.14	126. (1)		241. (2)	105. (4)			
135 *	4680	38.81	95.96			101. (1)	54. (1)			
136	4680	43.89	89.88			288. (3)				

Table V.1. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
137	4680	38.70	90.12			274. (3)	117. (4)			
138	4680	38.71	90.15	194. (1)	53. (1)					
140	4680	38.67	89.99			118. (1)	68. (2)			
141	4680	38.86	90.11			209. (2)	81. (3)			
142	4680	39.27	90.06	377. (3)						
143	4680	38.86	90.11	496. (4)	82. (3)			42. (1)	7. (1)	131. (2)
145	4680	38.89	90.18			154. (1)	78. (3)			
146 *	4680	38.88	84.16	329. (2)	57. (1)	145. (1)	67. (2)	35. (1)		245. (4)
147	4840	41.12	89.37	29. (1)	8. (1)			29. (1)		
148	4900	37.17	88.74	440. (3)	68. (2)	115. (1)	53. (1)	23. (1)		
149	4900	37.15	88.74	284. (2)	35. (1)	140. (1)	46. (1)			
150	4900	37.20	88.82	299. (2)	35. (1)					
151	4900	37.18	88.75	609. (4)	52. (1)	124. (1)	39. (1)			
152	5000	40.01	89.85			124. (1)	57. (2)			
153	5180	38.44	90.20			89. (1)	47. (1)			
154	6100	40.69	89.59	76. (1)						
155	6100	40.70	89.59						10. (2)	178. (3)
156	6100	40.70	89.62			164. (1)	70. (2)			
157	6100	40.79	89.62	63. (1)	19. (1)	145. (1)	58. (2)	31. (1)		
158	6100	40.69	89.61	414. (3)	71. (2)				5. (1)	174. (3)
159	6100	40.68	89.62	113. (1)	39. (1)			47. (1)		
161	6100	40.68	89.62			261. (3)	87. (3)			
162	6100	40.70	89.59	105. (1)	52. (1)	134. (1)	93. (3)	60. (1)		
163	6100	40.70	89.59	92. (1)		228. (2)	91. (3)			
164	6720	41.45	90.57			236. (2)	99. (4)			
166 *	6720	41.49	84.55			156. (1)	52. (1)			
167	6720	41.50	90.51			120. (1)	75. (2)			
168	6720	41.50	90.51			226. (2)	80. (3)			
170	6720	41.51	90.58			130. (1)	61. (2)			
171	6720	41.51	90.57	172. (1)	46. (1)					255. (4)
172	6720	41.51	90.53			130. (1)	76. (3)			
173	6720	41.51	90.58			104. (1)				
175	6720	41.52	90.44	110. (1)	19. (1)	164. (1)	82. (3)	47. (1)		
176	6900	38.66	90.07	175. (1)	38. (1)	275. (3)	103. (4)		5. (1)	235. (4)
177	6900	38.62	90.16	305. (2)	74. (2)			51. (1)	6. (1)	118. (1)
178	6900	39.00	90.17			171. (1)				
179	6900	38.63	90.16			149. (1)	80. (3)			
182	6900	38.53	88.95			119. (1)	63. (2)			
184	6980	39.80	89.66	109. (1)	19. (1)	167. (1)	70. (2)		7. (1)	
185	6980	39.80	89.65			125. (1)				
187	6980	39.80	89.66	100. (1)	23. (1)			40. (1)		202. (4)
188	7600	40.68	89.59	34. (1)						
189	7600	40.67	89.59	162. (1)		227. (2)	95. (4)			

Table V.1. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
191	7600	40.57	89.64			199. (2)	77. (3)			
192	7600	40.56	89.65	476. (4)	43. (1)					
193	7780	40.13	87.62	52. (1)						
194	7780	40.13	87.65	10. (1)						
195	7780	40.13	87.63	18. (1)						
196	8300	41.79	89.70			174. (1)				
197	8300	41.78	89.71			185. (1)				
198	8320	41.61	88.20			161. (1)	68. (2)			
199	8320	41.59	88.05	84. (1)		146. (1)	70. (2)			
200	8320	41.50	88.09	42. (1)						
201	8320	41.50	88.07			219. (2)	79. (3)			
202	8320	41.53	88.07	65. (1)		120. (1)	53. (1)			
203	8320	41.53	88.09	150. (1)	35. (1)	225. (2)	94. (4)		10. (2)	278. (4)
204	8320	41.54	88.05			183. (1)	72. (2)			
205	8320	41.55	88.09	92. (1)	14. (1)	183. (1)	78. (3)	54. (1)		
206	8320	41.53	88.12	121. (1)	19. (1)			55. (1)		
207	8320	41.30	88.13			156. (1)	69. (2)			
208	8320	41.53	87.89			159. (1)	62. (2)			
209	8320	41.42	87.74			102. (1)	48. (1)			
210 *	8320	41.51	87.40	128. (1)	17. (1)	200. (2)	97. (4)	43. (1)		
211	8320	41.66	88.08	139. (1)		150. (1)	65. (2)			
212	8320	41.45	87.63			132. (1)	60. (2)			
213	8320	41.53	88.08			51. (1)				
214	8320	41.53	88.12			163. (1)	71. (2)			
215	8320	41.53	88.08			140. (1)				
216	8320	41.53	88.08			97. (1)				
218	8340	37.73	88.95	165. (1)	15. (1)	123. (1)	46. (1)	21. (1)		227. (4)
219	8400	42.25	89.07	190. (1)	36. (1)					
222	8400	42.27	89.09	53. (1)		116. (1)	59. (2)			
223	8400	42.27	89.09			83. (1)	46. (1)			
225	8400	42.25	89.07					52. (1)		347. (4)
226	8400	42.24	89.05			100. (1)	41. (1)			

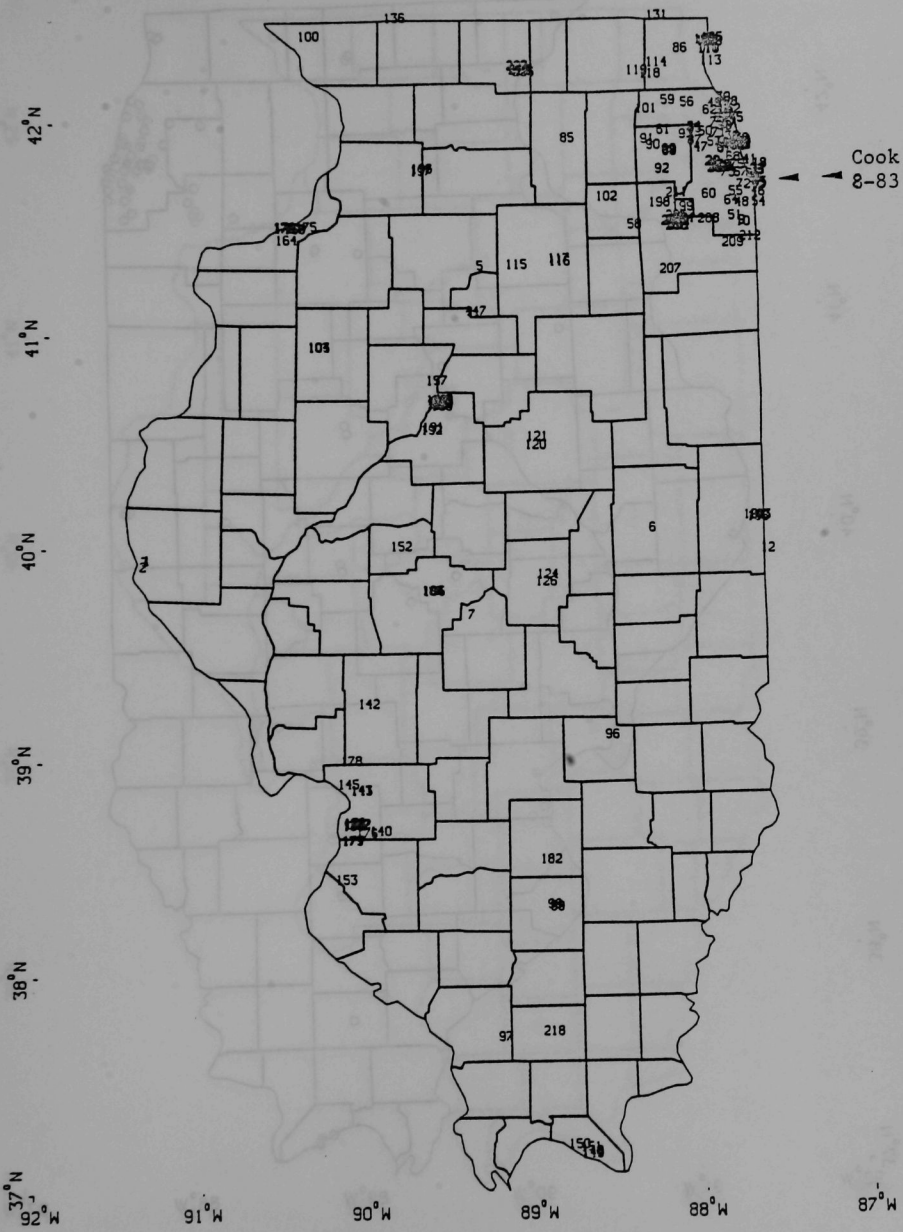


Fig. V.6. Illinois: Locations of SAROAD Monitors
(See Table V.I for Monitor Numbers)

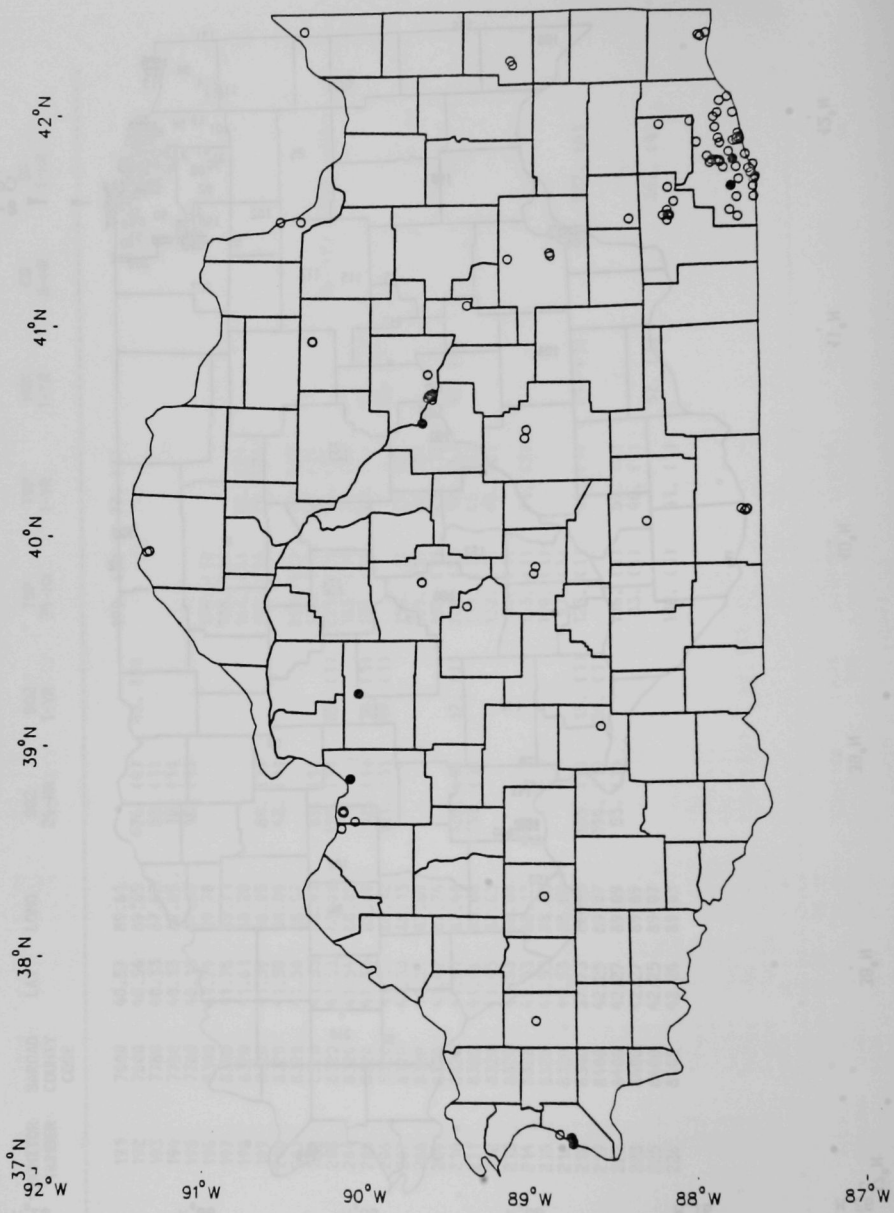


Fig. V.7. Illinois: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

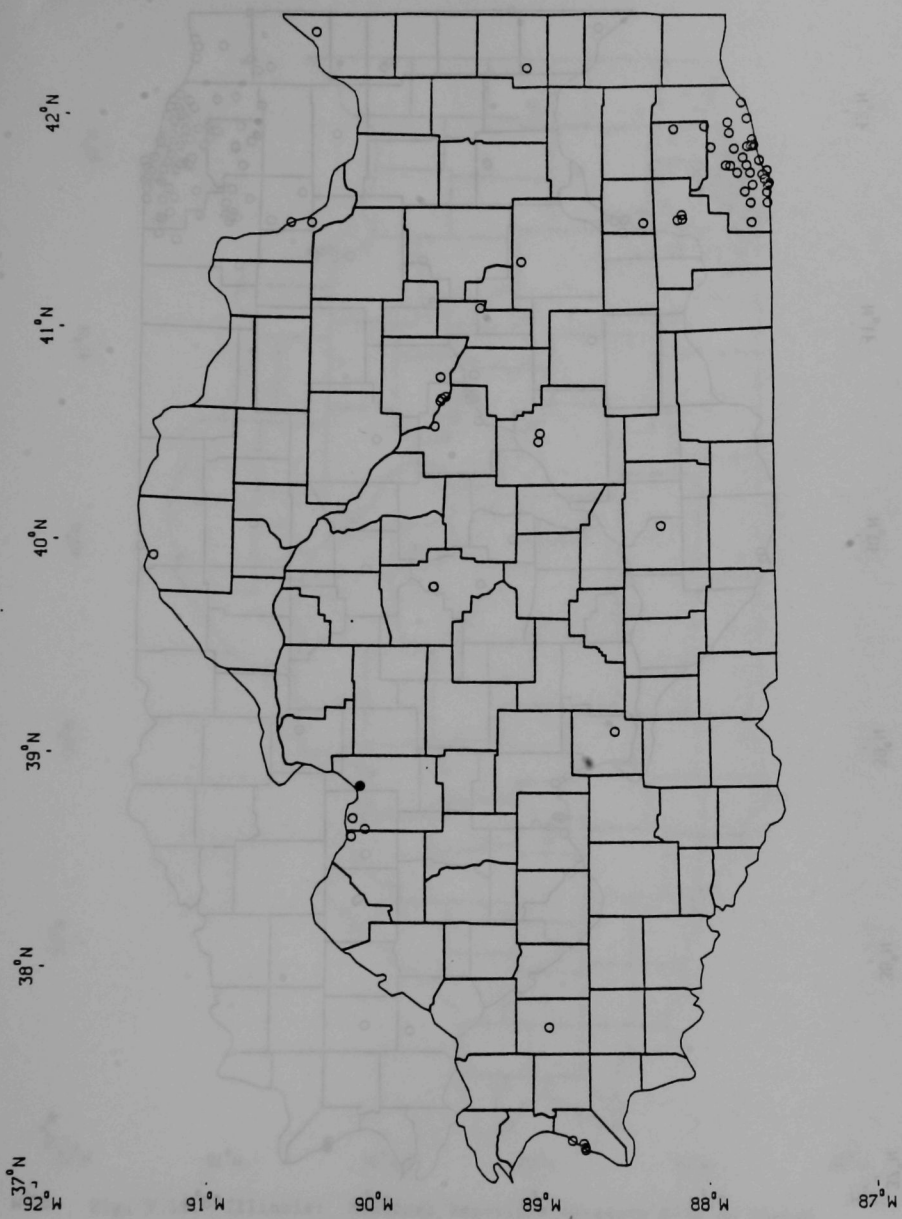


Fig. V.8. Illinois: Monitors Reporting Adequate Data on Annual Average SO_2; Violations Shown by Shaded Circles

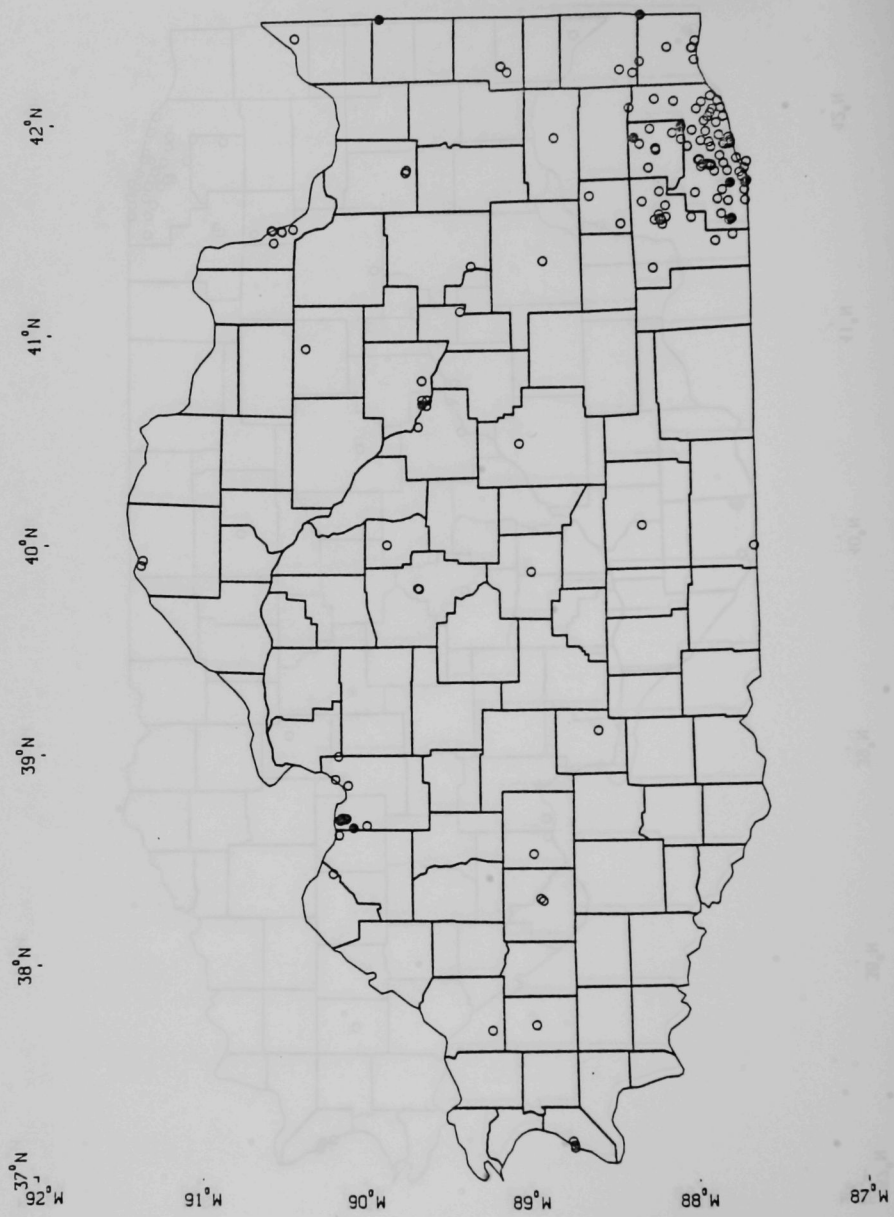


Fig. V.9. Illinois: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

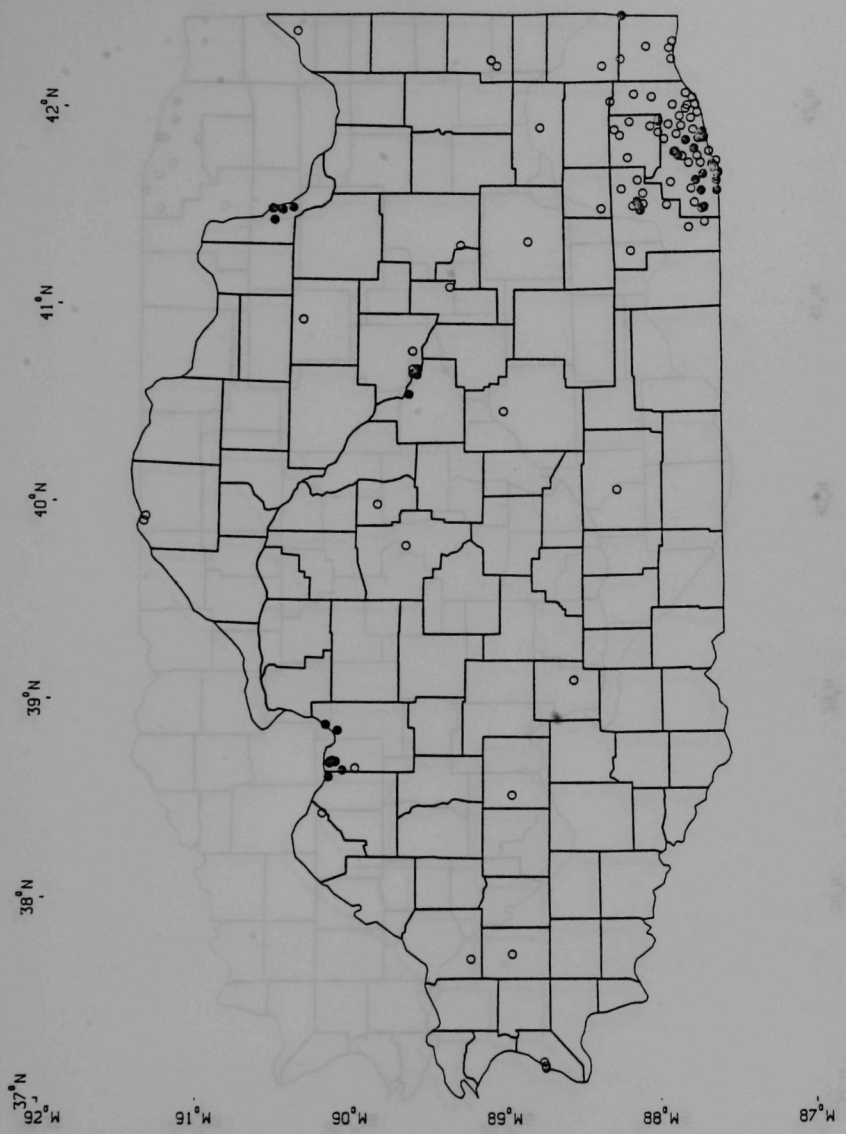


Fig. V.10. Illinois: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

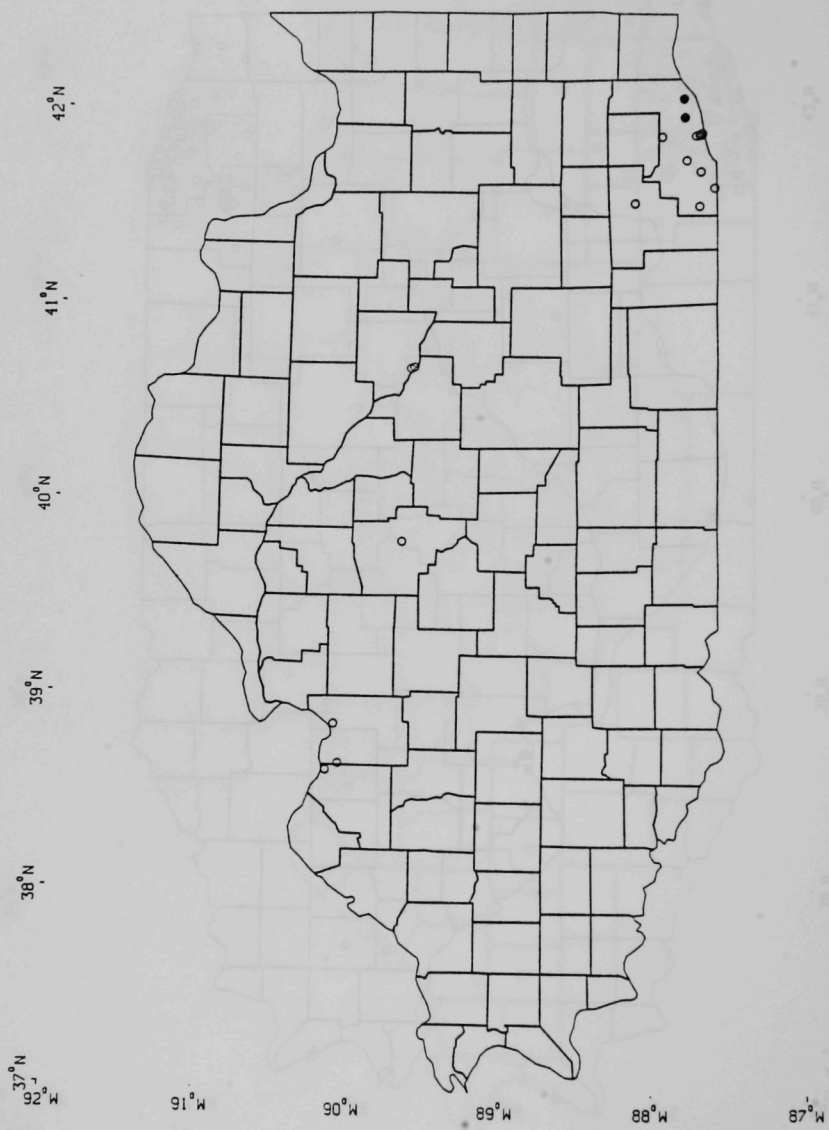


Fig. V.11. Illinois: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

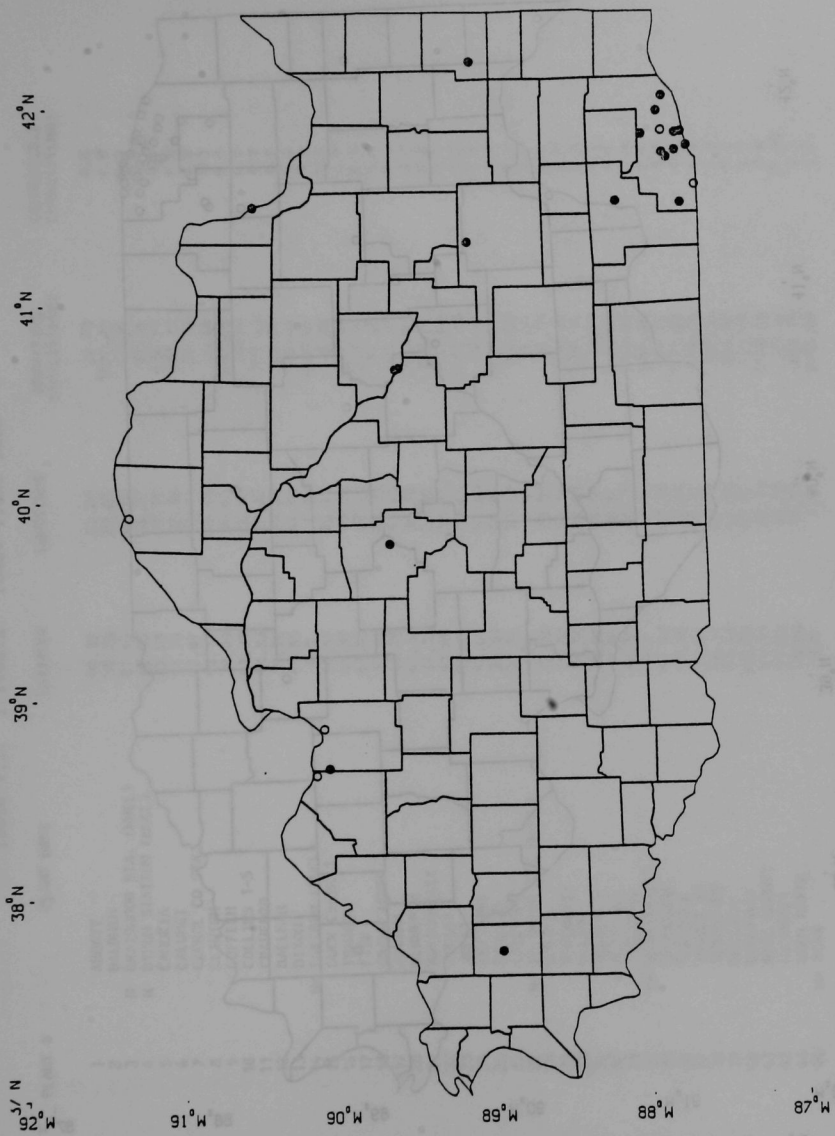


Fig. V.12. Illinois: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

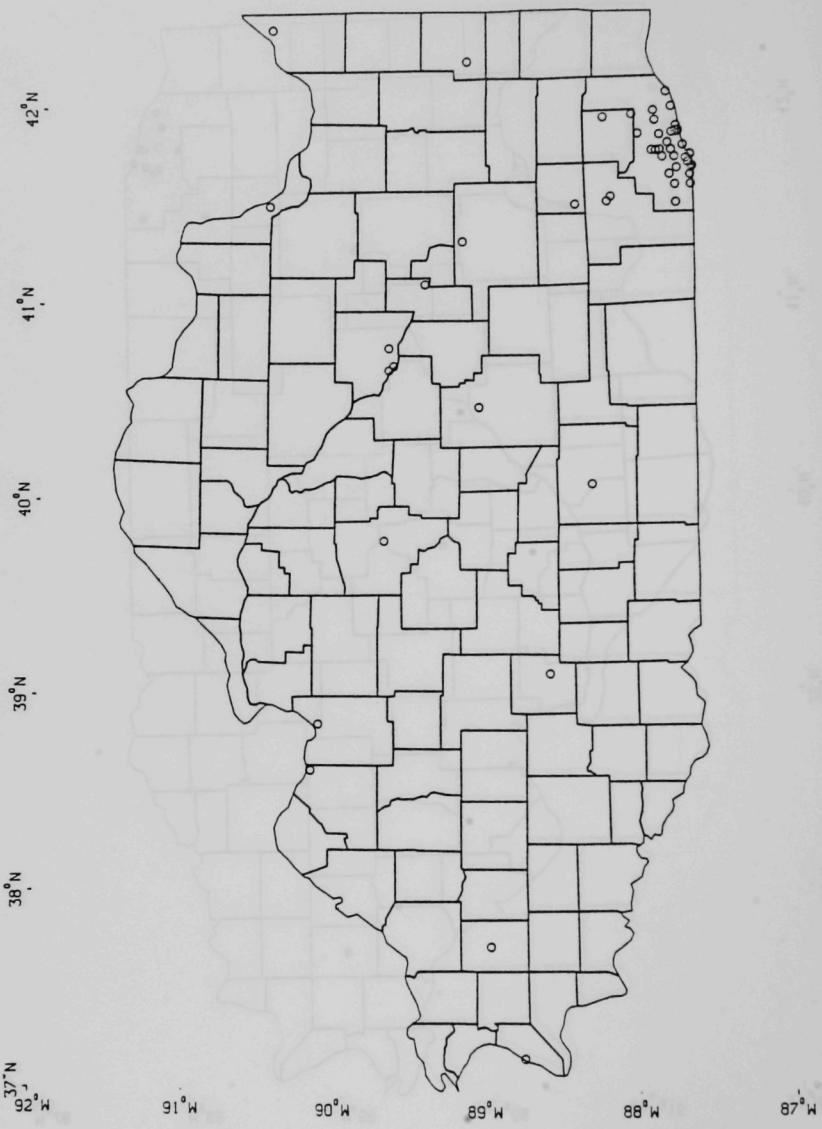


Fig. V.13. Illinois: Monitors Reporting Adequate Data on Annual Average NO_x; Violations Shown by Shaded Circles

Table V.2. Illinois: Power Plant Data

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		ABBOTT	40.12	88.24	30.00	0.0
2		BALDWIN	38.20	89.85	1892.05	0.0
3	N	BRAIDWOOD STA. (NUCL)	41.44	87.98	57.30	0.0
4	N	BYRON STATION (NUCL)	42.05	89.32	57.30	0.0
5		CAHOKIA	38.60	90.19	310.00	0.0
6		CALUMET	41.71	87.55	107.00	0.0
7		CARROL CO STA.	42.07	89.93	28.70	0.0
8		CLINTON	40.17	88.90	56.00	0.0
9		COFFEEN	39.09	89.40	1005.00	0.0
10		COLLINS 1-5	41.29	88.42	28.70	0.0
11		CRAWFORD	41.83	87.72	701.52	0.0
12		DALLMAN	39.76	89.60	160.00	0.0
13		DIXON	41.85	89.50	119.00	0.0
14	N*	DRESDEN (NUCL)	0.0	0.0	1865.00	0.0
15		DUCK CREEK 1	40.47	90.21	37.20	0.0
16		EDWARDS	40.59	89.66	697.00	0.0
17		FISK	41.85	87.65	547.00	0.0
18		GRAND TOWER	37.66	89.51	194.60	0.0
19		HAVANA	40.28	90.08	230.00	0.0
20		HENNEPIN	41.30	89.32	306.25	0.0
21		HUTSONVILLE	39.13	87.66	212.50	0.0
22		JOLIET	41.49	88.11	467.00	0.0
23		JOPPA	37.21	88.86	1100.25	0.0
24		KEYSTONE	40.64	89.65	50.00	0.0
25		KINCAID	39.59	89.49	1319.00	0.0
26		LAKESIDE	39.76	89.60	146.00	0.0
27	N*	LA SALLE STA (NUCL)	0.0	0.0	54.40	0.0
28		MARION	37.74	88.93	99.00	0.0
29		MEREDOSIA	39.82	90.56	548.00	0.0
30		MOLINE	41.50	90.59	79.14	0.0
31		NEWTON 1	39.00	88.08	37.20	0.0
32	*	PLANT X	0.0	0.0	37.20	0.0
33		POWERTON	40.54	89.68	1786.00	0.0
34	N*	QUAD CITIES	0.0	0.0	1657.00	0.0
35		RIDGELAND	41.81	87.78	690.00	0.0
36		SABROOKE	42.26	89.10	92.00	0.0
37		VENICE #2	38.67	90.17	474.00	0.0
38		VERMILION	40.18	87.75	182.30	0.0
39		WALLACE	40.68	89.59	308.00	0.0
40		WAUKEGAN	42.38	87.82	533.00	0.0
41		WILL COUNTY	41.49	88.11	1269.00	0.0
42		WINNETKA	41.84	87.82	25.50	21.00
43		WOOD RIVER	38.86	90.13	650.10	0.0
44	N*	ZION	0.0	0.0	2196.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.3. Illinois: Fuel Use Data

PLANT #		PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1		ABBOTT	0.0	0.0	0.23	41.09	0.0
2		BALDWIN	3.03	3958.60	0.10	62.40	0.0
3	N	BRAIDWOOD STA. (NUCL)	0.0	0.0	0.0	0.0	0.0
4	N	BYRON STATION (NUCL)	0.0	0.0	0.0	0.0	0.0
5		CAHOKIA	0.0	0.0	3.09	135.30	0.0
6		CALUMET	0.0	0.0	0.0	0.0	2003.90
7		CARROL CO STA.	0.0	0.0	0.0	0.0	0.0
8		CLINTON	0.0	0.0	0.0	0.0	0.0
9		COFFEEN	4.39	2310.80	0.03	82.80	0.0
10		COLLINS 1-5	0.0	0.0	0.0	0.0	0.0
11		CRAWFORD	0.43	1347.00	0.0	0.0	1592.50
12		DALLMAN	3.15	434.20	0.30	1.80	0.0
13		DIXON	3.03	213.00	0.0	0.0	1669.80
14	N*	DRESDEN (NUCL)	0.0	0.0	0.0	0.0	0.0
15		DUCK CREEK 1	0.0	0.0	0.0	0.0	0.0
16		EDWARDS	2.03	1687.02	0.10	7.98	0.0
17		FISK	0.38	1392.00	0.0	0.0	500.10
18		GRAND TOWER	3.73	515.80	0.20	5.60	0.0
19		HAVANA	0.0	0.0	0.67	699.60	0.0
20		HENNEPIN	2.86	676.40	0.0	0.0	65.60
21		HUTSONVILLE	2.85	404.20	0.23	112.20	0.0
22		JOLIET	1.96	547.00	0.0	0.0	87.60
23		JOPPA	2.76	3122.24	0.10	13.70	0.0
24		KEYSTONE	0.0	0.0	0.0	0.0	1506.15
25		KINCAID	4.18	2443.00	0.50	11.40	22.00
26		LAKESIDE	3.24	218.70	0.30	29.50	0.0
27	N*	LA SALLE STA (NUCL)	0.0	0.0	0.0	0.0	0.0
28		MARION	3.88	341.18	0.56	1.02	0.0
29		MEREDOSIA	3.39	691.60	0.10	183.50	0.0
30		MOLINE	0.0	0.0	0.50	156.20	1618.00
31		NEWTON 1	0.0	0.0	0.0	0.0	0.0
32	*	PLANT X	0.0	0.0	0.0	0.0	0.0
33		PONERTON	3.34	2797.60	0.0	0.0	63.20
34	N*	QUAD CITIES	0.0	0.0	0.0	0.0	0.0
35		RIDGELAND	0.0	0.0	0.84	4420.90	637.90
36		SABROOKE	4.02	17.00	0.50	542.00	33.40
37		VENICE #2	0.85	344.30	0.30	280.60	8.70
38		VERMILION	3.12	448.80	0.10	0.40	0.0
39		WALLACE	1.53	463.40	0.0	0.0	1874.30
40		WAUKEGAN	0.22	1818.00	0.10	23.60	7917.90
41		WILL COUNTY	0.87	2605.60	0.50	35.00	0.0
42		WINNETKA	0.72	5.37	0.0	0.0	15.35
43		WOOD RIVER	2.97	1037.20	0.25	393.80	2662.20
44	N*	ZION	0.0	0.0	0.0	0.0	0.0

N NUCLEAR * NOT PLOTTED

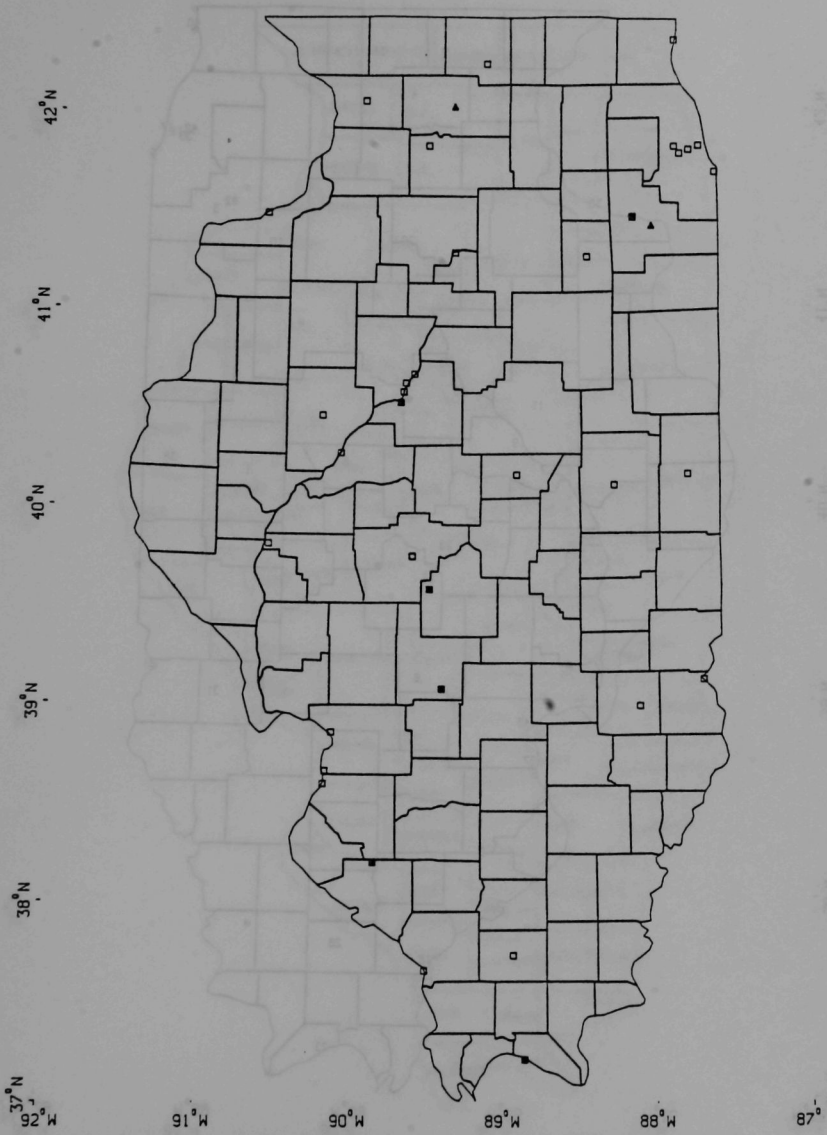


Fig. V.14. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

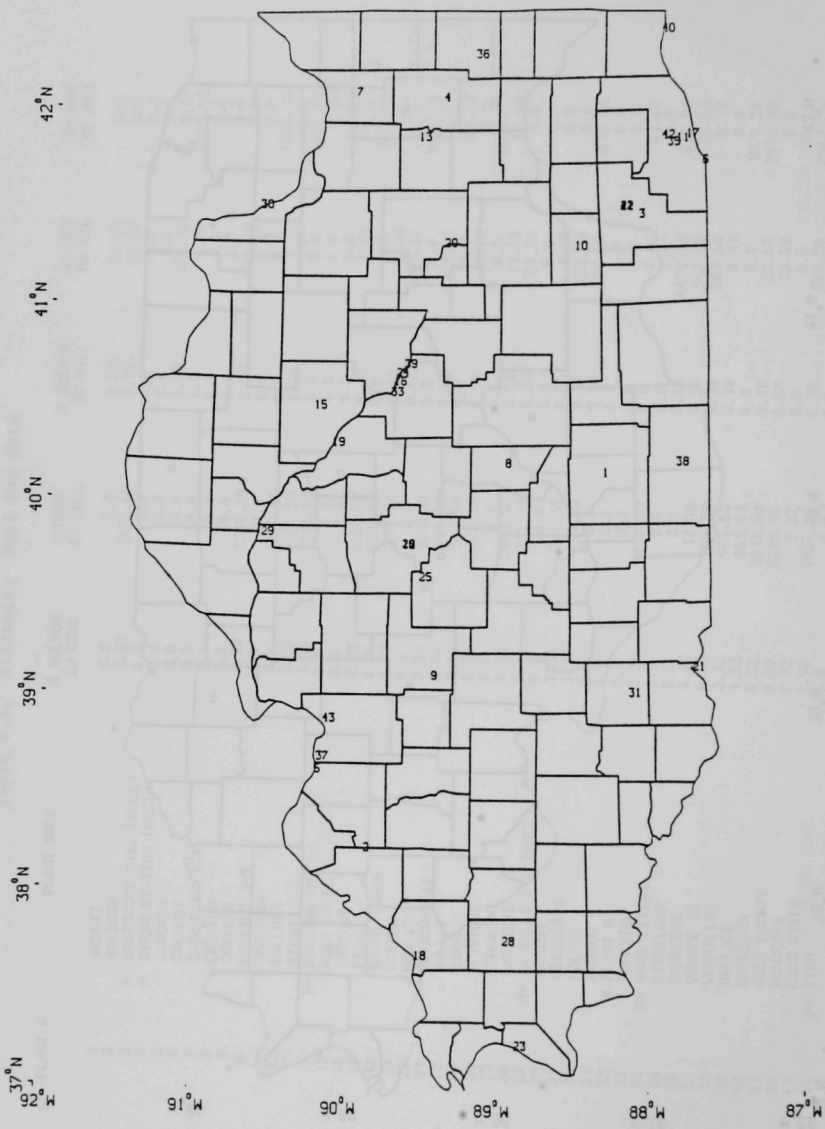


Fig. V.15. Power Plant Key (See Tables V.2 and V.3 for Identification and Fuel Use Data)

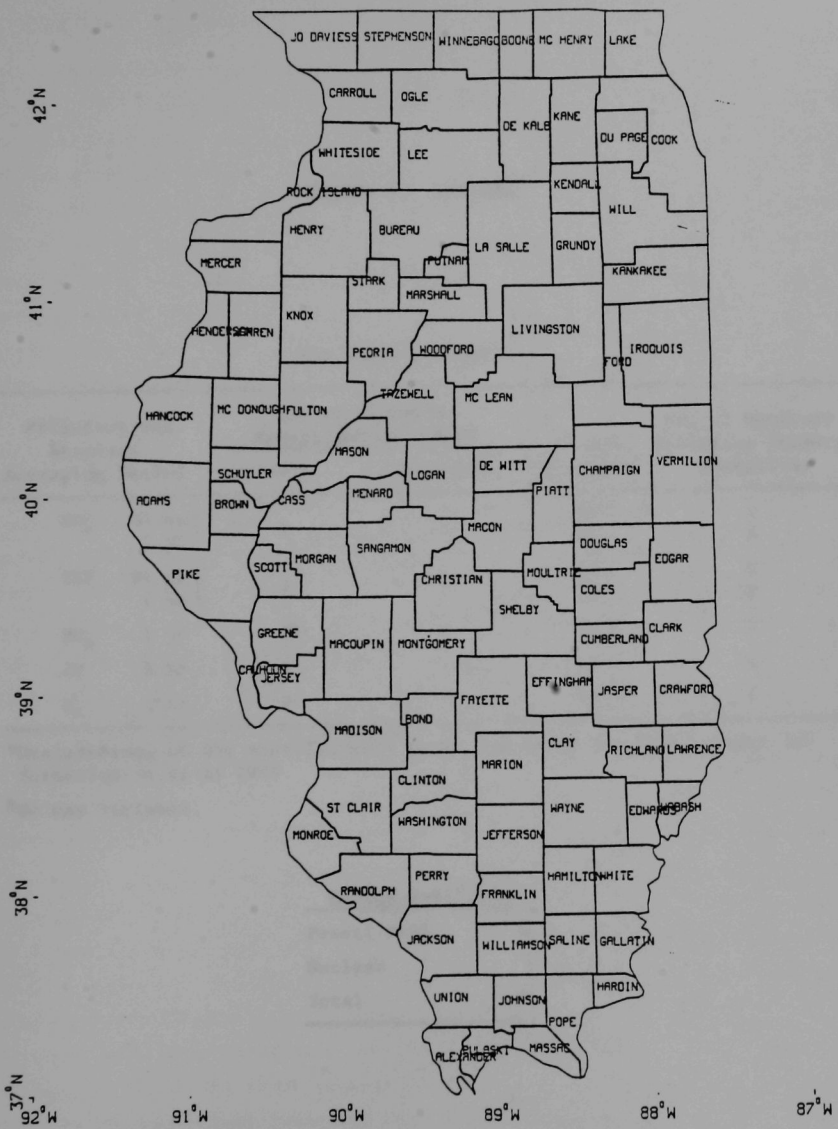


Fig. V.16. Illinois: Key to Counties

REGION V: INDIANA

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a] Primary	Secondary	No. of Monitors	No. of Monitors Recording Primary Violations
SO_2	24 hr	5	0	92	1
	1 yr			18	0
TSP	24 hr	7	5	117	2
	1 yr			70	23
NO_x	1 yr	0[b]	-	41	0
CO	8 hr	2	-	5	1
O_x	1 hr	6	-	12	7

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	29
Nuclear	1
Total	14

INDIANA: Draft SIP, 3/79

I. SOURCES OF THE PROBLEM

Indiana has designated parts of seven counties as nonattainment for primary TSP, and parts of three other counties as nonattainment for the secondary standard. In Clark County (adjacent to Louisville), 30-40% of the TSP found on samples was carbonaceous (coal, coke, soot) and 50-60% was dust from paved and unpaved roads, reflecting the presence of coal-fired utility and industrial boilers and resuspended road dust. In Dearborn County, coal combustion and ash handling at Tanners Creek power plant contribute to violations of NAAQS along with road dust. In Dubois County, wood processing and furniture manufacture are the major point sources, with agricultural operations and surface mining contributing to high background levels. Late submittal of the TSP plans for Lake County (Gary) and Marion County (Indianapolis) hampered analysis of those areas. Lake County is the steel manufacturing center, and both fugitive and the emissions from steel mills are significant factors. In both counties, fugitive dust from roads and construction sites hampers efforts to attain standards. The majority of particulates in Vigo County (Terre Haute) are dust from agriculture and roads, with some carbonaceous material and ash from boilers, open burning, and incineration. Wayne County has TSP sources similar to those in Vigo, with the addition of quarries, a power plant, coal piles, and foundries. In the areas failing to meet secondary NAAQS for TSP (parts of Howard, La Porte, St. Joseph and Vandenburgh counties), nontraditional fugitive sources contribute most of the particulate emissions, with contributions from industrial boilers in La Porte and St. Joseph counties and pollutant transport from Kentucky in Vandenburgh County.

Five counties contain areas not meeting NAAQS for SO_2. In Lake County, two coal-fired power plants, three major steel mills, and an oil refinery are the large point sources, and sulfuric acid plants and industrial boilers are smaller sources. Violations of NAAQS in LaPorte have been traced to the Indiana State Prison heating plant, with additional pollutants from the Michigan City power station. Marion County has almost thirty major point sources, of which the Stout generating station is the most significant. Modeling by the state that indicated that Ft. Benjamin Harrison, Detroit Diesel, National Starch and Chemicals, Bridgeport Brass, and Riley Tar boilers and

chemical processes were additional contributors to ambient air concentrations of SO_2. In Vigo County there are 17 major sources; the Wabash River and Dresser Station power plants are the largest. The Richmond Power and Light Co. plant causes violations in Wayne County.

Indiana has nine counties designated as nonattainment for O_x. Most of the ozone nonattainment is the result of motor vehicle emissions. Stationary sources of VOC include solvent degreasing, surface coating, gasoline and petroleum storage, and open burning. In Lake County, refineries, storage tanks, and metal coating and plating operations are the major stationary sources of VOC. The nonattainment areas of Lake-Porter and Clark-Floyd are heavily influenced by ozone transport from the major metropolitan centers of Chicago and Louisville, respectively. CO nonattainment in Lake County and Indianapolis (Marion County) is the result of vehicle emissions. There are currently no areas in violation of the NO_x standard.

II. ATTAINMENT STRATEGIES

A. SO_2

1. Lake County

a. Raise stacks as high as consistent with good engineering practice:

- NIPSCO plant
- Marblehead Lime
- American Maize

b. AMOCO is to use lower-sulfur oil

c. Youngstown, Inland, and U.S. Steel steel plants:

- desulfurize coke oven gas
- lower-sulfur fuels
- operate some boilers and processes below design rate

2. La Porte County

a. The stack for the state prison boiler is to be raised as high as consistent with good engineering practice

- alternative strategy: reduce emission limitation from 5.12 to 4.4 lb SO_2 per MM Btu
- stack height increase is the "least cost" option

3. Marion County

   a. State originally provided a strategy of:

      - using low-sulfur coal (or FGD) on two boilers of Indiana Power and Light Co.'s Stout generating plant, to reduce emissions to 1.23 lb SO_2 per MM Btu
      - FGD on 3 oil-fired boilers of Detroit Diesel Allison, to reduce emissions to 0.38 lb SO_2 per MM Btu
      - FGD on 4 oil-fired boilers at National Starch and Chemical, to reduce emissions to 2.05 lb of SO_2
      - use of natural gas for Reilly Tar & Chemical as an alternative fuel, given the intermittent use of boilers

   b. In March 1979, state revised strategy

      - increase IPALCO stack height as high as consistent with good engineering practice
      - control hours of operation of National Starch and Chemical
      - limit sulfur content of oil and coal for industrial boilers (Bridgeport Brass, Reilly Tar & Chemical)

4. Vigo County

   a. International Mineral & Chemical

      - 3 coal-fired boilers with fuel input <100 MM Btu/hr
      - emissions to be reduced from 4.75 to 2.47 lb SO_2 per MM Btu

   b. J.I. Case

      - 2 coal-fired boilers with fuel input <75 MM Btu/hr
      - emissions to be reduced from 4.74 to 4.22 lb SO_2 per MM Btu

   c. PSI's Wabash River Station

      - 6 coal-fired boilers, all > 250 MM Btu/hr
      - reduce emissions from 3.52 to 0.49 lb SO_2 per MM Btu

   d. PSI's Dresser generating station

      - 6 coal-fired boilers, all > 250 MM Btu/hr
      - reduce emissions from 7.53 to 2.85 lb SO_2 per MM Btu

e. Weston Paper

- 2 coal-and-wood boilers > 100 MM Btu/hr
- switching from coal and wood to coal and wood chips
- emissions allowed to increase from 2.50 lb SO_2 per MM Btu to 3.28

5. Wayne County

a. Raise stack at Richmond Power and Light plant as high as consistent with good engineering practice

b. Alternative: reduce emissions to 3.6 lb SO_2 per MM Btu

B. TSP

1. Lake County (Gary)

a. RACT already required for stationary sources

b. RACT for fugitive industrial emissions

c. Study, evaluate, and implement other fugitive dust control measures

2. Marion County (Indianapolis)

a. RACT for stationary sources already required

b. Ban on open burning

c. (a) and (b) inadequate for achieving attainment; will need fugitive dust controls; plan to develop measures delayed

3. Clark County

a. RACT already required on major point source

b. Develop control of fugitive emissions from coal handling

c. Develop other fugitive dust control measures

d. Cleanup of Louisville (Kentucky) sources

4. Dearborn County

a. Existing SIP emission limitations adequate to qualify as RACT

- boiler at Seagram's is to reduce emissions by 70%

b. Suppression of fugitive dust from vehicle re-entrainment

c. Control of fugitive coal-handling emissions at Tanner's Creek power plant

5. DuBois County

a. RACT for wood processing and furniture manufacture

- industrial boilers to reduce emissions
- reduction ranges from 50-90%
- emissions to be reduced to 0.2 - 0.7 lb PM per hr

b. Jasper Municipal Electric

- reduce emissions below present level of 43 lb PM per hr

c. Suppress fugitive dust to maintain attainment

6. Vigo County (Terre Haute)

a. Control point sources to reduce emissions

- Midland glass furnace
- Anaconda aluminum melter
- boilers at two colleges are to reduce emissions by 90%
- industrial boilers (with fuel input <50 MM Btu/hr) to achieve 90% reduction in PM emissions
- PSI Wabash Plant to reduce emissions an average of 25% (from 90 to 65 lb PM per hr)
- PSI Dresser plant is projected not to be in operation by 1985

b. Ban on open burning

c. Develop methods for suppressing fugitive road dust to meet secondary standards

7. Wayne County

a. Point source control

- reduce emissions from Richmond State Hospital boiler
- reduce emissions from Tool Co.'s industrial boiler by 60%

b. Projected continued decrease in coal use by small, uncontrolled industrial sources

c. Study and implement controls on fugitive dust from unpaved and paved roads

8. Howard County (late submittal to prepare fugitive dust study)

9. La Porte County

a. Secondary violation

b. RACT on point sources sufficient to achieve secondary standards

- Indiana State Prison boilers
- Allis Chalmers boilers
- no change for NIPSCO's Michigan City plant
- reduce dust from roads

10. Vanderburgh County

a. Plan submitted late to prepare study of fugitive dust controls

b. Cleanup of Henderson and Daviess counties, Kentucky, will reduce TSP levels in Vanderburgh

c. Secondary violations only

11. St. Joseph County

a. Secondary violations

b. Reduce emissions from small industrial boilers

c. Reduce use of coal by small industries

C. O_x

1. Allen and Vanderburgh Counties (Ft. Wayne and Evansville)

a. Probably already in attainment of new standard

b. FMVECP will assure attainment

c. RACT regulations for major stationary sources listed in EPA's control techniques guidances

2. St. Joseph County and Elkhart

a. FMVECP

b. RACT for major stationary sources listed in EPA's control techniques guidances

3. Gary, Indianapolis, and metropolitan Louisville

a. FMVECP

b. Inspection and maintenance of motor vehicles

c. Regulation 15, RACT for stationary sources listed in EPA's control techniques guidances:

- surface coating
- solvent metal cleaning
- petroleum refining and storage
- gasoline distribution
- cutback asphalt
- other organic solvent use

d. Transportation control measures

- to be developed area-by-area

e. Reduction of out-of-state transport of ozone from Illinois and Kentucky

D. CO

1. FMVECP
2. Vehicle inspection and maintenance
3. Transportation control measures aimed at reducing ozone will also reduce CO

III. NEW SOURCE REVIEW

Indiana will use an emission offset policy, requiring that each ton of pollutant added by new or modified sources be offset by a reduction of 1.1 tons of pollutant from existing sources. Excess emission reductions may be "banked," unless use of banked emissions would interfere with reasonable further progress towards attainment. There is a five-year limit on banking.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. All existing sources with the potential to produce more than 25 tons per year of emissions to be reviewed

   a. Maximum emissions set at 6.0 lb SO_2 per MM Btu

   b. Emission limitation to be set for individual sources by state as necessary to prevent non-attainment, or exceeding the PSD increment

2. New sources with fuel input >250 MM Btu/hr: NSPS

B. TSP

1. All existing sources with the potential to emit more than 25 tons per year of PM to be reviewed

2. In the Lake and Porter counties portion of the Chicago Metropolitan AQCR and in the Metropolitan Indianapolis AQCR

   a. Sources with fuel input <10 MM Btu/hr: 0.6 lb PM per MM Btu

   b. Sources with fuel input >10,000 MM Btu/hr: 0.2 lb PM per MM Btu

3. Elsewhere in the state

   a. Limits calculated by ASME standard APS.1, with maximum of 0.8 lb PM per MM Btu

4. New sources with fuel input >250 MM Btu/hr: NSPS

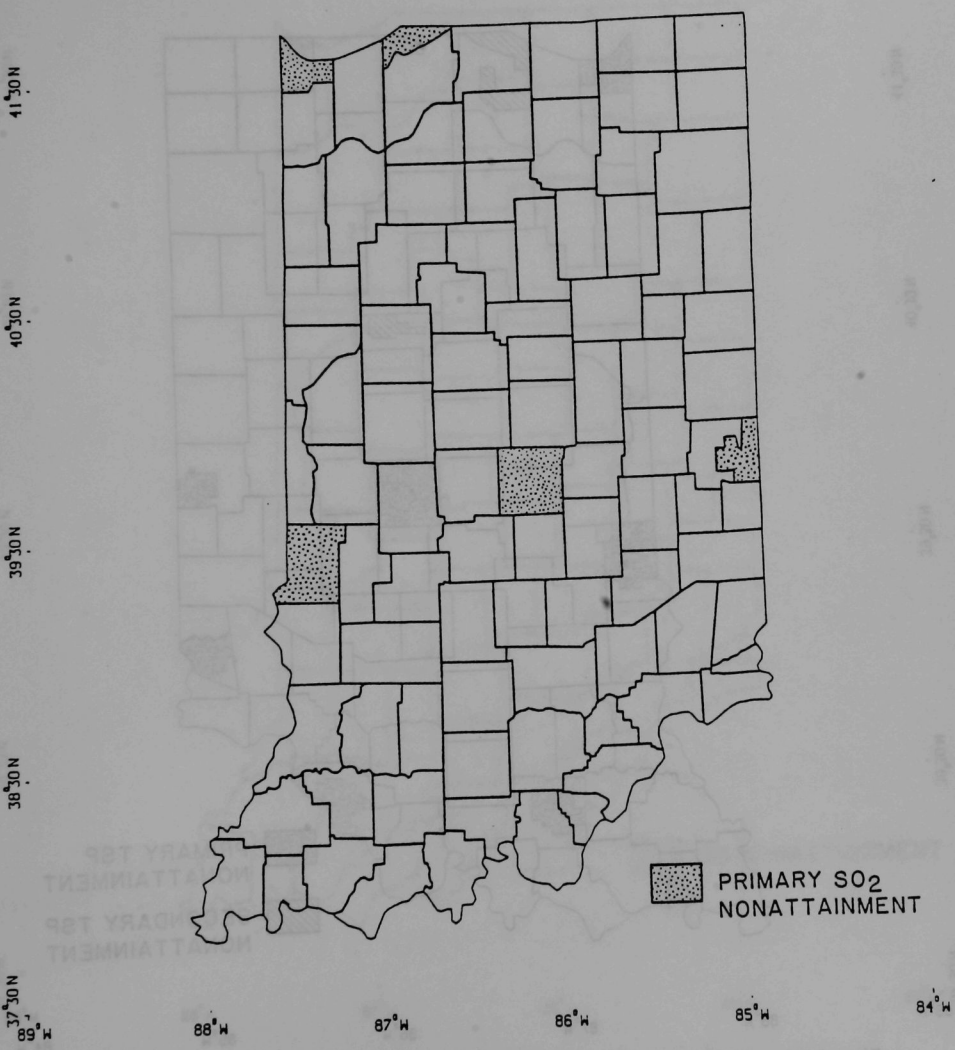


Fig. V.17. Indiana: SO_2 Nonattainment Areas as Designated May 1979

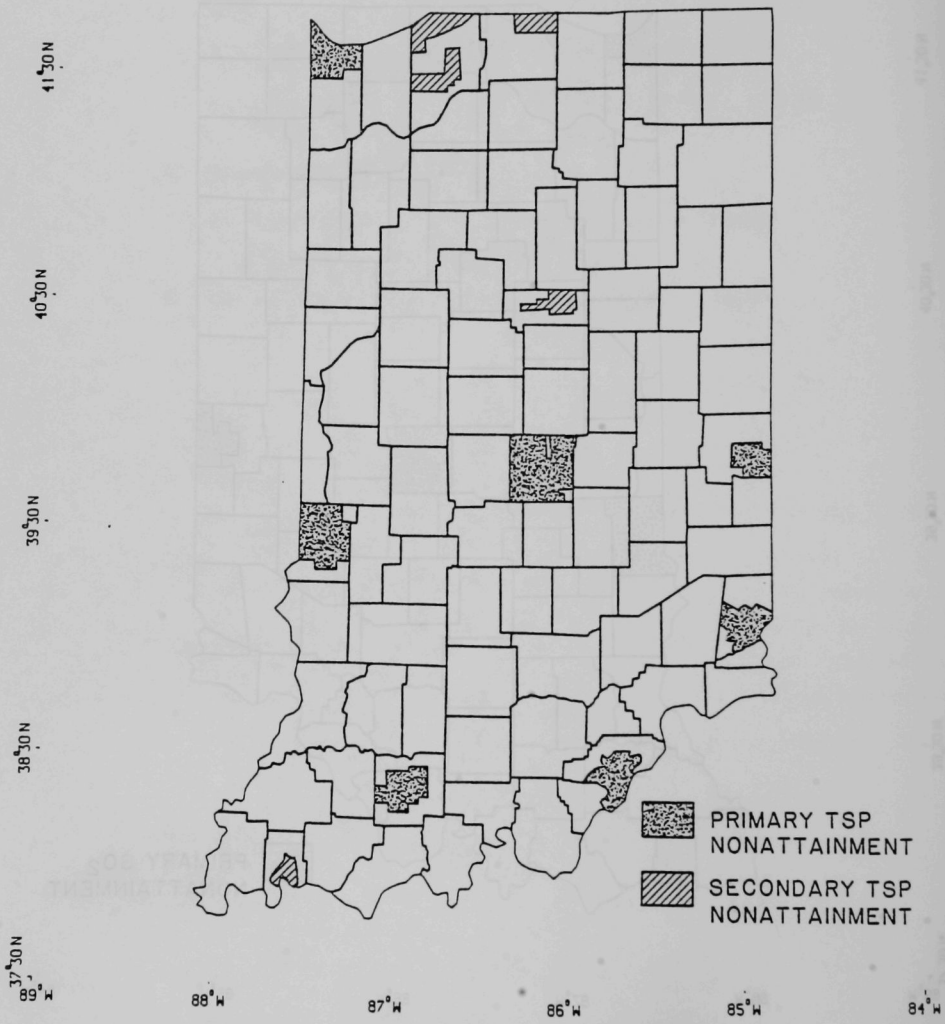


Fig. V.18. Indiana: TSP Nonattainment Areas as Designated May 1979

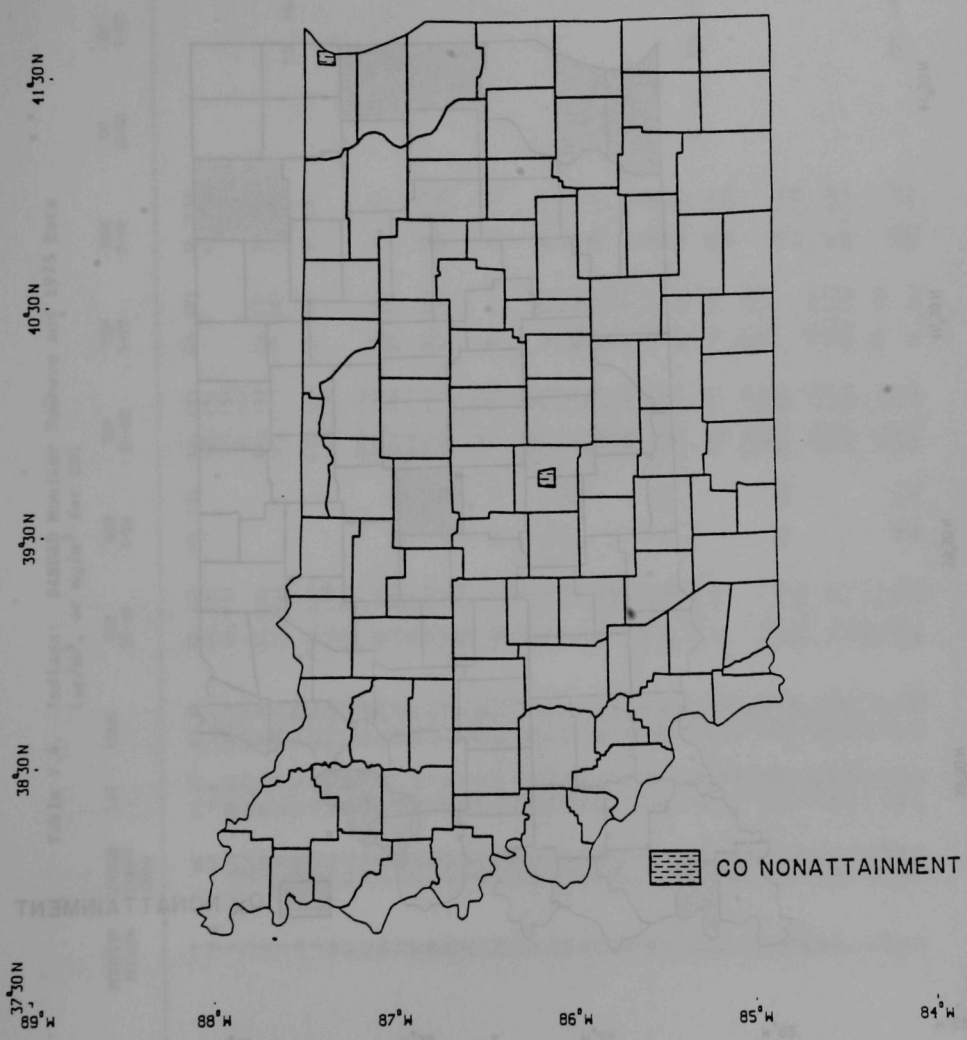


Fig. V.19. Indiana: CO Nonattainment Areas as Designated May 1979

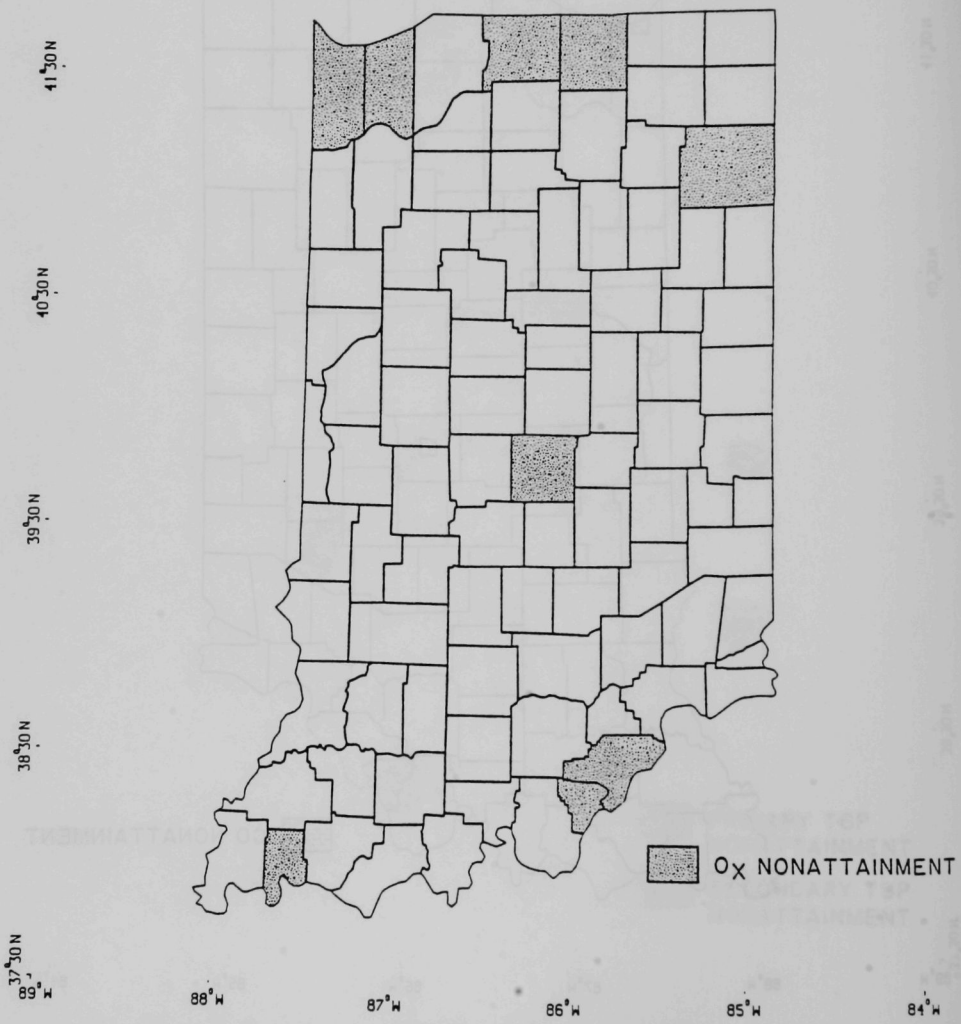


Fig. V.20. Indiana: O_x Nonattainment Areas as Designated May 1979

Table V.4. Indiana: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	60	41.07	85.13	63. (1)	22. (1)	114. (1)	62. (2)	44. (1)		
2 *	60	0.0	0.0	44. (1)		103. (1)		41. (1)		
4	220	39.21	85.89	65. (1)		85. (1)				
5	220	39.21	85.89			90. (1)				
6	700	38.44	85.66	61. (1)		110. (1)	55. (1)	31. (1)		
7	700	38.28	85.74	74. (1)		173. (1)	79. (3)	51. (1)		
8	1000	39.09	84.86							314. (4)
9	1000	39.09	84.86	115. (1)		210. (2)	76. (3)	29. (1)		
10	1000	39.09	84.86	13. (1)		49. (1)				
11	1100	40.19	85.37	112. (1)						
12	1100	40.19	85.38			100. (1)				
14	1120	38.39	86.93	125. (1)		127. (1)	75. (2)	30. (1)		
15	1260	41.69	85.99	73. (1)	21. (1)	121. (1)	51. (1)			
17	1360	38.28	85.83	30. (1)		144. (1)				
20	1600	40.56	85.66	81. (1)	17. (1)	116. (1)	56. (1)	32. (1)		
21	1960	40.50	86.13	52. (1)	18. (1)	102. (1)	57. (2)	33. (1)		
22	1960	40.48	86.14	82. (1)						
24	2100	41.19	87.03			66. (1)				
25	2100	40.74	87.15	58. (1)	17. (1)	77. (1)	39. (1)	17. (1)		
26	2100	41.19	87.03	68. (1)						
28	2100	41.14	86.99	76. (1)		86. (1)				
29	2140	38.75	85.40	56. (1)	18. (1)	103. (1)	40. (1)	23. (1)		
30	2260	38.70	87.53	42. (1)	17. (1)	128. (1)	65. (2)	30. (1)		
31	2360	41.67	87.49	68. (1)		206. (2)	102. (4)	40. (1)		
33	2360	41.39	87.35	21. (1)		125. (1)	48. (1)	26. (1)		
34	2360	41.64	87.46	9. (1)		173. (1)	84. (3)			
35	2360	41.64	87.47	80. (1)		330. (4)	117. (4)	54. (1)		
36	2360	41.66	87.47	57. (1)		257. (2)	99. (4)	50. (1)		
37	2360	41.63	87.48	130. (1)	64. (2)	184. (1)		57. (1)		
38	2360	41.64	87.49	52. (1)		194. (1)	90. (3)	55. (1)		
40	2360	41.63	87.46	139. (1)					3. (1)	108. (1)
41	2360	41.61	87.49	21. (1)		190. (1)	78. (3)	34. (1)		
42	2360	41.64	87.46					35. (1)		
44 *	2360	0.0	0.0			215. (2)	82. (3)			
46	2360	41.59	87.41			181. (1)	80. (3)			
47	2360	41.60	87.33	97. (1)	32. (1)	220. (2)		48. (1)		
48 *	2360	0.0	0.0	171. (1)				57. (1)		
49	2360	41.65	87.52			170. (1)	75. (2)			
50	2360	41.60	87.45	46. (1)		181. (1)	77. (3)	49. (1)		
51	2360	41.68	87.51	33. (1)		217. (2)	100. (4)	47. (1)		
52	2360	41.59	87.47	100. (1)						
53	2360	41.59	87.47	49. (1)		165. (1)	59. (2)			
54	2360	41.60	87.51	374. (3)	45. (1)	145. (1)		57. (1)		221. (4)
56	2360	41.62	87.52	105. (1)	40. (1)	145. (1)	82. (3)	58. (1)		

Table V.4. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
57	2360	41.62	87.52	61. (1)		179. (1)	78. (3)	44. (1)		
58	2360	41.60	87.33	39. (1)		230. (2)				
59	2360	41.60	87.33	29. (1)		117. (1)				
60	2360	41.59	87.33	178. (1)						
61	2360	41.57	87.34	9. (1)		121. (1)				
62	2360	41.60	87.26			116. (1)				
63	2360	41.59	87.31	24. (1)		173. (1)	71. (2)	43. (1)		
64	2360	41.59	87.32	26. (1)		182. (1)				
65	2360	41.53	87.33	79. (1)		139. (1)				
66	2360	41.61	87.26	32. (1)		108. (1)	50. (1)	53. (1)		
67	2360	41.60	87.35	3. (1)		370. (4)				
68 *	2360	0.0	0.0	11. (1)		258. (2)	79. (3)	59. (1)		
69	2360	41.59	87.41	13. (1)				50. (1)		
70	2360	41.64	87.50	315. (2)						
71	2360	41.65	87.52	57. (1)				41. (1)		
72	2400	41.61	86.72	12. (1)		183. (1)				
73	2600	40.09	85.63			73. (1)				
74	2600	40.09	85.72			94. (1)				
75	2600	40.07	85.69			89. (1)				
76	2600	40.13	85.68			75. (1)				
77	2600	40.11	85.67			60. (1)				
78	2600	40.11	85.67	66. (1)	24. (1)	115. (1)	65. (2)	38. (1)		
79	2600	40.09	85.67			66. (1)				
81	2640	39.77	86.13							331. (4)
82	2640	39.65	86.28							290. (4)
84 *	2640	0.0	0.0							276. (4)
86	2640	39.65	86.25	3. (1)					17. (4)	
87	2640	39.78	86.16							245. (4)
88 *	2640	0.0	0.0						9. (2)	
89 *	2640	0.0	0.0						6. (1)	235. (4)
90	2640	39.77	86.13	155. (1)						
91	2640	39.78	86.18	198. (1)						
92	2640	39.74	86.23	127. (1)						
93	2640	39.63	86.01	87. (1)		97. (1)	44. (1)			
94	2640	39.82	86.25							110. (1)
96	2640	39.78	86.16	308. (2)		180. (1)				
97	2640	39.77	86.15	63. (1)		90. (1)				
98	2640	39.77	86.15	150. (1)		141. (1)	81. (3)			
99	2640	39.78	86.19	119. (1)		147. (1)	83. (3)			
100	2640	39.84	86.14	121. (1)		120. (1)	67. (2)			
101	2640	39.77	86.06	176. (1)		151. (1)	76. (3)			
102 *	2640	0.0	0.0							129. (2)
103	2640	39.74	86.17	151. (1)		161. (1)	83. (3)			
105	2640	39.76	86.18	253. (1)		248. (2)				127. (2)
106	2640	39.76	86.18	103. (1)						
107	2640	39.85	86.23			149. (1)	50. (1)			

Table V.4. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
108	2640	39.85	86.05			134. (1)	56. (1)			
109	2640	39.69	86.27			155. (1)	75. (2)			
110	2640	39.77	86.19	163. (1)	31. (1)	163. (1)		40. (1)		
111	2640	39.74	86.23	118. (1)		197. (2)	84. (3)			
112	2640	39.78	86.25			135. (1)	66. (2)			
113	2640	39.73	86.28	83. (1)		109. (1)	62. (2)			
114	2640	39.77	86.13			176. (1)	92. (3)			
115	2800	39.31	86.42	21. (1)		84. (1)				
117	2800	39.17	86.54	71. (1)	19. (1)	109. (1)	58. (2)	43. (1)		
119	3260	39.89	87.20			61. (1)				
120	3420	41.68	86.99			87. (1)				
121	3420	41.62	87.19			105. (1)				
122 *	3420	44.36	87.10			105. (1)				
123	3420	41.35	87.04	66. (1)		36. (1)				
124	3420	41.29	86.95	64. (1)		32. (1)				
125	3420	41.62	87.11	66. (1)		36. (1)				
126	3420	41.54	87.14	78. (1)		86. (1)				
127	3420	41.39	87.03			80. (1)				
128	3420	41.62	87.19	40. (1)						
129	3420	41.62	87.06	77. (1)		95. (1)				
130	3420	41.44	86.93			67. (1)				
131	3420	41.51	87.04	31. (1)		177. (1)				
132	3700	41.68	86.25			152. (1)	67. (2)			
133	3700	41.67	86.25			161. (1)	76. (3)			
134	3700	41.64	86.25			115. (1)	46. (1)			
135	3700	41.69	86.27			117. (1)	52. (1)			
136	3700	41.70	86.24			129. (1)	49. (1)			
137	3700	41.67	86.25	41. (1)		106. (1)	63. (2)			
139	3700	41.74	86.38			108. (1)	37. (1)			
140 *	3700	0.0	0.0	52. (1)	19. (1)	137. (1)	54. (1)	38. (1)		
141	3700	41.66	86.18	47. (1)		63. (1)				
142	3700	41.66	86.20			131. (1)	64. (2)			
143	3700	41.66	86.14			103. (1)	53. (1)			
144	3980	41.71	85.00	84. (1)	19. (1)	165. (1)	45. (1)	17. (1)		
145	4100	40.42	86.89	55. (1)		158. (1)	66. (2)			
146	4220	37.94	87.68	84. (1)		97. (1)	42. (1)			
147	4220	37.97	87.53			89. (1)				
148	4220	37.99	87.65			87. (1)				
149	4220	37.97	87.57						9. (2)	66. (1)
152	4220	37.97	87.57	88. (1)	24. (1)	120. (1)	54. (1)	46. (1)		
153	4220	37.97	87.57			131. (1)				
154	4220	37.97	87.57	39. (1)		115. (1)	59. (2)	30. (1)		
155	4220	38.00	87.55			139. (1)	60. (2)			

Table V.4. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
156	4220	38.00	87.60			125. (1)	50. (1)			
159	4260	39.50	87.26			141. (1)				
160	4260	39.37	87.47			140. (1)	72. (2)			
161	4260	39.50	87.45			135. (1)	72. (2)			
162	4260	39.47	87.41	98. (1)						
163	4260	39.47	87.42			120. (1)	68. (2)			
165	4260	39.44	87.38			142. (1)	79. (3)			
166	4260	39.81	87.39			122. (1)	70. (2)			
167	4260	39.47	87.40			138. (1)	70. (2)			
168	4260	39.47	87.40	74. (1)	15. (1)					
169	4260	39.45	87.41	12. (1)						
171	4440	39.83	84.87	50. (1)		111. (1)	56. (1)	31. (1)		
172	4440	39.83	84.89	69. (1)		150. (1)	67. (2)	37. (1)		
173	4440	39.83	84.91	63. (1)		140. (1)	60. (2)	29. (1)		

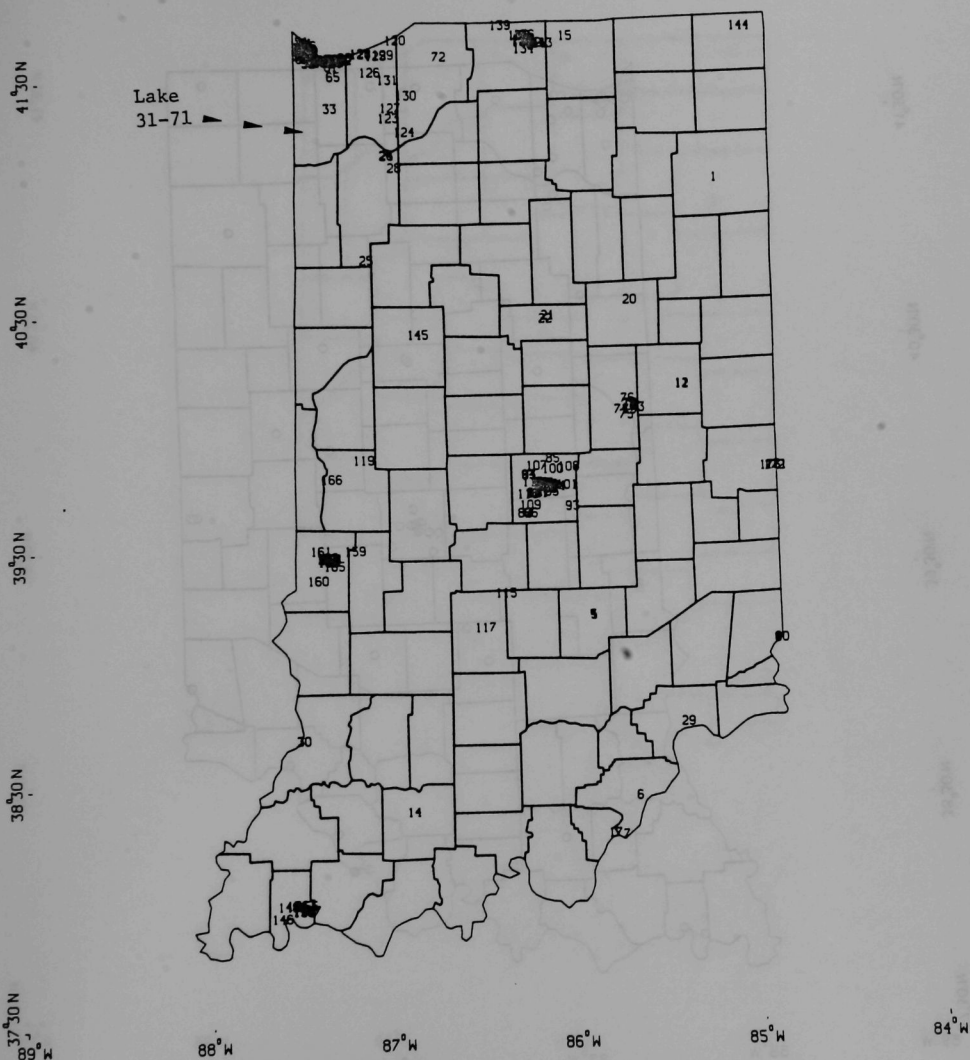


Fig. V.21. Indiana: Locations of SAROAD Monitors
(See Table V.4 for Monitor Numbers)

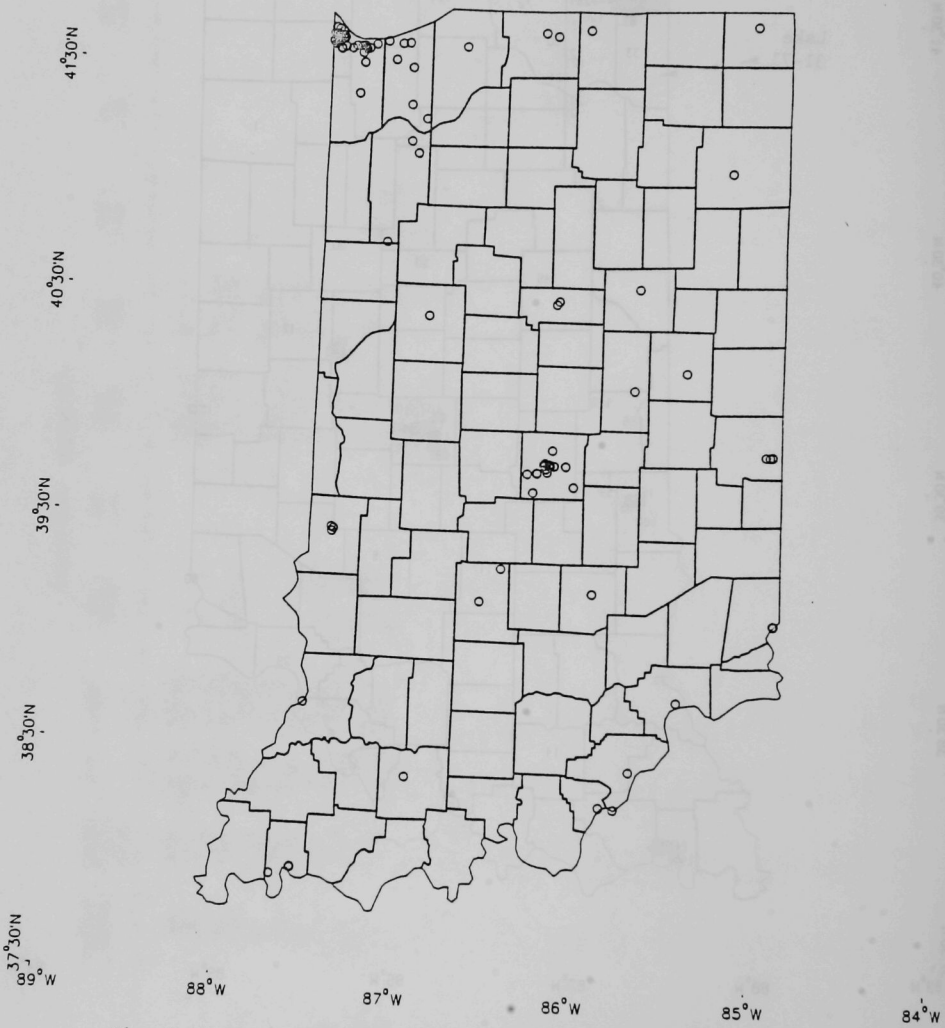


Fig. V.22. Indiana: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

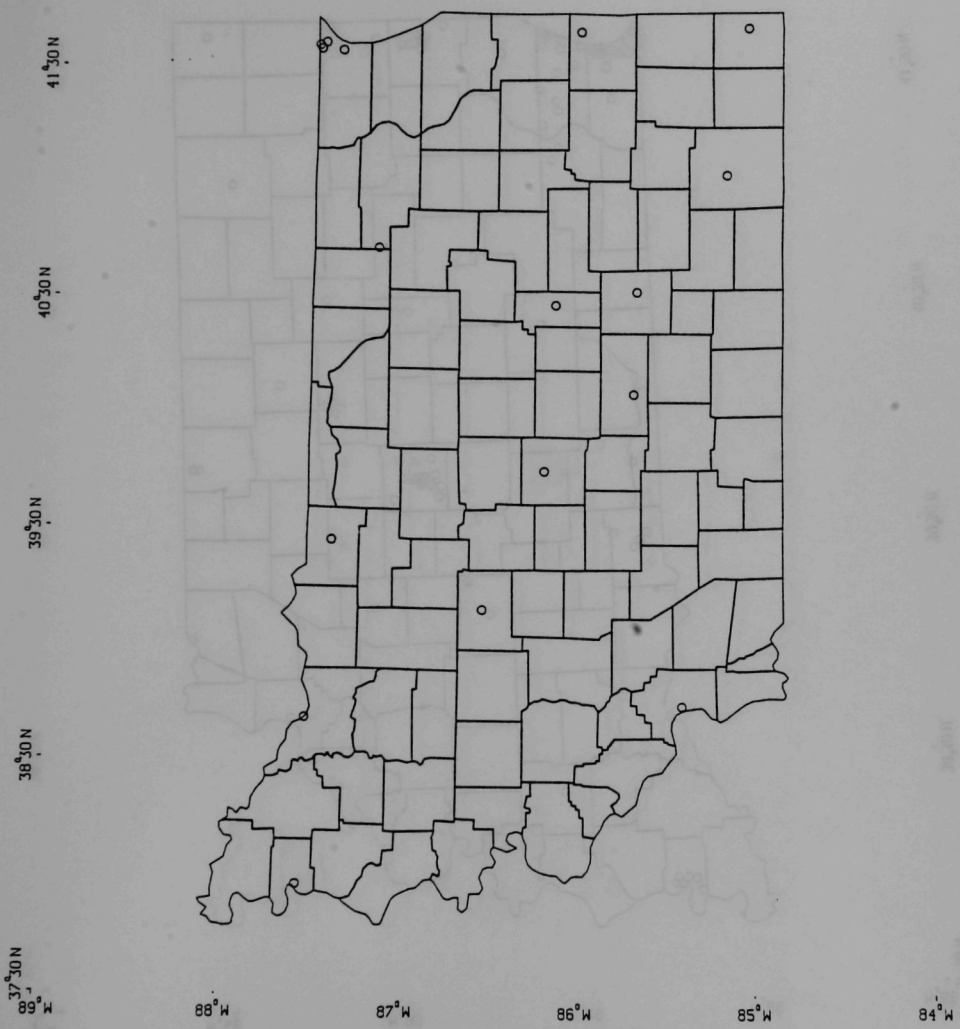


Fig. V.23. Indiana: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

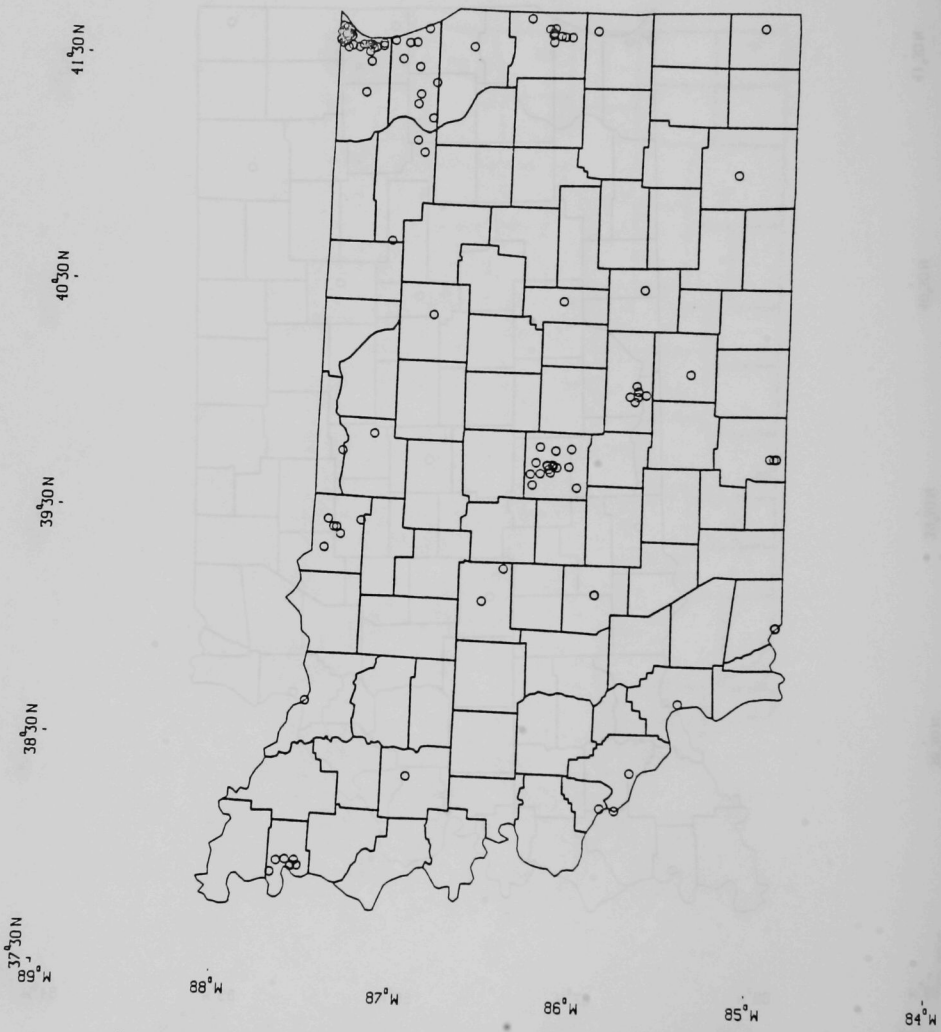


Fig. V.24. Indiana: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

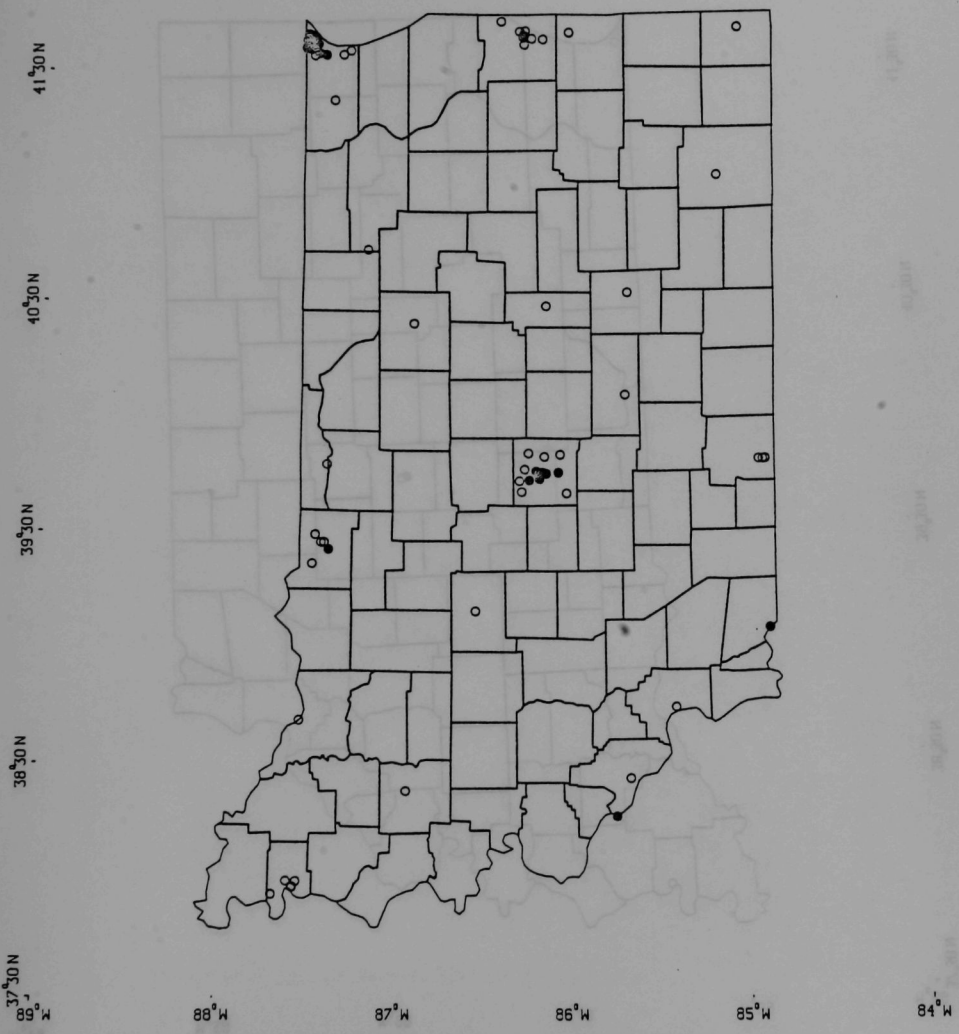


Fig. V.25. Indiana: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

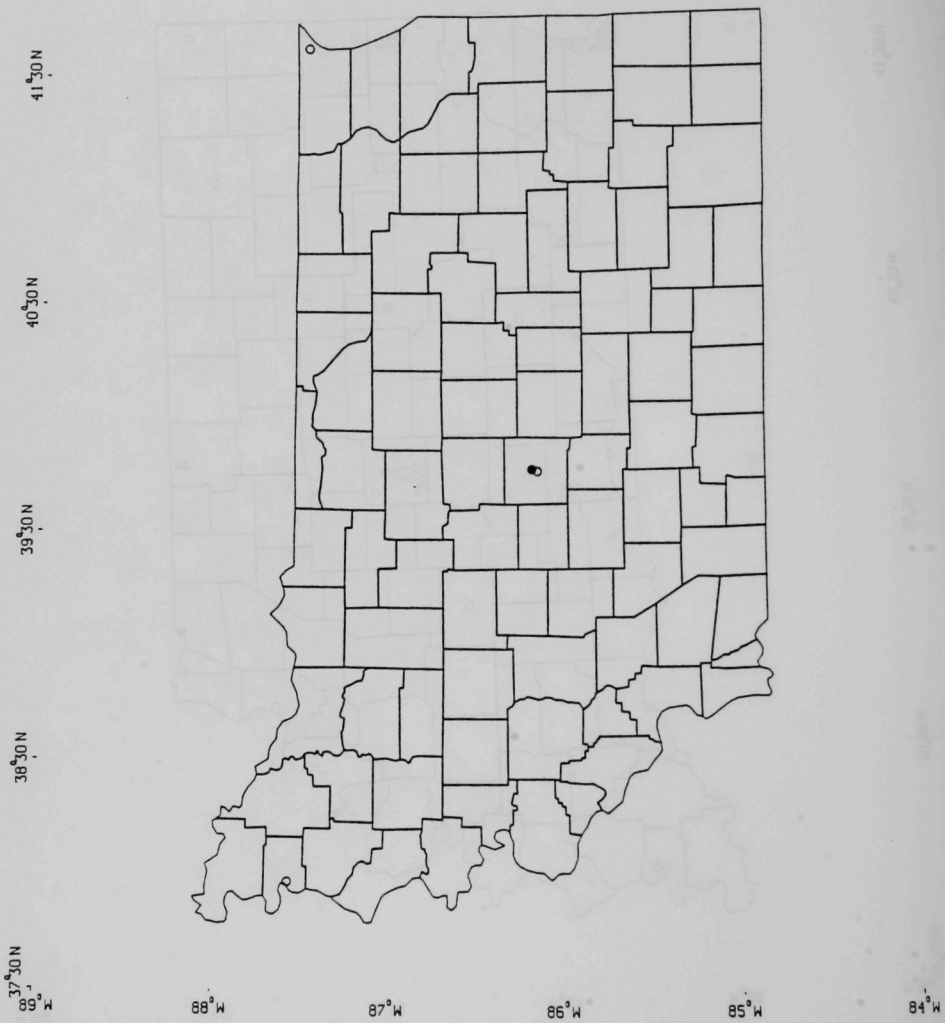


Fig. V.26. Indiana: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

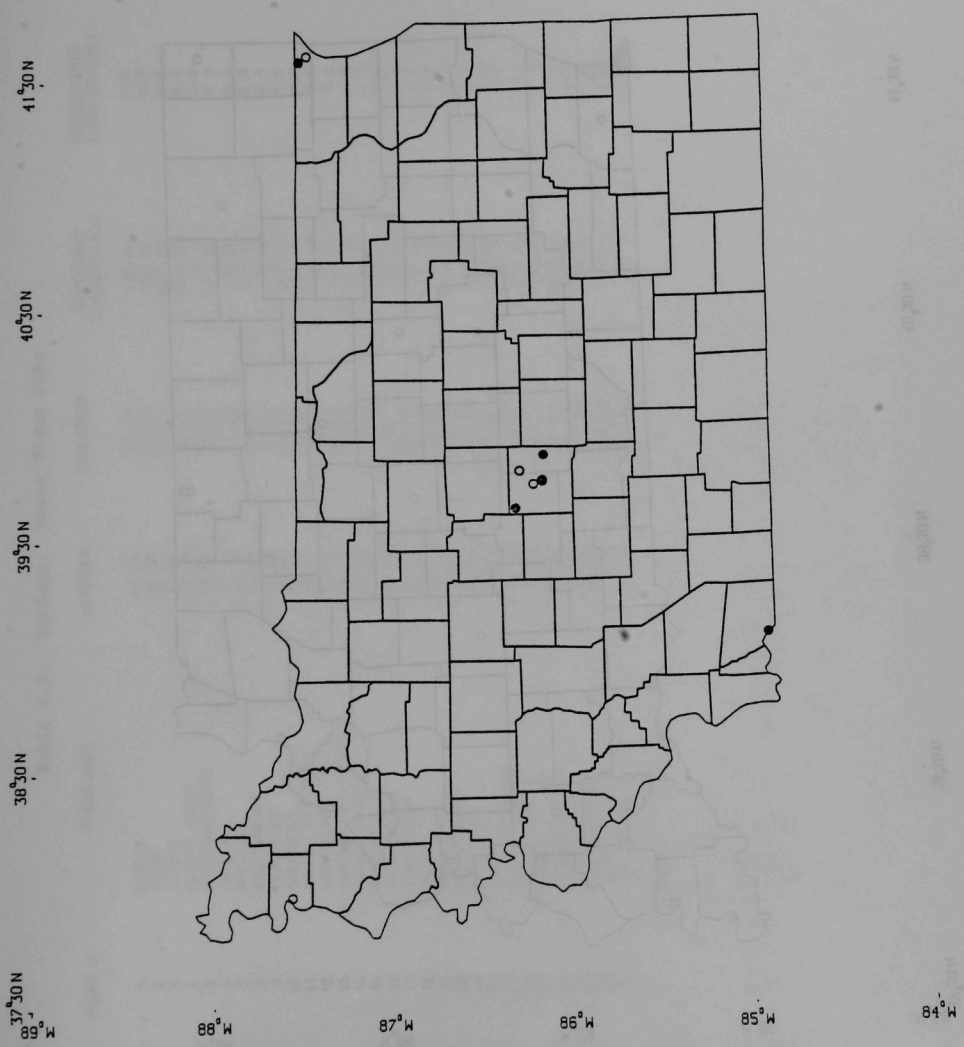


Fig. V.27. Indiana: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

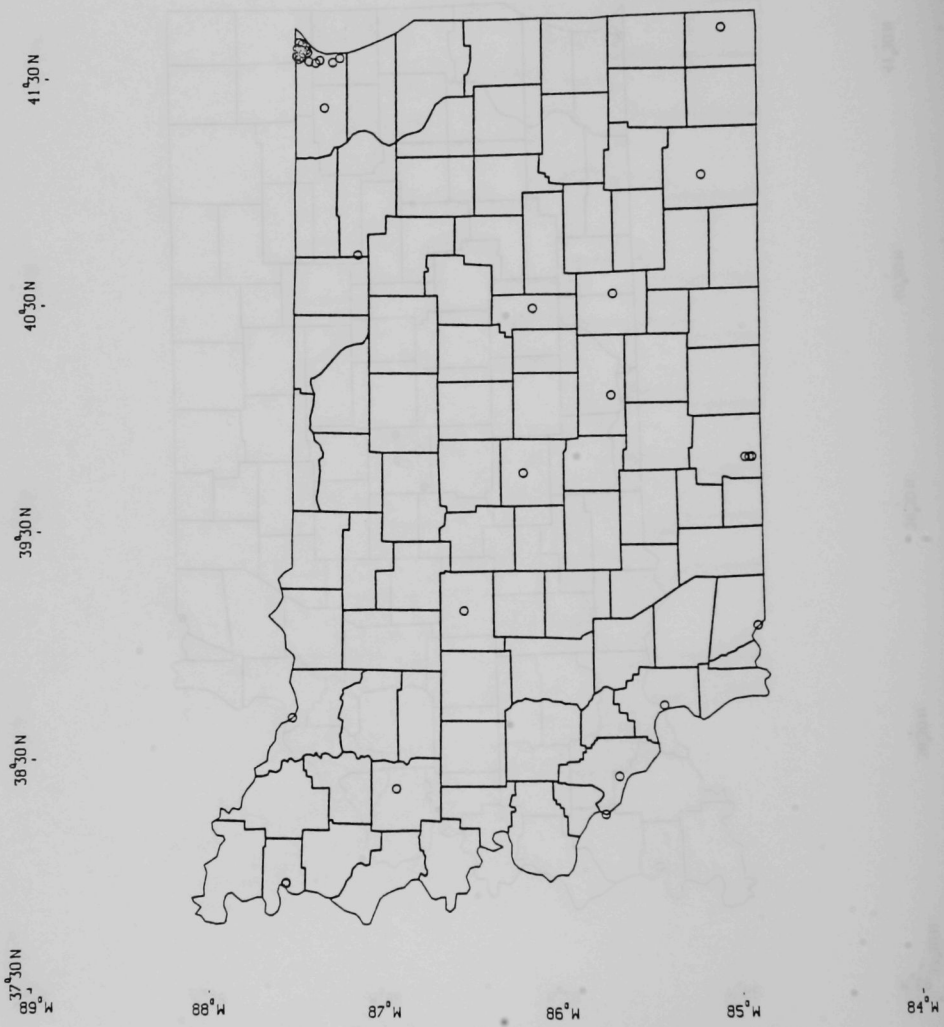


Fig. V.28. Indiana: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table V.5. Indiana: Power Plant Data

PLANT #	PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1	BAILLY	41.64	87.12	615.60	0.0
2	BREED	39.23	87.57	450.00	0.0
3	CAYUGA	39.93	87.43	1062.00	0.0
4	CLIFTY CREEK	38.74	85.42	1304.00	0.0
5	CRAWFORDSVILLE	40.03	86.91	35.15	0.0
6	CULLEY	37.91	87.33	414.93	0.0
7	DRESSER	39.40	87.49	150.00	0.0
8	EDWARDSPORT	38.81	87.25	144.00	0.0
9	FRANKFORT	40.28	86.52	32.50	0.0
10	GALLAGHER	38.26	85.84	600.00	0.0
11	GIBSON STATION	38.32	87.58	650.00	0.0
12	LOGANSPORT	40.76	86.37	55.00	0.0
13	N MARBLE HILL (NUCL)	38.79	85.44	65.00	0.0
14	MICHIGAN CITY	41.72	86.91	736.00	0.0
15	MITCHELL	41.64	87.41	529.40	0.0
16	NOBLESVILLE	40.10	85.97	100.00	0.0
17	OHIO RIVER	37.97	87.60	121.50	0.0
18	PERRY	39.76	86.17	47.50	0.0
19	PERU	40.77	86.08	37.00	0.0
20	PETERSBURG	38.53	87.25	724.44	0.0
21	PRITCHARD	39.49	86.42	393.64	0.0
22	RATTS	38.52	87.27	233.20	0.0
23	R.M. SCHAHFER	41.02	87.11	44.00	0.0
24	STATE LINE	41.71	87.52	972.00	0.0
25	STOUT	39.71	86.20	934.76	0.0
26	TANNERS CREEK	39.08	84.86	1098.00	0.0
27	TWIN BRANCH	41.67	86.13	252.50	0.0
28	WABASH RIVER	39.53	87.42	962.00	0.0
29	WARRICK	37.91	87.33	731.00	0.0
30	WHITEWATER	39.80	84.90	93.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.6. Indiana: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	BAILLY	3.61	1152.43	0.0	0.0	2667.02
2	BREED	3.90	893.70	0.10	3.90	0.0
3	CAYUGA	2.23	2601.00	0.31	34.40	0.0
4	CLIFTY CREEK	3.44	4209.00	0.0	0.0	0.0
5	CRAWFORDSVILLE	3.57	76.18	0.0	0.0	0.0
6	CULLEY	3.70	1184.10	0.10	0.60	3.20
7	DRESSER	4.10	84.00	0.29	13.10	0.0
8	EDWARDSPORT	2.33	229.00	0.31	75.30	0.0
9	FRANKFORT	2.90	43.30	0.10	0.50	10.27
10	GALLAGHER	3.29	1379.00	0.31	66.20	0.0
11	GIBSON STATION	2.02	1029.00	0.31	37.20	0.0
12	LOGANSPORT	1.30	70.80	0.10	20.85	0.0
13	N MARBLE HILL (NUCL)	0.0	0.0	0.0	0.0	0.0
14	MICHIGAN CITY	2.91	1249.79	0.0	0.0	4836.68
15	MITCHELL	0.62	1322.20	0.0	0.0	2743.08
16	NOBLESVILLE	2.81	132.60	0.31	3.20	0.0
17	OHIO RIVER	0.0	0.0	0.50	57.90	34.70
18	PERRY	3.18	43.00	0.30	3.60	46.00
19	PERU	3.26	47.00	0.0	0.0	0.0
20	PETERSBURG	3.15	1714.40	0.30	14.80	0.0
21	PRITCHARD	2.66	602.40	0.30	13.70	0.0
22	RATTS	3.54	655.30	0.20	2.40	0.0
23	R.M. SCHAHFER	0.0	0.0	0.0	0.0	0.0
24	STATE LINE	1.11	2217.00	0.0	0.0	103.10
25	STOUT	2.63	1716.60	0.30	49.00	0.0
26	TANNERS CREEK	3.71	2108.70	0.10	61.50	0.0
27	THIN BRANCH	0.0	0.0	0.10	937.30	0.0
28	WABASH RIVER	2.79	1855.00	0.31	47.20	0.0
29	WARRICK	3.48	2181.10	0.10	3.40	11.20
30	WHITEWATER	2.92	178.00	1.00	0.61	0.0

N NUCLEAR * NOT PLOTTED

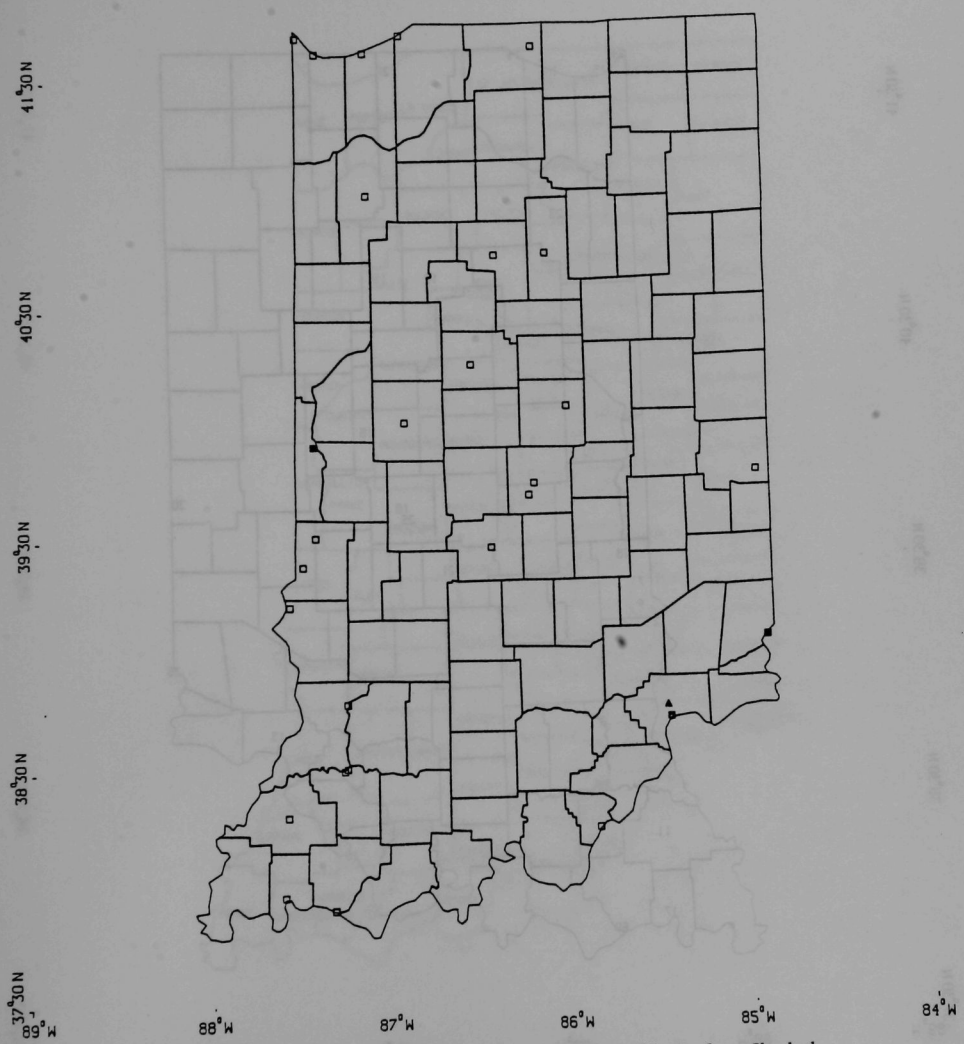


Fig. V.27. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

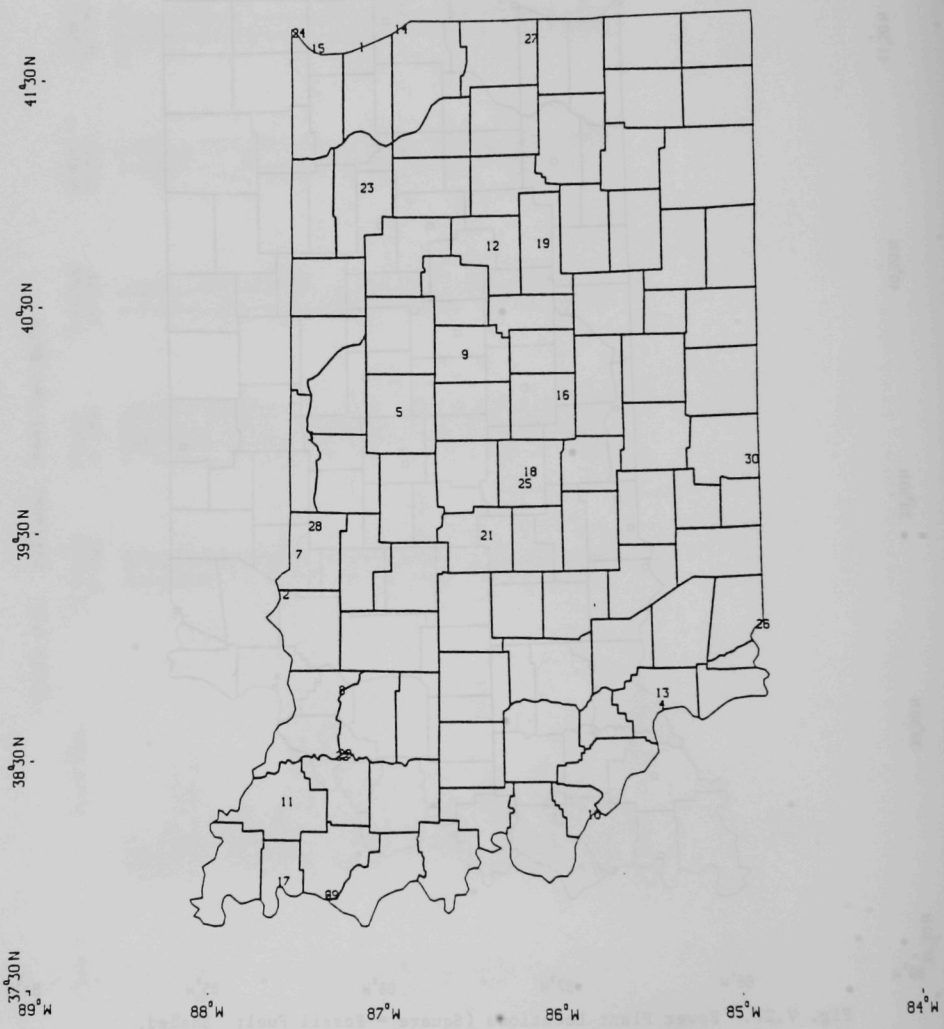


Fig. V.28. Power Plant Key (See Tables V.5 and V.6 for Identification and Fuel Use Data)

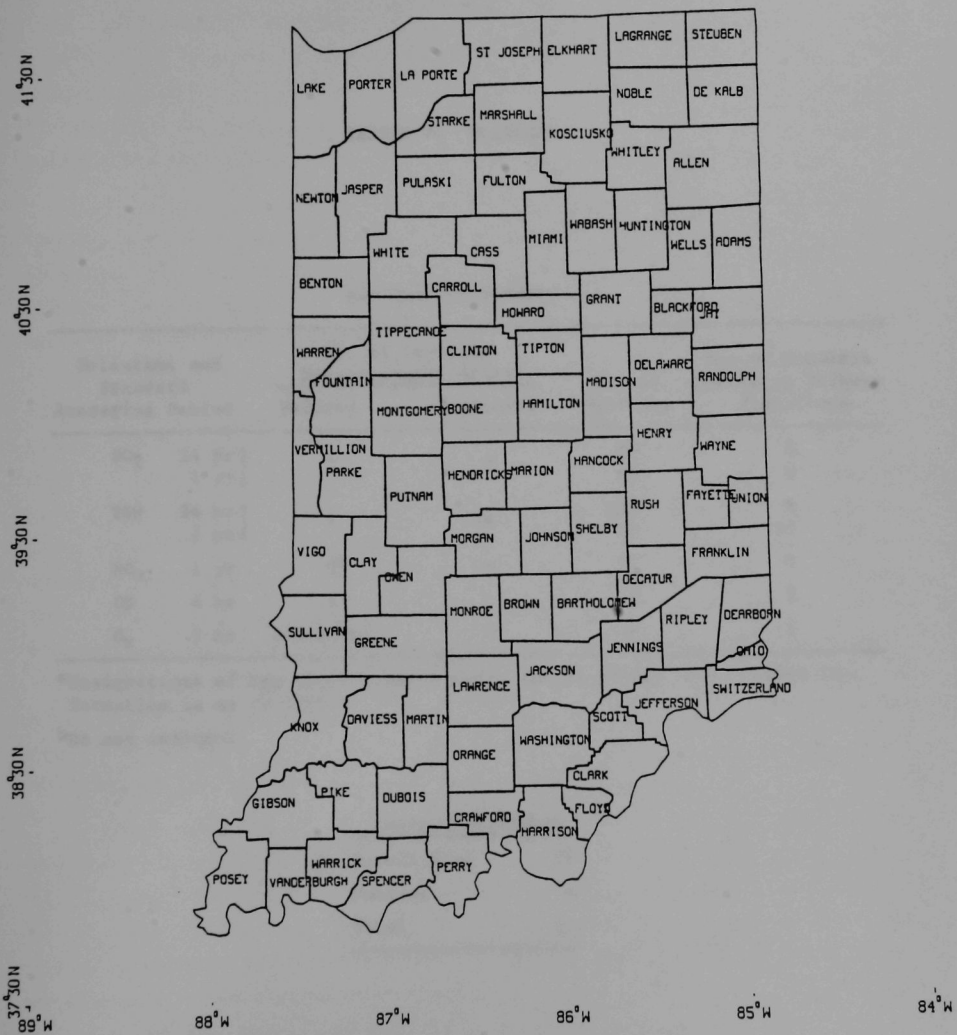


Fig. V.29. Indiana: Key to Counties

REGION V: MICHIGAN

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a]		No. of Monitors	No. of Monitors Recording Primary Violations
		Primary	Secondary		
SO_2	24 hr	2	0	57	3
	1 yr			44	0
TSP	24 hr	4	16	139	4
	1 yr			98	10
NO_x	1 yr	0[b]	-	23	0
CO	8 hr	2	-	9	2
O_x	1 hr	1/2 state	-	4	3

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	29
Nuclear	4
Total	33

MICHIGAN: Official SIP, 5/79

I. SOURCES OF THE PROBLEMS

Two areas of Michigan have been designated nonattainment for sulfur dioxide, not because of air quality readings but because of the use of prohibited supplementary control systems to achieve primary SO_2 NAAQS. In Midland, the source is Dow Chemical industrial boilers, and in Ingham County it is the Lansing Board of Water and Light Power Station.

In three of the four areas designated as nonattainment for particulates (Flint, Saginaw, and Albion) flue emissions and fugitive industrial process emissions from foundries used in automobile manufacture cause violations of primary TSP standards. In Detroit the origins of TSP nonattainment are more diverse. Point sources contributed 48%, areas sources (including nontraditional fugitive dust) 45%, and fugitive industrial emissions approximately 7% of estimated emissions in 1975. Although power plants were the largest single category of point source emitters, point and fugitive emissions from automobile manufacture plus PM from resuspended road dust, tailpipe emissions, tire fragments, and other fugitive automobile sources outweighed the power plant contribution to TSP levels. In the 16 secondary nonattainment areas, fugitive dust from paved and unpaved roads is believed to be a significant cause of violations, although further study will be required because of modeling inadequacies. In some specific instances, power plant emissions (Marquette, Monroe County, Port Huron), boat unloading (Bay City), and industrial emissions (Petoskey, Pontiac, Midland, Grand Rapids, Escanaba) may be shown to cause violations of the secondary NAAQS. Measurement is complicated by windblown agricultural soil and other background factors.

Ozone nonattainment is blamed on the automobile. Tailpipe emissions of VOC (volatile organic compounds or hydrocarbons) are the single largest source of precursors to ozone formation. Among the largest stationary VOC sources are surface coating and painting of automobiles, petroleum refining, and gasoline storage and distribution, all connected with automobile use or manufacture. Exact breakdowns of emissions were to be submitted later than the rest of the plan; however, the SIP concludes that automobile-related emissions comprise the vast majority of VOCs.

There are two carbon monoxide (CO) nonattainment areas in Michigan: Detroit and Saginaw. In Detroit, approximately 97% of the CO is produced by mobile sources, motor vehicles. Saginaw is a rare exception to the rule that mobile sources create CO nonattainment. Two iron foundries, located close together, produce 79% of the CO in Saginaw.

There is currently no nonattainment for nitrogen oxides (NO_x) in Michigan.

II. ATTAINMENT STRATEGIES

A. SO_2

1. Continued use of supplementary control systems until compliance with emissions limitation is achieved

2. Midland

   a. Use of lower-sulfur fuel: 0.96% sulfur oil

   b. Planned nuclear cogeneration plant will eliminate old boiler

3. Ingham

   a. Use of 1% sulfur coal

   b. Build taller stack to eliminate downwash

4. State-wide regulation of sulfur in fuel:

   a. Boilers over 500,000 lb of steam per hr: maximum of 1% sulfur in fuel

   b. Boilers under 500,000 lb of steam per hr: 1.5% sulfur in fuel

B. TSP

1. Saginaw

   a. Tighten up cupola controls at Chevrolet Metals Casting

   b. Increased afterburners for briquetting at Grey Iron

   c. Fugitive dust controls at iron yards

2. Flint

   a. Shutdown of Buick Motor Division complex

   b. If no shutdown, prevent malfunctions and institute fugitive dust controls

3. Albion

   a. Hayes: Albion Foundry is the major source

   b. Controls on fugitive industrial emissions to be developed and implemented

   c. Continue current regulations on stack emissions

   d. Require malfunction control

4. Detroit

   a. Modeling inadequacies prevented preparation of full strategy; however, some measures will be taken

   b. RACT already required for Detroit Edison, Wyandette

      - limit malfunction of control equipment

   c. Fugitive emissions

      - enforce current fugitive emissions regulations on coke batteries
      - develop additional regulations for fugitive industrial emissions

   d. Study, evaluate, and implement additional fugitive dust controls

5. Secondary nonattainment areas

   a. Dispersion modeling inadequate

   b. Perform particle microscopy studies

   c. Study, evaluate, and implement controls

   d. Attainment set for 4 years after completion of study (last studies due in mid-1981; last attainment by 1985)

C. O_x

1. FMVECP

2. Inspection and maintenance of motor vehicles (to be passed by legislature)

3. RACT for stationary sources of VOC

   a. 15 categories of sources now covered

   b. 10 additional categories proposed

4. Transportation control measures (Detroit)

a. Mass transit improvements

b. Traffic flow improvements

D. CO

1. Detroit

a. FMVECP

b. Vehicle inspection and maintenance programs

c. Transportation control measures

2. Saginaw

a. FMVECP

b. After-burners on iron foundry cupolas

III. NEW SOURCE REVIEW

Michigan will use an emissions offset policy for all nonattainment areas and all pollutants for the immediate future. A program for banking emission offsets is to be developed, and the question of range of territory from which offsets are to be obtained is to be resolved. The exact ratio of emissions reductions to new emissions is determined on a case-by-case basis, always at least 1:1 but can be higher.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. Existing power plants:

a. $\leq$500 lb steam per hr: maximum sulfur in fuel to be 1.5%

- for solid fuel, SIP estimates this as equivalent to 2.4 lb SO_2 per MM Btu

b. > 500 lb steam per hr: maximum sulfur in fuel to be 1.0%

- for solid fuel, equivalent to 1.6 lb SO_2 per MM Btu

2. Fuel-burning sources other than power plants:

a. Limit effective after 1/1/81

b. 2.4 lb SO_2 per MM Btu for coal combustion

3. New sources: NSPS

B. TSP

1. Existing sources using pulverized coal

   a. Sources producing $\leq$100 lb steam per hr: 0.3 lb PM per lb of stack gas

   b. Sources producing from 100 to 1,000,000 lb steam per hr: 0.28 lb PM per lb of stack gas

   c. Sources producing > 1,000,000 lb steam per hr: limit set case-by-case

2. Existing sources using coal other than pulverized:

   a. with fuel input $\leq$ 20 MM Btu/hr: 0.65 lb PM per MM Btu

   b. with fuel input between 20 MM Btu and 100 MM Btu/hr: 0.45 lb PM per MM Btu

      - to be achieved as expeditiously as possible, but not later than 1/1/81
      - revised from 0.65 lb limit in prerevision SIP

   c. with fuel input > 100 MM Btu/hr: 0.30 lb PM per MM Btu

      - to be achieved by 12/31/82
      - revised from 0.45 lb of PM and the case-by-case setting of requirements in previous SIP

3. New sources: NSPS

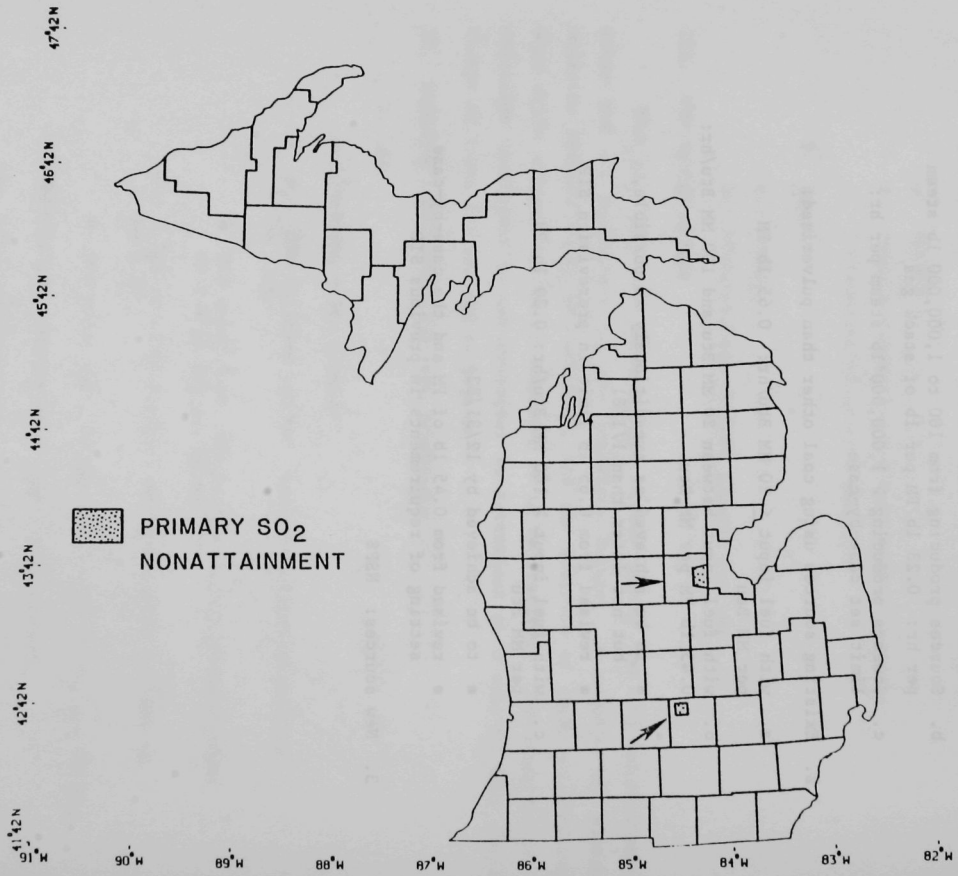


Fig. V.30. Michigan: SO_2 Nonattainment Areas as Designated May 1979

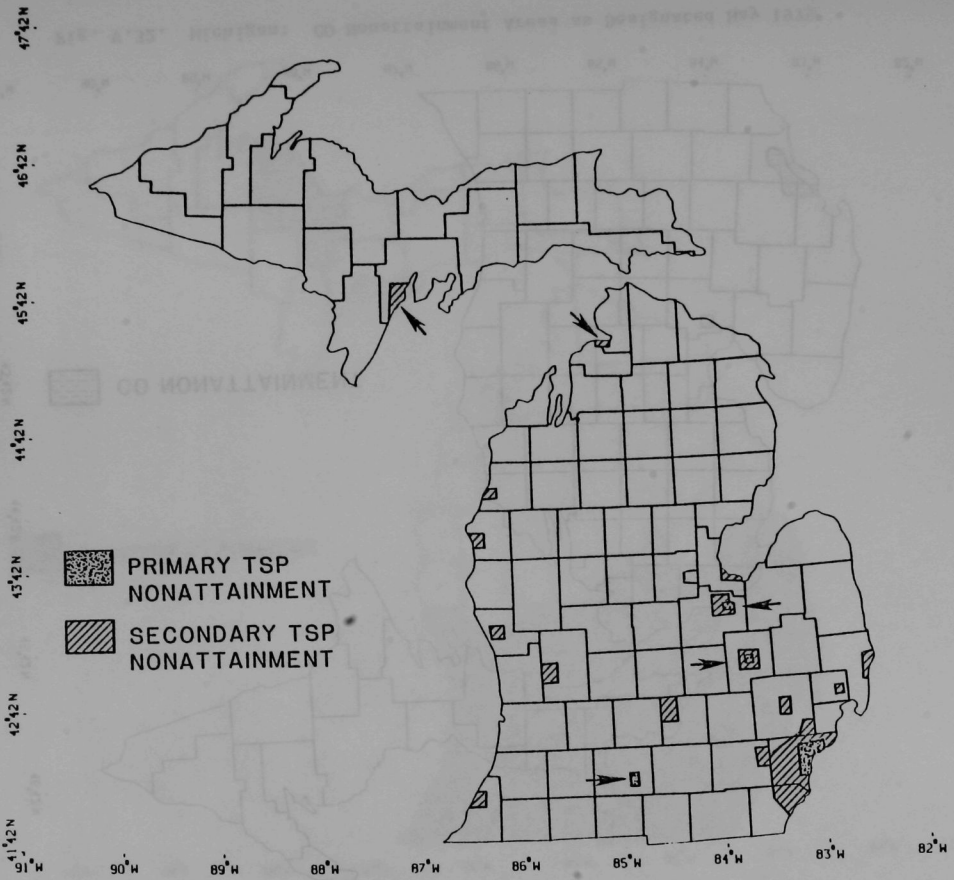


Fig. V.31. Michigan: TSP Nonattainment Areas as Designated May 1979

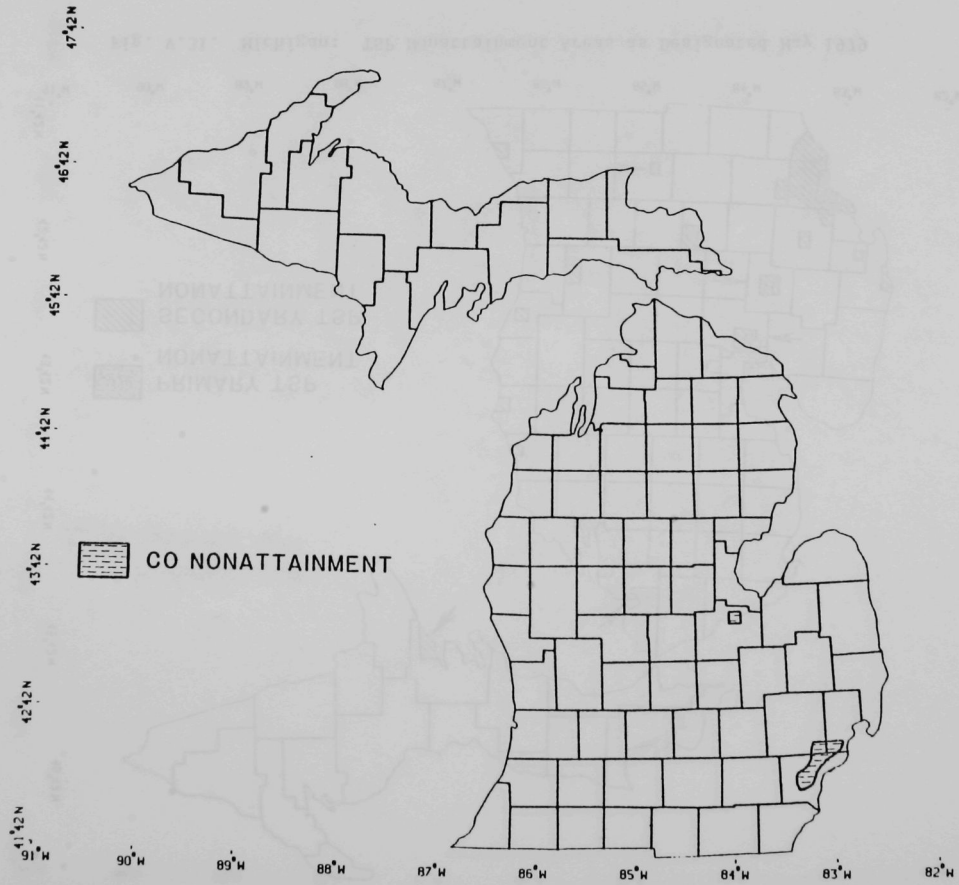


Fig. V.32. Michigan: CO Nonattainment Areas as Designated May 1979

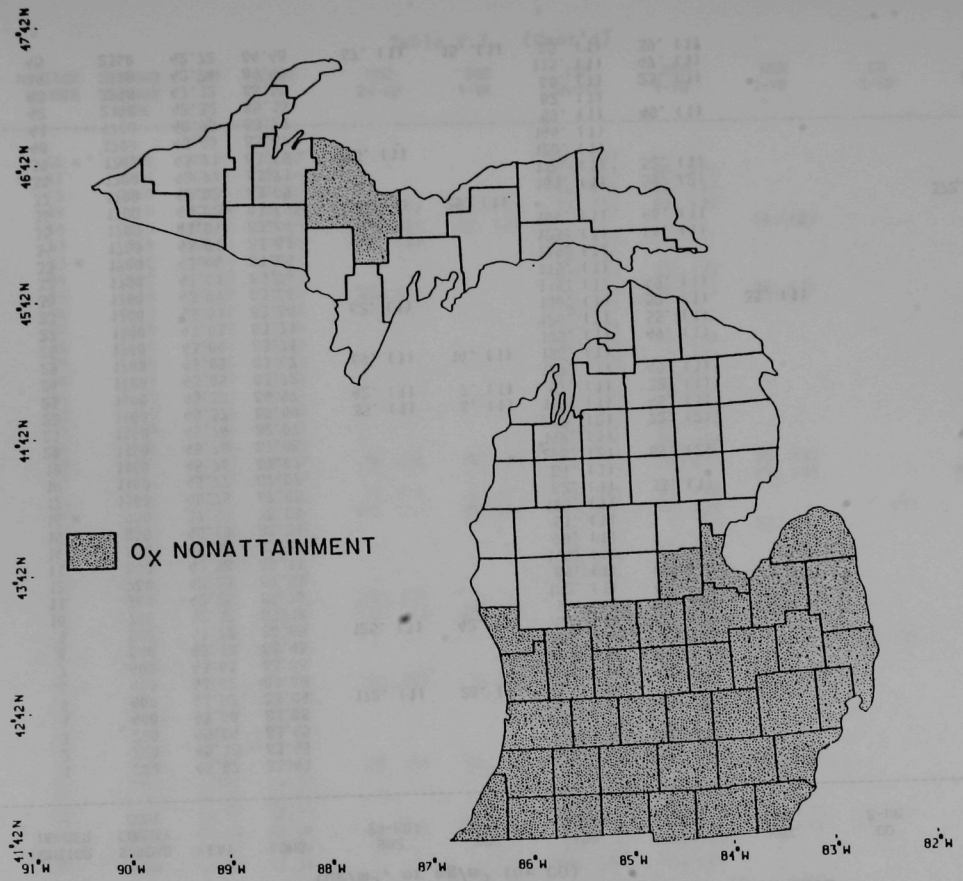


Fig. V.33. Michigan: O_x Nonattainment Areas as Designated May 1979

Table V.7. Michigan: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	220	45.07	83.43			435. (4)	71. (2)			
2	220	45.12	83.45			331. (4)	69. (2)			
3	220	45.04	83.45			134. (1)				
4	400	43.60	83.88			148. (1)	60. (2)			
5	400	43.62	83.84	172. (1)	28. (1)					
6	400	43.62	83.80			117. (1)	46. (1)			
7	400	43.61	83.83			101. (1)	49. (1)			
8	540	42.13	86.43			100. (1)	45. (1)			
9	540	41.77	86.65	125. (1)	42. (1)	89. (1)	43. (1)			
10	760	42.32	85.18			91. (1)	44. (1)			
11	760	42.25	84.76			102. (1)	41. (1)			
12	760	42.25	84.58			89. (1)	42. (1)			
13	800	41.98	86.11			114. (1)				
14	860	45.32	85.26			79. (1)				
15 *	860	45.30	82.23			61. (1)				
16 *	930	37.50	78.68			103. (1)				
17	1160	45.75	87.05			82. (1)	33. (1)			
18	1160	45.77	87.07			84. (1)				
19	1160	45.76	87.07			208. (2)	69. (2)			
20	1160	45.76	87.08			147. (1)				
21	1160	45.76	87.07			252. (2)	72. (2)			
22	1400	45.37	85.00	35. (1)	8. (1)	158. (1)	46. (1)			
23	1400	45.37	84.97	42. (1)	7. (1)	97. (1)	32. (1)			
24	1700	43.05	83.72			129. (1)	49. (1)			
25	1700	43.05	83.67	69. (1)	14. (1)	156. (1)				
26	1700	43.00	83.71			105. (1)	49. (1)			
27	1700	43.03	83.71			126. (1)	55. (1)			
28	1700	43.01	83.68	62. (1)		130. (1)	52. (1)	38. (1)		
30	1700	42.99	83.66			119. (1)	49. (1)			
32	1700	43.01	83.76			115. (1)				
33	1700	43.04	83.64			134. (1)				
34	1700	43.01	83.61			123. (1)	54. (1)			
35	1700	43.04	83.64			104. (1)	46. (1)			
36	1700	43.02	83.69	131. (1)	25. (1)					372. (4)
37	1700	43.02	83.69			161. (1)	59. (2)			
38	1700	42.99	83.71			116. (1)	52. (1)			
39	1700	43.01	83.69	105. (1)		120. (1)				
40	1700	43.05	83.67			144. (1)				
41	1700	42.96	83.71			99. (1)	40. (1)			
42	2140	42.32	85.13			87. (1)				
43	2240	47.12	88.55			60. (1)	23. (1)			
44	2360	42.74	84.47			115. (1)	47. (1)			
45	2360	42.72	84.48	67. (1)	15. (1)	85. (1)	39. (1)			

Table V.7. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
46 *	2360	42.77	78.57			104. (1)				
47	2360	42.75	84.54			221. (2)	64. (2)			
48	2360	42.74	84.52			105. (1)	52. (1)			
49	2360	42.71	84.56	377. (3)	51. (1)	93. (1)	49. (1)			
50	2360	42.74	84.55	380. (3)	59. (1)			80. (2)		
51	2360	42.74	84.55	43. (1)		153. (1)				
53 *	2440	44.41	89.32			80. (1)				
54	2620	42.25	84.41			87. (1)	47. (1)			
55	2660	42.29	85.59	25. (1)		96. (1)	55. (1)	36. (1)		
56	2660	42.32	85.54			90. (1)				
57	2720	42.87	85.64			100. (1)				
58	2720	42.91	85.69			107. (1)	45. (1)			
59	2720	42.95	85.61			97. (1)	42. (1)			
60	2720	42.01	85.70			83. (1)	36. (1)			
61	2720	42.91	85.61			106. (1)	39. (1)			
62	2720	42.95	85.70			123. (1)	51. (1)			
63	2720	42.96	85.66			105. (1)	39. (1)			
64	2720	42.96	85.68			157. (1)	53. (2)			
65	2720	42.97	85.67	38. (1)	10. (1)	124. (1)	52. (1)	58. (1)		
66	2720	42.95	85.67					67. (1)		71. (1)
68	2720	42.96	85.67	21. (1)	8. (1)	118. (1)	61. (2)			
70	2720	42.95	85.67	105. (1)	39. (1)	161. (1)	66. (2)		7. (1)	
71	2720	42.96	85.67					57. (1)		
72	3140	42.53	82.94			123. (1)	57. (2)			
73	3140	42.46	82.96			129. (1)	61. (2)			
74	3140	42.47	83.07			169. (1)	61. (2)			
75	3140	42.51	83.03	178. (1)						
76	3140	42.51	83.03	115. (1)	22. (1)			46. (1)		
77	3140	42.53	83.07			137. (1)	56. (1)			
78	3140	42.51	83.03			153. (1)	67. (2)		7. (1)	
79	3140	42.61	83.01			139. (1)	57. (2)			
80	3140	42.48	82.90	42. (1)	9. (1)	135. (1)	54. (1)	12. (1)		
81	3140	42.70	83.05			118. (1)	44. (1)			
82	3140	42.59	82.80			113. (1)	61. (2)			
83	3140	42.84	82.89			99. (1)	37. (1)			
84	3140	42.70	82.74			113. (1)	41. (1)			
85	3140	42.62	82.89	32. (1)	12. (1)	133. (1)	54. (1)	33. (1)		
86	3200	44.24	86.31			137. (1)				
87	3200	44.22	86.30			91. (1)	39. (1)			
88	3280	46.57	87.39			108. (1)	29. (1)			
89	3280	46.54	87.40	69. (1)	15. (1)	90. (1)	37. (1)	26. (1)		
90	3280	46.44	87.59			78. (1)	33. (1)			
91	3280	46.52	87.50			102. (1)	25. (1)			

Table V.7. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
92	3360	43.94	86.43			100. (1)	37. (1)			
93	3360	43.96	86.45			101. (1)	37. (1)			
94	3360	43.96	86.41			101. (1)				
95	3330	43.69	85.48			46. (1)				
96	3440	45.11	87.62			66. (1)				
97	3500	43.62	84.23			106. (1)	51. (1)			
98	3500	43.60	84.21	207. (1)						
99	3500	43.62	84.23	61. (1)	11. (1)			25. (1)		
101 *	3600	41.93	89.38			103. (1)	50. (1)			
102 *	3600	41.92	89.40	212. (1)	44. (1)	133. (1)	71. (2)			
103 *	3600	41.91	90.53			171. (1)				
104	3600	41.96	83.66	55. (1)		140. (1)	71. (2)	33. (1)		
105 *	3600	41.91	89.38	203. (1)						
106 *	3600	41.92	89.40	73. (1)	23. (1)			39. (1)		
107	3620	41.91	83.38	129. (1)						
108	3760	43.24	86.25			124. (1)	50. (1)			
109	3760	43.23	86.25			117. (1)	47. (1)			
110	3760	43.24	86.25			126. (1)	42. (1)			
111	3760	43.23	86.20	75. (1)	21. (1)	101. (1)	38. (1)	32. (1)		
112	3760	43.26	86.24	1129. (4)	64. (2)					
113	3760	43.23	86.25	191. (1)	28. (1)			37. (1)		
114 *	3760	0.0	0.0	121. (1)	24. (1)					
115	3980	42.64	83.29			82. (1)				
117	3980	42.65	83.26	18. (1)		161. (1)				
118 *	3930	42.49	90.86			111. (1)				
119	3980	42.45	83.22	152. (1)	40. (1)					
120	3980	42.45	83.22			104. (1)				
121	3980	42.45	83.22						9. (2)	
122	3980	42.45	83.22	44. (1)	11. (1)			43. (1)		
123	4060	46.76	89.58	22. (1)	7. (1)	43. (1)	19. (1)	7. (1)		
124	4160	43.08	86.21			85. (1)	36. (1)			
125	4620	42.79	82.49			137. (1)	48. (1)			
126	4620	42.86	82.63			124. (1)	42. (1)			
127	4620	42.97	82.44	238. (1)	44. (1)	172. (1)	75. (2)	73. (1)	7. (1)	
128	4620	42.97	82.40			134. (1)				
129	4620	42.99	82.42			164. (1)	77. (3)			
130 *	4620	42.72	88.49			111. (1)	56. (1)			
132 *	4780	42.59	81.45			155. (1)	64. (2)			
133	4780	43.41	83.95			119. (1)	47. (1)			
134	4780	43.41	83.93			107. (1)				
135 *	4780	43.45	89.91	247. (1)	30. (1)	176. (1)	69. (2)	76. (2)	16. (4)	
136	4780	43.42	83.96	41. (1)		120. (1)	55. (1)			
133	4780	43.45	83.91			128. (1)	54. (1)			

Table V.7. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
139	4780	43.41	83.90			110. (1)	50. (1)			
140	5180	42.25	85.89			74. (1)				
141	5280	42.24	83.60			123. (1)				
142 *	5280	2.57	81.29			68. (1)				
143	5280	42.28	83.74			120. (1)				
144	5320	42.36	83.07			140. (1)	76. (3)			
146	5320	42.31	83.23	208. (1)	32. (1)	179. (1)	69. (2)			
147	5320	42.31	83.15			260. (2)	126. (4)			
148	5320	42.32	83.17	62. (1)	25. (1)	180. (1)				
150	5320	42.23	83.21	160. (1)	31. (1)	192. (1)	88. (3)		8. (2)	
151	5320	42.33	83.03	181. (1)	50. (1)	283. (3)	109. (4)			514. (4)
153	5320	42.34	83.03					58. (1)		
154	5320	42.43	83.00	101. (1)	25. (1)	193. (1)	69. (2)			
155	5320	42.41	83.08	152. (1)	31. (1)	199. (2)	86. (3)			455. (4)
156	5320	42.41	83.08	87. (1)				73. (1)		
157	5320	42.37	82.98	99. (1)	28. (1)	178. (1)	88. (3)			
158	5320	42.36	83.10	168. (1)	33. (1)	223. (2)	92. (3)		10. (2)	
159	5320	42.36	83.10	116. (1)				61. (1)		
160	5320	42.30	83.11	306. (2)	68. (2)	304. (3)				
161	5320	42.39	83.23	130. (1)	24. (1)	130. (1)	61. (2)		14. (4)	
162	5320	42.36	83.07	70. (1)	27. (1)			71. (1)		
163	5320	42.16	83.16			156. (1)	71. (2)			
164	5320	42.20	83.16			174. (1)	82. (3)			
165	5320	42.31	83.42	125. (1)	21. (1)	117. (1)				
166	5320	42.17	83.39	114. (1)	17. (1)	119. (1)	67. (2)			
167	5320	42.14	83.18			69. (1)				
168	5320	42.14	83.19			148. (1)				
170	5320	42.14	83.19	109. (1)	28. (1)					
171 *	5320	0.0	0.0			127. (1)				
173	5320	42.27	83.13	192. (1)	48. (1)	214. (2)	102. (4)			
174	5320	43.21	86.24			145. (1)				
175	5320	42.38	83.40	146. (1)	21. (1)	120. (1)	55. (1)		5. (1)	
176	5340	44.25	85.40			53. (1)				

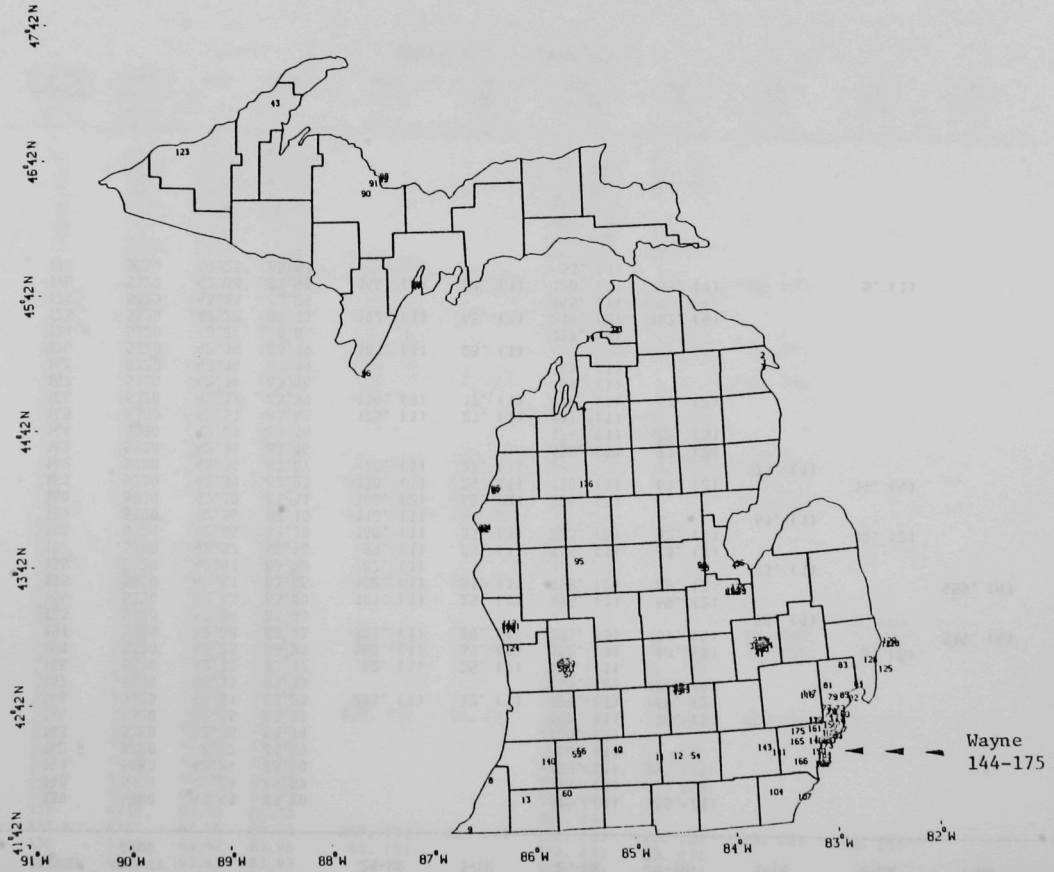


Fig. V.34. Michigan: Locations of SAROAD Monitors (See Table V.7 for Monitor Numbers)

Fig. V.35. Michigan: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

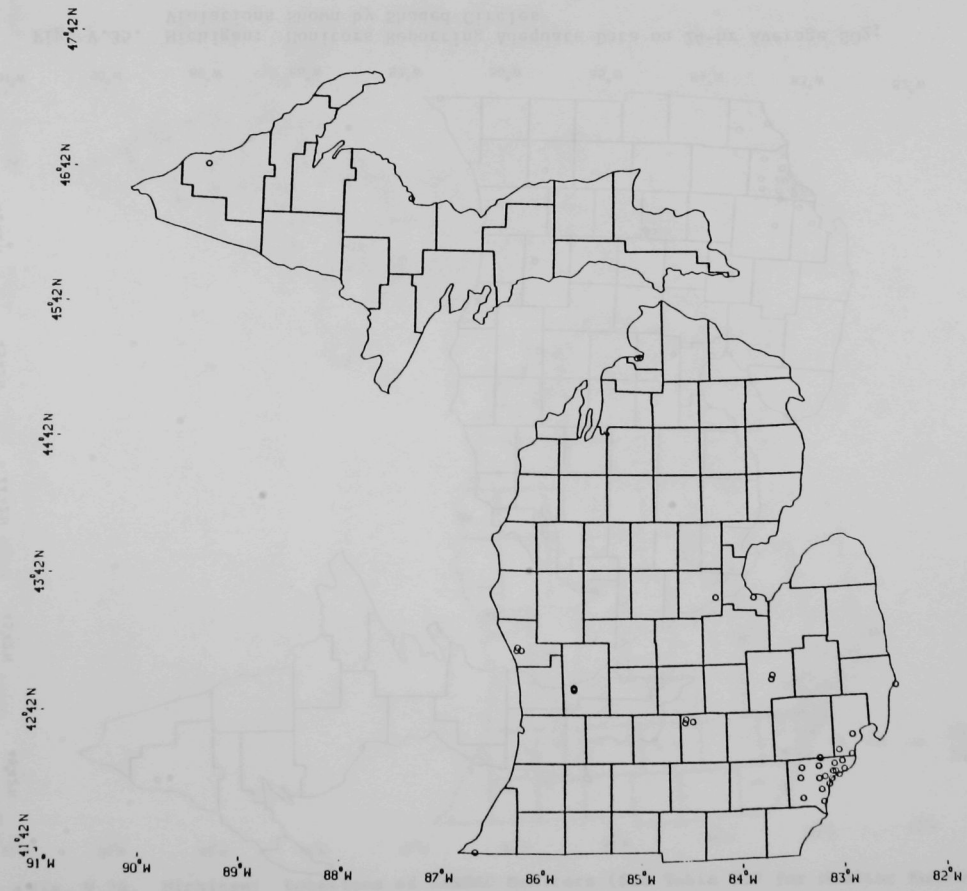


Fig. V.36. Michigan: Monitors Reporting Adequate Data on Annual Average SO2; No Violations

Fig. V.37. Michigan: Monitors Reporting Adequate Data on 24-hr Average TSP; No Violations

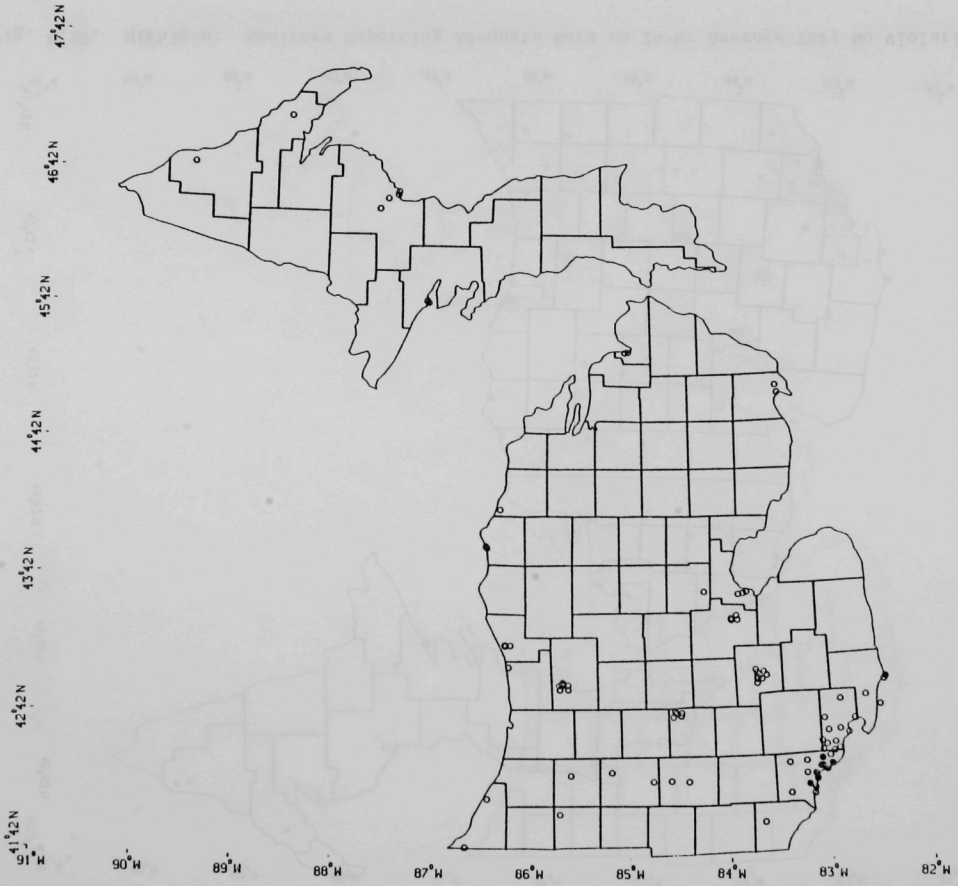


Fig. V.38. Michigan: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

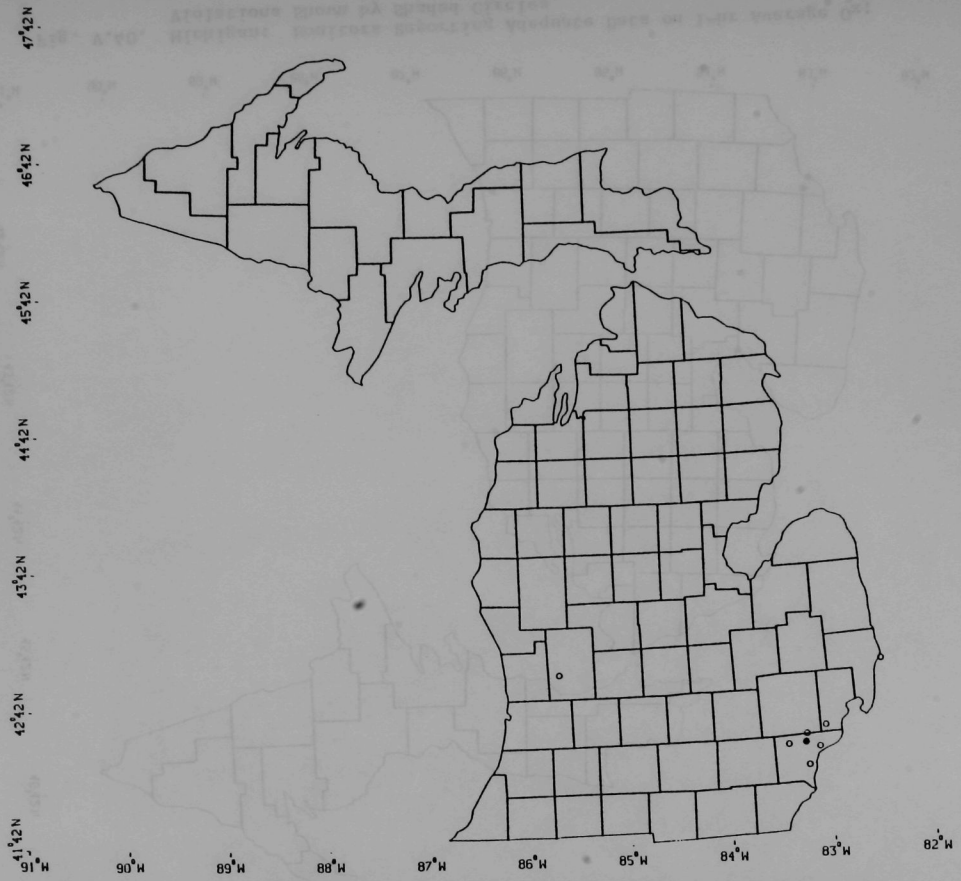


Fig. V.39. Michigan: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

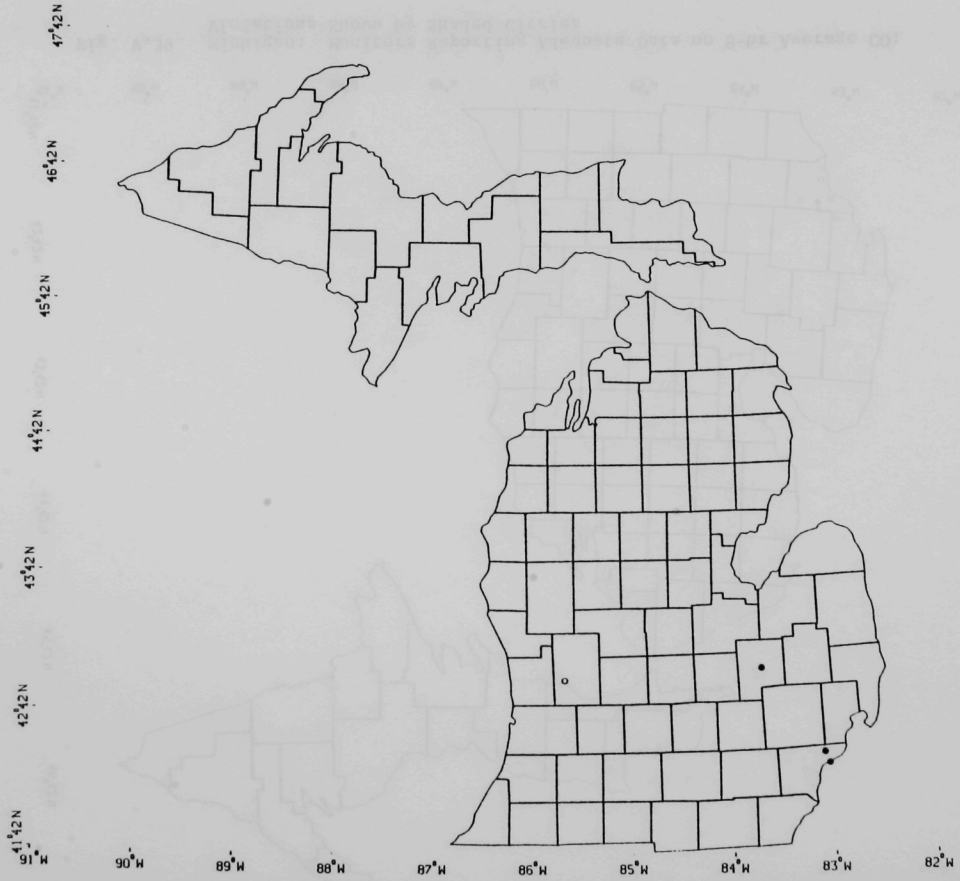


Fig. V.40. Michigan: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

Fig. V.41. Michigan: Monitors Reporting Adequate Data on Annual Average NO_2; No Violations

Table V.8. Michigan: Power Plant Data

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		ADVANCE	45.23	85.03	37.00	0.0
2	*	BAYSIDE	0.0	0.0	35.00	0.0
3	N*	BIG ROCK POINT	0.0	0.0	20.63	0.0
4		CAMPBELL	42.91	86.20	650.00	0.0
5		COBB	43.25	86.24	510.50	0.0
6		CONNORS CREEK	42.36	82.96	510.00	0.0
7		DELRAY	42.29	83.10	375.00	0.0
8	N	D.C. COOK	41.96	86.42	1089.00	0.0
9		ECKERT	42.72	84.56	336.00	0.0
10		ERICKSON 1	42.69	84.61	160.00	0.0
11		FERMI 1	41.94	83.54	153.00	0.0
12		GREENWOOD 1	41.93	85.53	53.50	0.0
13		HARBOR BEACH	43.84	82.66	121.00	0.0
14		J DE YOUNG	42.96	85.99	77.25	0.0
15		KARN	43.65	83.84	1155.00	0.0
16		MARYSVILLE	42.92	82.46	200.00	0.0
17	N	MIDLAND(NUCL)	43.65	84.39	59.95	0.0
18		MISTERSKY	42.30	83.09	201.05	0.0
19		MONROE	41.89	83.34	3280.00	0.0
20		MORROW	42.28	85.49	183.00	0.0
21		OTTAWA	42.75	84.56	81.50	0.0
22	N*	PALISADES	0.0	0.0	811.00	0.0
23		PENNSALT	42.19	83.16	37.00	0.0
24		PLANT #65	42.60	84.37	40.00	0.0
25		PRESQUE ISLE	46.58	87.39	338.80	0.0
26		RIVER ROUGE	42.27	83.11	933.00	0.0
27		SHIRAS	46.55	87.38	37.00	0.0
28		ST CLAIR	42.76	82.47	1905.00	0.0
29		TRENTON CHANNEL	42.13	83.18	776.00	0.0
30		WEADOCK	43.64	83.85	614.50	0.0
31		WHITING	41.79	83.45	325.00	0.0
32	*	WYANDOTTE	42.21	83.14	47.00	0.0
33	*	WYANDOTTE	42.21	83.15	68.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.9. Michigan: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	ADVANCE	2.15	136.10	0.30	2.90	0.0
2	* BAYSIDE	0.92	53.50	0.0	0.0	505.20
3	N * BIG ROCK POINT	0.0	0.0	0.0	0.0	0.0
4	CAMPBELL	3.35	1487.00	0.40	45.50	0.0
5	COBB	3.39	1517.00	0.40	44.30	0.0
6	CONNORS CREEK	1.33	675.00	0.30	199.39	5147.00
7	DELRAY	0.0	0.0	1.01	317.71	22345.00
8	N D.C. COOK	0.0	0.0	0.0	0.0	0.0
9	ECKERT	2.97	386.90	0.0	0.0	0.0
10	ERICKSON 1	3.59	402.41	0.0	0.0	0.0
11	FERM 1	0.0	0.0	0.30	159.50	0.0
12	GREENWOOD 1	0.0	0.0	0.0	0.0	0.0
13	HARBOR BEACH	2.73	270.00	0.32	23.90	0.0
14	J DE YOUNG	3.22	112.80	0.0	0.0	3.10
15	KARN	3.07	1272.00	0.45	2924.30	0.0
16	MARYSVILLE	2.13	472.00	0.0	0.0	90.00
17	N MIDLAND(NUCL)	0.0	0.0	0.0	0.0	0.0
18	MISTERSKY	1.80	271.47	0.30	101.79	0.0
19	MONROE	2.72	6199.00	0.30	237.38	0.0
20	MORROW	0.0	0.0	1.10	1103.80	0.70
21	OTTAWA	2.81	35.85	0.0	0.0	0.0
22	N * PALISADES	0.0	0.0	0.0	0.0	0.0
23	PENNSALT	1.61	137.00	0.30	88.53	0.0
24	PLANT #65	0.73	101.70	0.0	0.0	1320.70
25	PRESQUE ISLE	1.30	910.30	0.0	0.0	0.0
26	RIVER ROUGE	2.63	135.00	1.00	3761.31	8543.00
27	SHIRAS	3.60	81.70	0.0	0.0	295.10
28	ST CLAIR	2.01	2939.00	1.01	2671.86	413.00
29	TRENTON CHANNEL	1.61	1673.00	0.30	273.77	0.0
30	WEADOCK	3.07	771.00	0.45	2764.60	0.0
31	WHITING	0.79	835.00	0.45	1.80	0.0
32	* WYANDOTTE	0.83	221.00	0.29	312.71	1718.00
33	* WYANDOTTE	1.34	7.06	0.0	0.0	21.43

N NUCLEAR * NOT PLOTTED

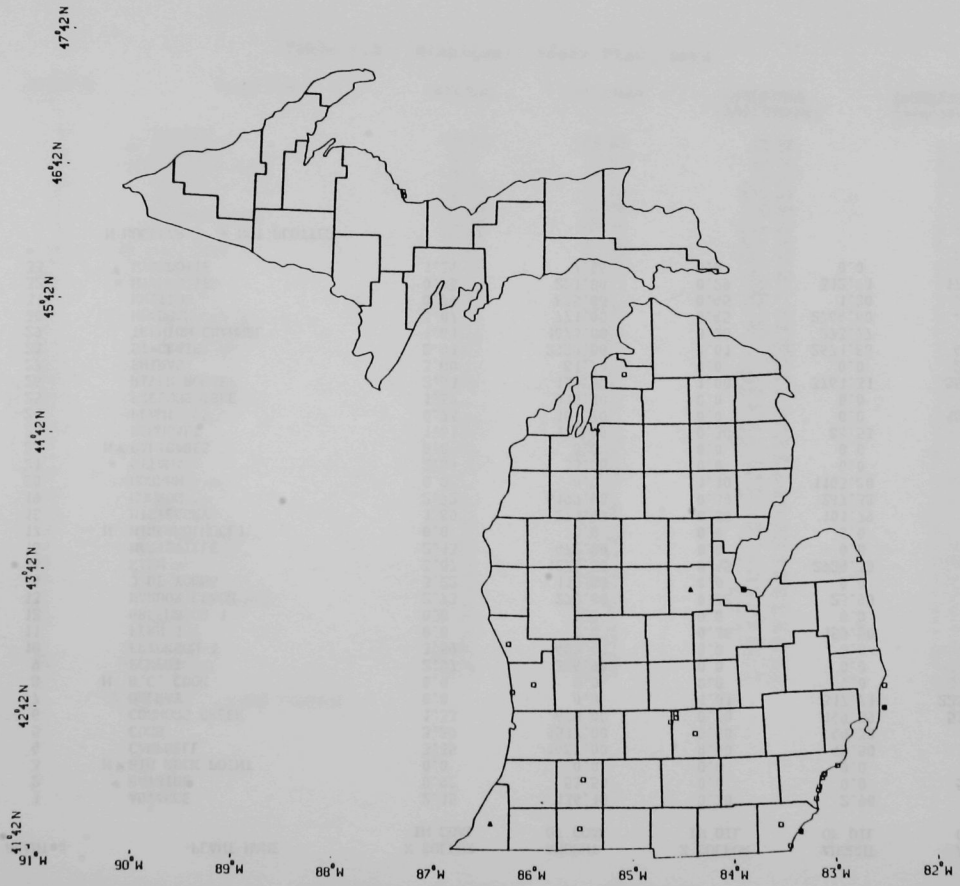


Fig. V.42. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

Fig. V.43. Power Plant Key (See Tables V.8 and V.9 for Identification and Fuel Use Data)

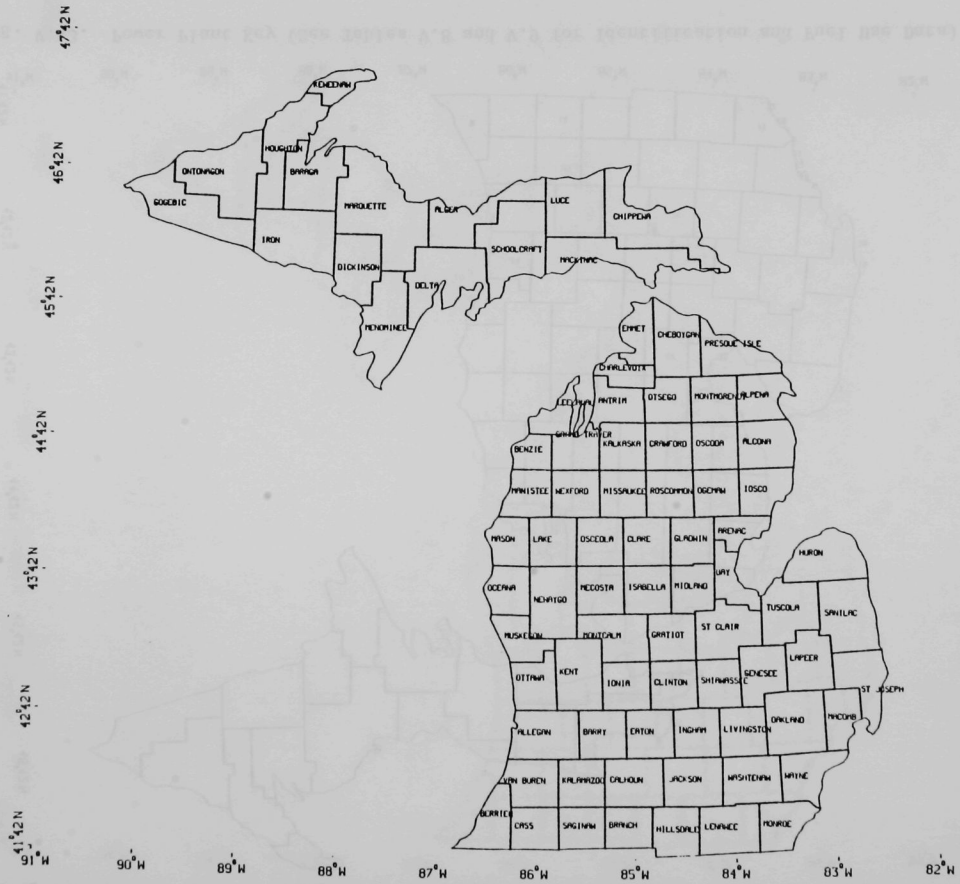


Fig. V.44. Michigan: Key to Counties

REGION V: MINNESOTA

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a]		No. of Monitors	No. of Monitors Recording Primary Violations
		Primary	Secondary		
SO_2	24 hr	2	0	40	2
	1 yr			31	1
TSP	24 hr	3	6	78	6
	1 yr			64	6
NO_x	1 yr	0[b]	-	17	0
CO	8 hr	4	-	7	4
O_x	1 hr	3	-	9	6

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	21
Nuclear	2
Total	23

MINNESOTA (Draft SIP, to be reviewed)

I. SOURCE OF THE PROBLEM

Minnesota has designated the entire AQCR 131, covering 7 counties (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington) in the region of the Twin Cities of Minneapolis and St. Paul as in nonattainment for primary TSP, SO_2, CO, and O_x. In addition, an SO_2 nonattainment area was designated in the city of Rochester (Olmsted County). The cities of International Falls (Koochiching Co.) and Duluth (St. Louis Co.) were also designated as primary TSP nonattainment areas. Secondary TSP areas occur in Red Wing (Goodhue Co.), East Grand Forks (Polk Co.), Cloquet (Carlton Co.), Silver Bay (Lake Co.) and several areas in the Mesabi Iron Range in northern St. Louis County. In Red Wing, sources of particulate emissions include a wood processing plant, a linseed oil manufacturing plant, and several grain handling facilities, with violations attributed to fugitive process emissions from the point sources. In East Grand Forks, major soil erosion by wind and road dust (especially resuspended dust from motor vehicles in the neighboring town of Grand Forks, N. Dakota) are considered to be major contributors to the particulate load. In Cloquet, Potlach Kraft paper mill, Diamond Match Co., American Cyanamid's aluminum production plant, and Conwed's fiber products plant all contribute fugitive process emissions of particulates. Silver Bay's nonattainment is the result of fugitive dust from unpaved roads, storage areas, and materials handling at Reserve Mining's taconite plant. In the Mesabi Iron Range, a U.S. Steel Plant (in Mountain Iron), and the Virginia Public Utility power plant (in Virginia) contributed particulate matter, limited mostly to the plant property, however. Areas sources and fugitive dust were responsible for the majority of the particulate load. In the town of Hibbing in the Mesabi Range, traffic particulates and soil were responsible for more than half of the material collected on filters.

In addition to AQCR 131, Duluth (St. Louis Co.), Rochester (Olmsted) and St. Cloud (Stearas) have been designated as in nonattainment for CO, as a result of motor vehicle emissions. O_x nonattainment counties are those in AQCR 131, with the addition of the neighboring Sherburne, Lake, St. Louis and Carlton Counties around Duluth and Olmsted County containing Rochester, with violations attributed to motor vehicles.

Minnesota's SIP submittals were delayed. In May 1979, the EPA approved an 18-month extension for submittal of an attainment plan for secondary TSP.

II. ATTAINMENT STRATEGIES

A. TSP

1. Secondary areas

a. RACT already required on point sources

b. Extension for plan submittal approved

c. Need to develop controls for fugitive process and fugitive dust emissions

B. CO

1. St. Cloud, Rochester, & Duluth

a. Improved public transportation

b. Parking controls

c. Fringe parking

d. Pedestrian malls

e. Bicycle paths

f. Employer programs for car/van pools

2. Minneapolis/St. Paul

a. Metered freeway

b. Computerized signals

c. One-way streets in central business district

d. Pedestrian malls

e. Bicycle paths

f. Fringe parking

g. Variable working hours (flextime has been used by numerous employers since 1977)

h. Van/car pool

3. Inspection and maintenance program

a. Need for mandatory program not yet demonstrated

C. O_x

1. All areas

2. Reductions accompanying CO plan may result in adequate reductions to achieve new standard (0.12 ppm) by December 1982
3. Expand ozone monitoring network
4. RACT on major stationary sources according to EPA control technique guidances
5. Consider need for inspection and maintenance of motor vehicles

III. NEW SOURCE REVIEW

Minnesota will use an emissions offset approach to new sources in nonattainment areas.

IV. EMISSION LIMITATION FOR FUEL COMBUSTION

A. SO_2

1. Existing fossil-fuel burning

a. Minneapolis-St. Paul AQCR

- with heat input > 250 MM Btu/hr: 3.0 lb SO_2/MM Btu
- individual sources with heat input < 250 MM Btu/hr, and total rated heat input of plants > 250 MM Btu/hr: 3.0 lb SO_2/MM Btu
- with total heat input $\leq$ 250 MM Btu/hr: 4.0 lb SO_2/MM Btu

b. Elsewhere in state

- with total heat input $\geq$ 250 MM Btu/hr: 4.0 lb SO_2/MM Btu
- no emission limits on sources with total heat input < 250 MM Btu/hr

2. New coal-burning sources

a. Statewide, with heat input > 250 MM Btu: 1.2 lb SO_2/MM Btu (NSPS)

b. Minneapolis-St. Paul AQCR

- individual sources with heat input < 250, but total heat input > 250 MM Btu/hr: 3.0 lb SO_2/MM Btu
- total heat input < 250 MM Btu/hr: 4.0 lb SO_2/MM Btu

c. Rest of state

- individual sources with heat input < 250 MM Btu, but total heat input > 250 MM Btu: 4.0 lb SO_2/MM Btu
- with heat input < 250 MM Btu/hr: no emission limit

3. The revised SIP for SO_2 has not been reviewed. These emission limitations were from the previous SIP (4/78).

B. TSP

1. Existing sources

a. Minneapolis-St. Paul AQCR and city of Duluth

- all sizes: 0.4 lb PM/MM Btu

b. Elsewhere in state

- all sizes: 0.6 lb PM/MM Btu

2. New sources

a. Minneapolis-St. Paul AQCR and city of Duluth

- with heat input > 250 MM Btu/hr: 0.1 lb PM/MM Btu
- sources with individual equipment with heat input ≤ 100 MM Btu/hr, and all of equipment at plant with total heat input > 250 MM Btu/hr: 0.4 lb PM/MM Btu
- with total heat input ≤ 250 MM Btu: 0.4 lb PM/MM Btu

b. Elsewhere in state

- with heat input > 250 MM Btu/hr: 0.1 lb PM/MM Btu
- individual sources with heat input ≤ 250 MM Btu/hr and total heat input > 250 MM Btu/hr: 0.4 lb PM/MM Btu
- with total heat input ≤ 250 MM Btu/hr: 0.4 lb PM/MM Btu

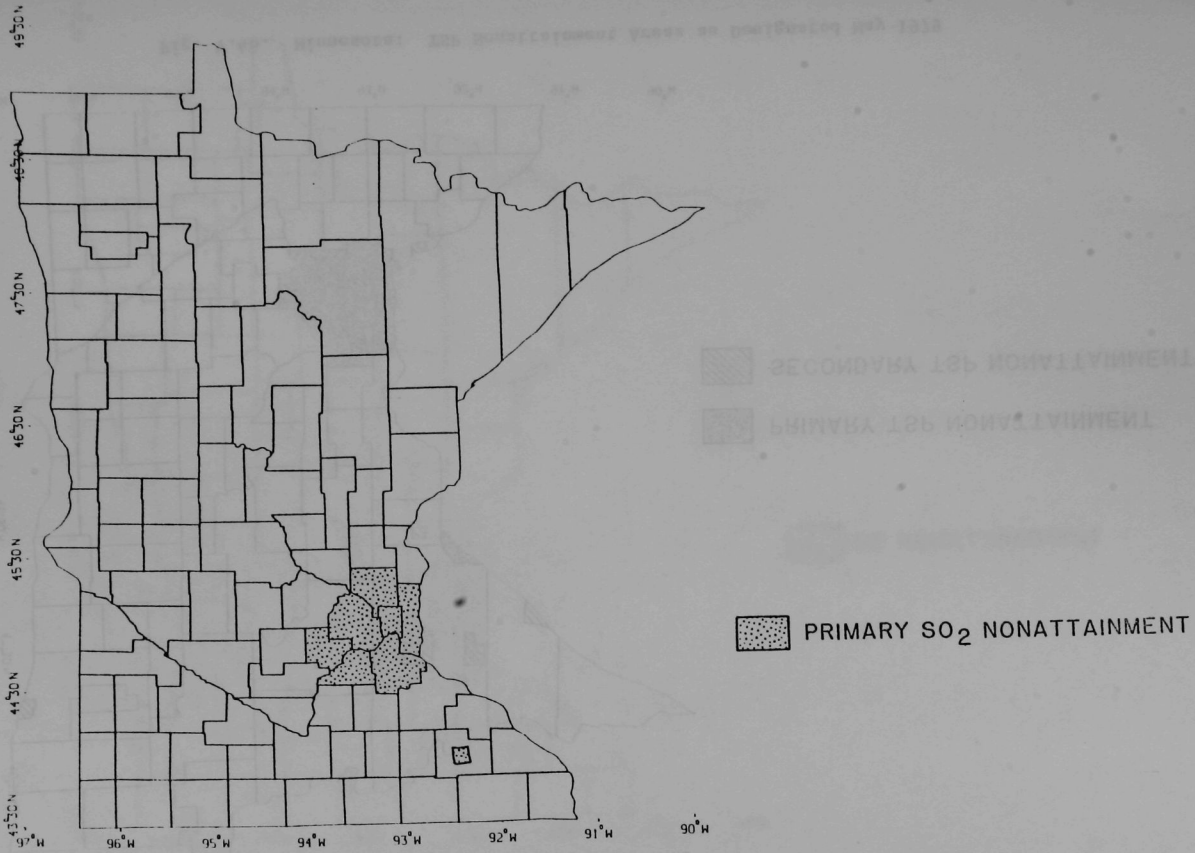


Fig. V.45. Minnesota: SO_2 Nonattainment Areas as Designated May 1979

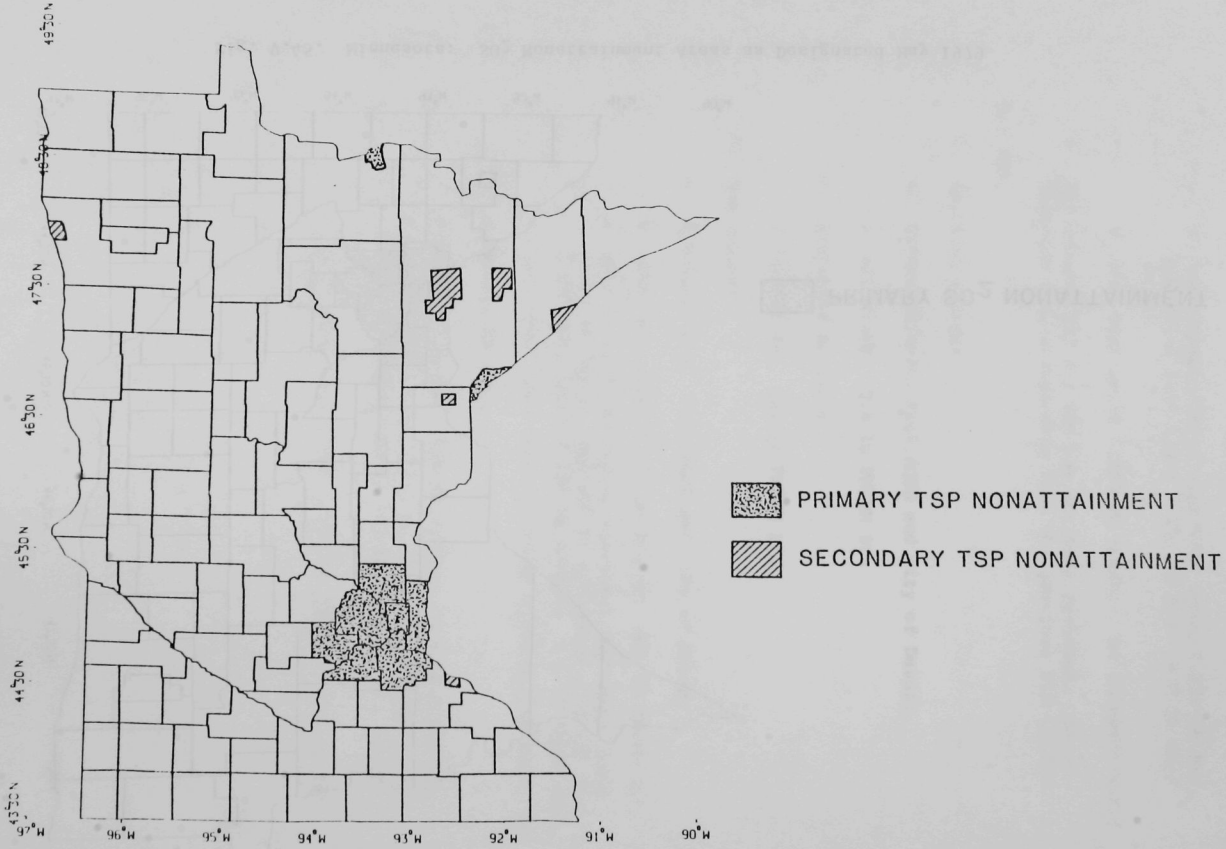


Fig. V.46. Minnesota: TSP Nonattainment Areas as Designated May 1979

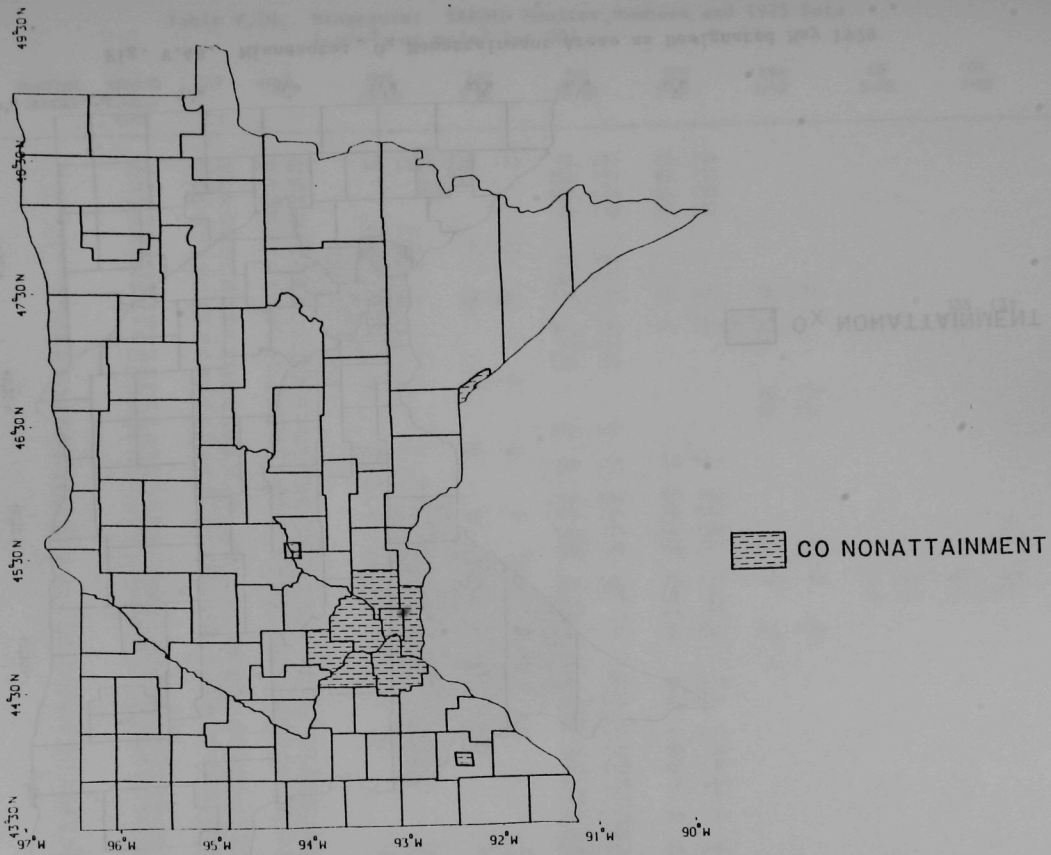


Fig. V.47. Minnesota: CO Nonattainment Areas as Designated May 1979

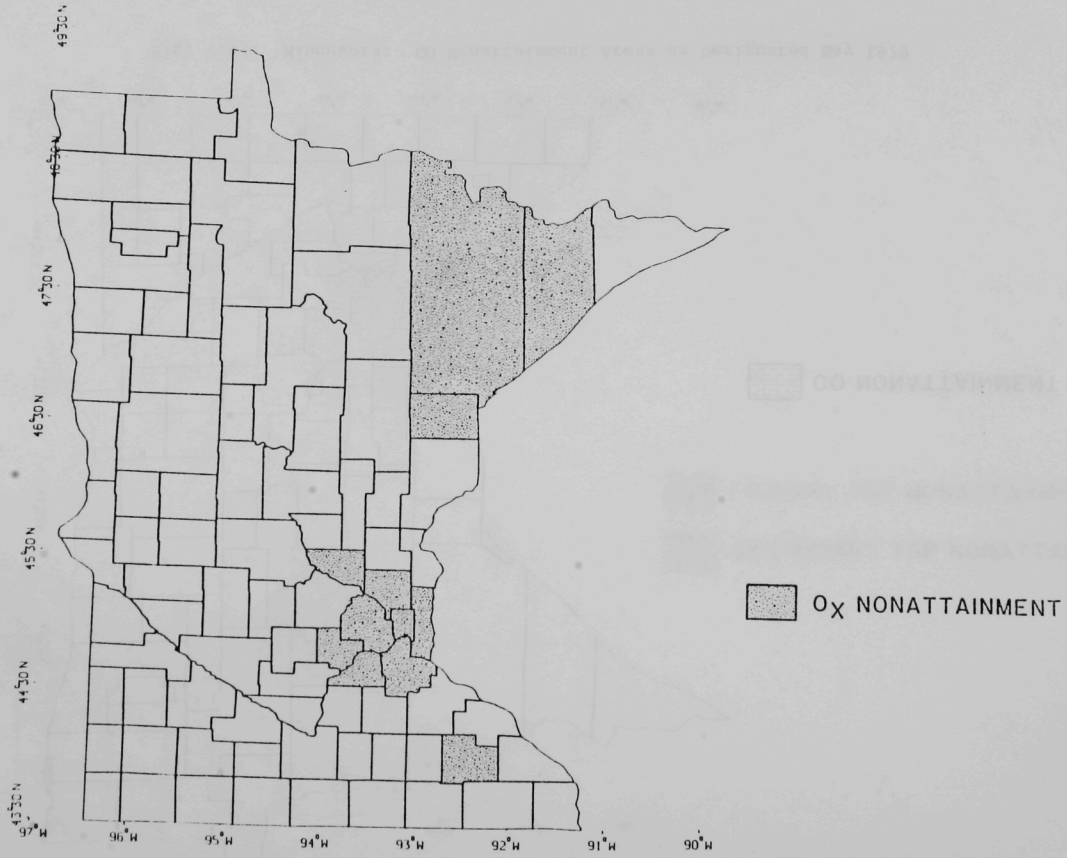


Fig. V.48. Minnesota: O_X Nonattainment Areas as Designated May 1979

Table V.10. Minnesota: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	240	47.48	94.87	10. (1)	4. (1)	92. (1)	25. (1)			
2	320	45.31	96.44			154. (1)	40. (1)			
3	400	44.17	93.99			150. (1)	66. (2)			
4	560	46.72	92.43			91. (1)	23. (1)			
5	560	46.72	92.43	3. (1)						
6	560	46.72	92.43	60. (1)	7. (1)					
7	720	46.87	96.76	5. (1)		70. (1)				
8	900	45.36	94.20			87. (1)				
9	940	44.76	93.03	516. (4)	69. (2)	154. (1)	55. (1)	30. (1)		
10	940	44.74	92.86							188. (3)
11	940	44.74	92.85			195. (1)	61. (2)			
12	1380	44.57	92.53			53. (1)				
13	1380	44.57	92.54			231. (2)				
16	1480	44.88	93.30	29. (1)	6. (1)					
17	1480	44.88	93.30					22. (1)		
18	1480	44.88	93.30					59. (1)		
19	1480	44.98	93.26			473. (4)				
20	1480	44.97	93.27	266. (1)	40. (1)					
21	1480	44.95	93.34			109. (1)	49. (1)			
22	1480	44.97	93.23	27. (1)						
23	1480	45.04	93.30			114. (1)	52. (1)			
24	1480	45.02	93.24	130. (1)	40. (1)	141. (1)	54. (1)			
26	1480	44.97	93.27			134. (1)	68. (2)			
27	1480	44.97	93.21	47. (1)		125. (1)	63. (2)	52. (1)		
28	1480	44.97	93.21	86. (1)	16. (1)					
29	1480	44.97	93.21	147. (1)	45. (1)	209. (2)	77. (3)	47. (1)	9. (2)	127. (2)
31	1480	44.98	93.26	228. (1)	48. (1)	140. (1)	64. (2)		10. (3)	141. (2)
32	1480	44.93	93.33			86. (1)	37. (1)			
33	1480	44.96	93.24	89. (1)	15. (1)	191. (1)	77. (3)	84. (2)		
35	1480	45.04	93.30	18. (1)						
36	1480	44.87	93.19	138. (1)	25. (1)					
37	1480	44.83	93.35			93. (1)	39. (1)			
38	1480	44.85	93.25			125. (1)	47. (1)			
40	1480	44.84	93.31			111. (1)				
41	1480	44.83	93.29	159. (1)	31. (1)	134. (1)	54. (1)			
43	1480	44.97	93.51			123. (1)	53. (1)			
44	1660	47.24	93.50			68. (1)	21. (1)			
45	1740	45.12	95.05			136. (1)	52. (1)			
46	1780	48.60	93.41			148. (1)				
47	1780	48.60	93.41			212. (2)	33. (1)			
48	1780	48.60	93.40			572. (4)				
49	1780	48.61	93.40	16. (1)	4. (1)	594. (4)	94. (4)			
50	2040	44.46	95.79			197. (2)	71. (2)			
51	2060	44.89	94.37			196. (2)				

Table V.10. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
52	2240	46.74	92.17	39. (1)	9. (1)	183. (1)	72. (2)	49. (1)		
53	2420	43.67	92.99			211. (2)	62. (2)			
54	2560	43.62	95.61	8. (1)	3. (1)	189. (1)	55. (1)			
55	2660	44.08	92.53							333. (4)
56	2660	44.03	92.46						16. (4)	
57	2660	44.04	92.47	50. (1)	6. (1)	116. (1)	53. (1)			
58	2660	44.03	92.46			136. (1)	70. (2)			
59	2660	44.02	92.44	76. (1)	11. (1)	114. (1)	49. (1)	28. (1)		
60	2660	44.04	92.49			139. (1)	55. (1)			
61	2660	44.02	92.46	273. (1)	26. (1)	202. (2)	61. (2)			
62	2720	46.23	96.07			333. (4)	63. (2)			
63	2880	47.92	97.01	3. (1)		245. (2)	74. (2)			
64	2940	44.90	93.01			35. (1)				
65	2940	44.95	93.10	120. (1)	24. (1)	125. (1)	66. (2)	58. (1)		
66	2940	44.95	93.10	148. (1)	47. (1)	180. (1)	72. (2)	65. (1)	9. (2)	206. (4)
69	2940	44.95	93.09	115. (1)	17. (1)	243. (2)	92. (3)	63. (1)	10. (3)	231. (4)
70	2940	44.93	93.13			194. (1)	52. (1)			
71	2940	44.98	93.13			150. (1)				
72	2940	44.97	93.06	131. (1)	17. (1)	233. (2)	58. (2)	51. (1)		
73	2940	44.90	93.02	58. (1)	10. (1)	287. (3)	68. (2)	38. (1)		
74	2940	44.91	93.17			196. (2)	42. (1)			
75	2940	44.93	93.08			218. (2)	65. (2)			
78	2940	44.95	93.09						4. (1)	
79	2940	44.96	93.19			164. (1)	78. (3)			
80	2940	44.95	93.09	67. (1)						
81	2940	44.96	93.19	97. (1)	15. (1)			56. (1)		
82	3260	48.43	92.85							137. (2)
83	3260	46.84	92.22			48. (1)	19. (1)			
84	3260	47.53	92.62			136. (1)	47. (1)			
85	3260	47.52	92.15			111. (1)	37. (1)			
87	3260	47.52	92.54			149. (1)	45. (1)			
88	3260	47.90	91.86			138. (1)	40. (1)			
89	3260	46.78	92.10			174. (1)				
90	3260	46.79	92.10							274. (4)
91	3260	46.78	92.10	68. (1)	25. (1)				12. (3)	
92	3260	46.78	92.11			130. (1)				
95	3260	47.43	92.93			75. (1)	34. (1)			
96	3260	46.70	92.21			123. (1)	39. (1)			
97	3260	46.67	92.24	37. (1)	6. (1)					
98	3260	46.77	92.12	89. (1)	19. (1)	160. (1)	62. (2)			
99	3260	46.78	92.11			137. (1)	41. (1)			
100	3260	46.83	92.03			106. (1)	47. (1)			
101	3260	46.77	92.12					59. (1)		
103	3260	46.67	92.24			170. (1)	47. (1)			
104	3260	46.78	92.10	42. (1)		115. (1)		29. (1)		
106	3400	44.80	93.52			134. (1)	48. (1)			

Table V.10. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
107	3440	45.42	93.75							343. (4)
110	3660	45.63	94.21			87. (1)	29. (1)			
111	3660	45.33	94.73			82. (1)	36. (1)			
112	3660	45.67	94.32			81. (1)	32. (1)			
114	3660	44.85	92.93	207. (1)	25. (1)	146. (1)	51. (1)	36. (1)		
115	3660	45.31	94.30			80. (1)	34. (1)			
117	3660	45.56	94.16	59. (1)	5. (1)	140. (1)	56. (1)			
118	3660	45.55	94.15			115. (1)	44. (1)			
119	4000	45.05	92.80			182. (1)	43. (1)			
120	4000	44.85	93.00		100. (3)					
121	4000	44.85	93.00	205. (1)						
122	4000	44.85	93.00	604. (4)						
123	4200	44.06	91.64	29. (1)	5. (1)	353. (4)	85. (3)			

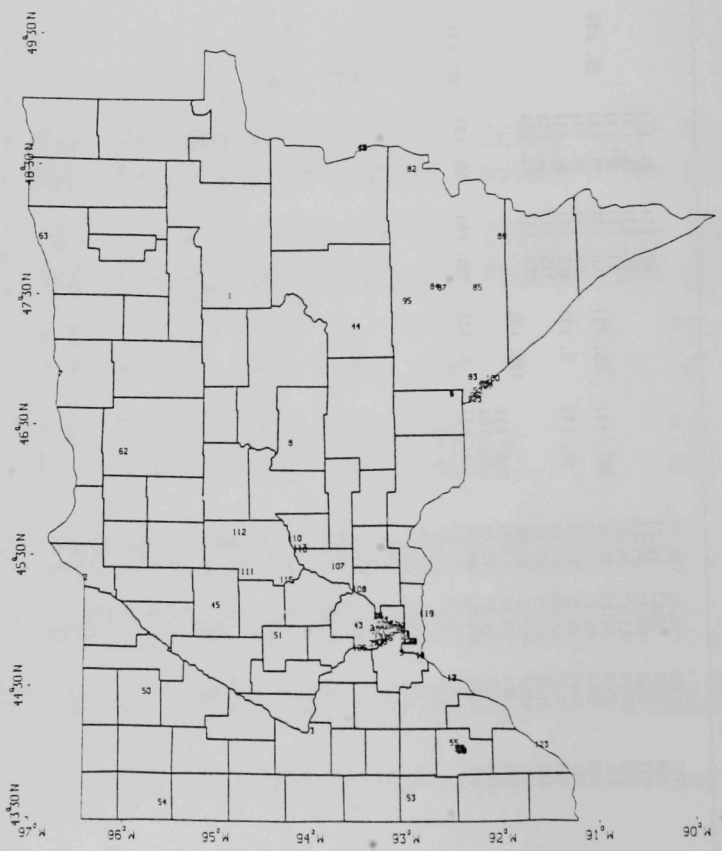


Fig. V.49. Minnesota: Locations of SAROAD Monitors
(See Table V.10 for Monitor Numbers)

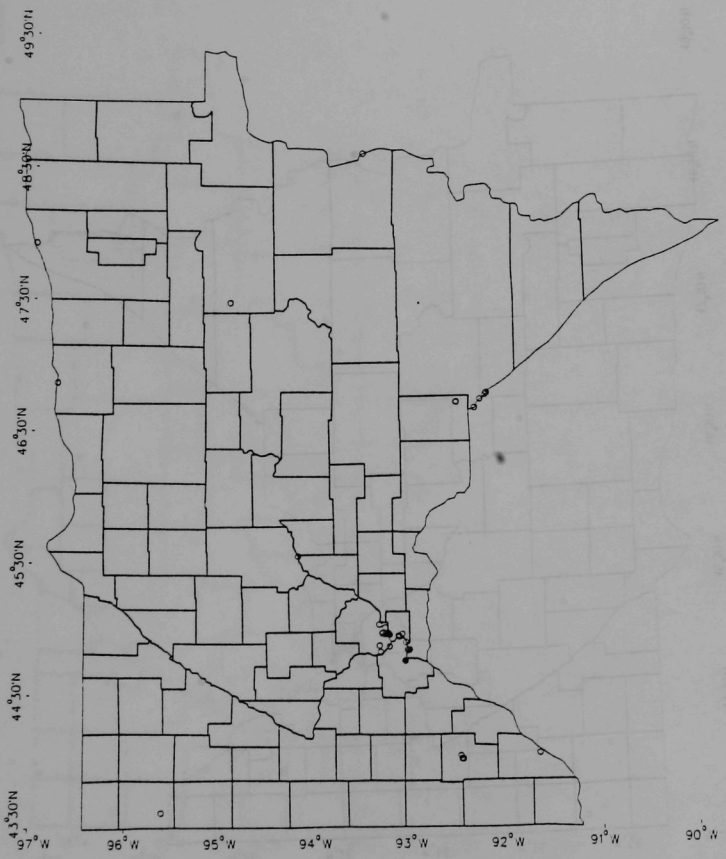


Fig. V.50. Minnesota: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

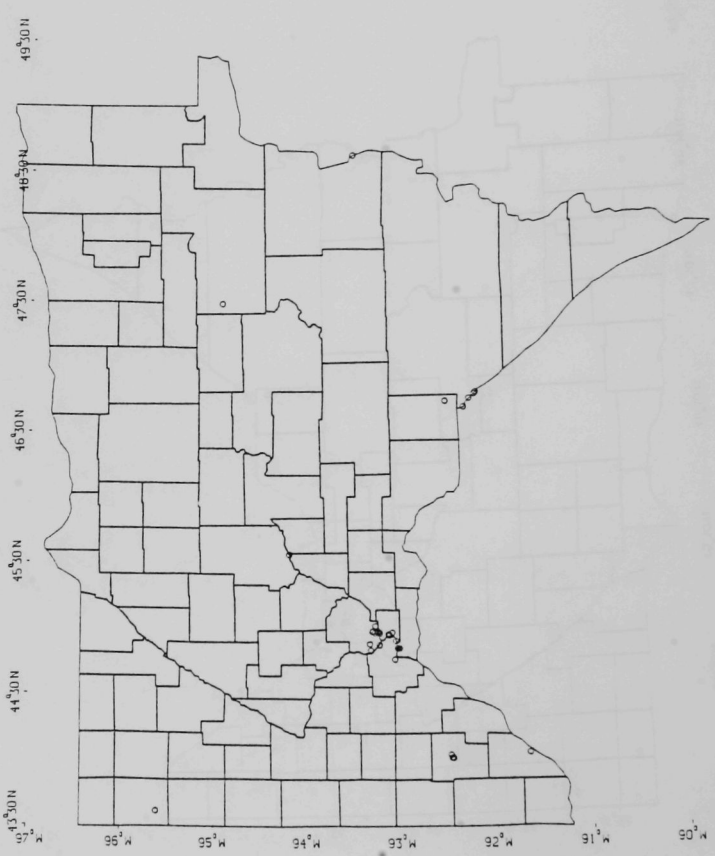


Fig. V.51. Minnesota: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

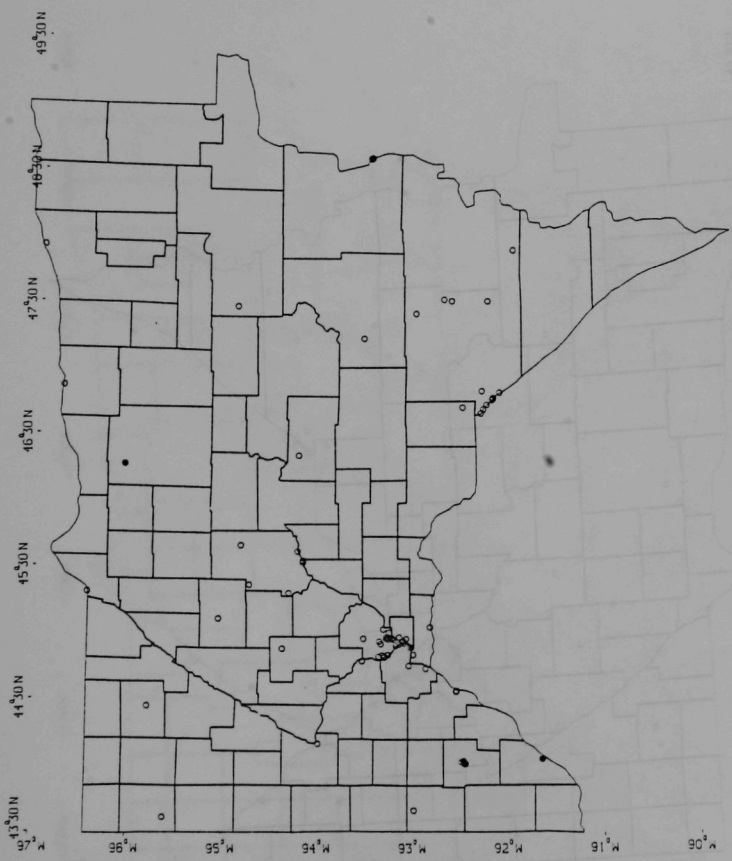


Fig. V.52. Minnesota: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

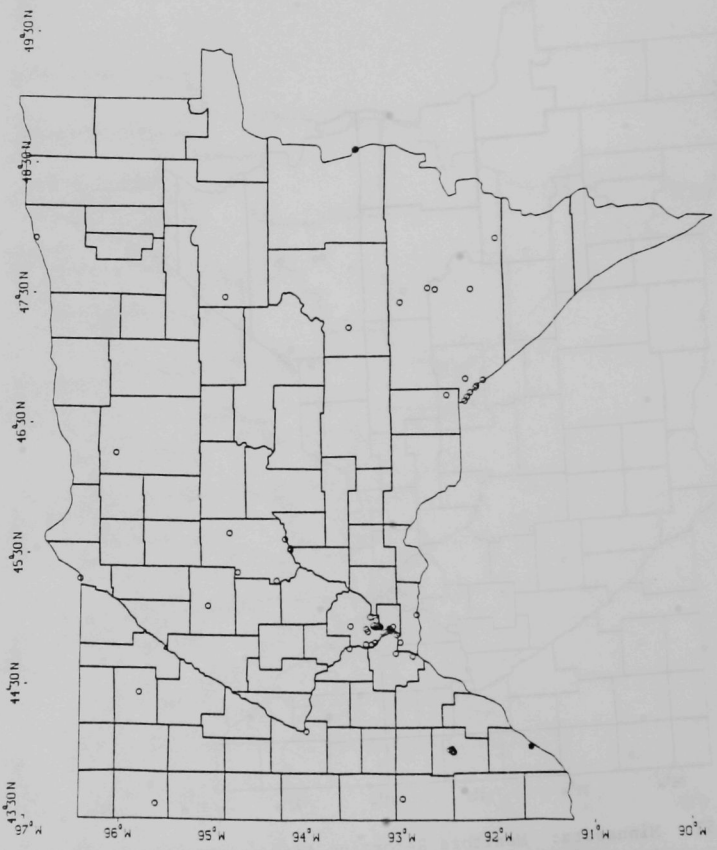


Fig. V.53. Minnesota: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

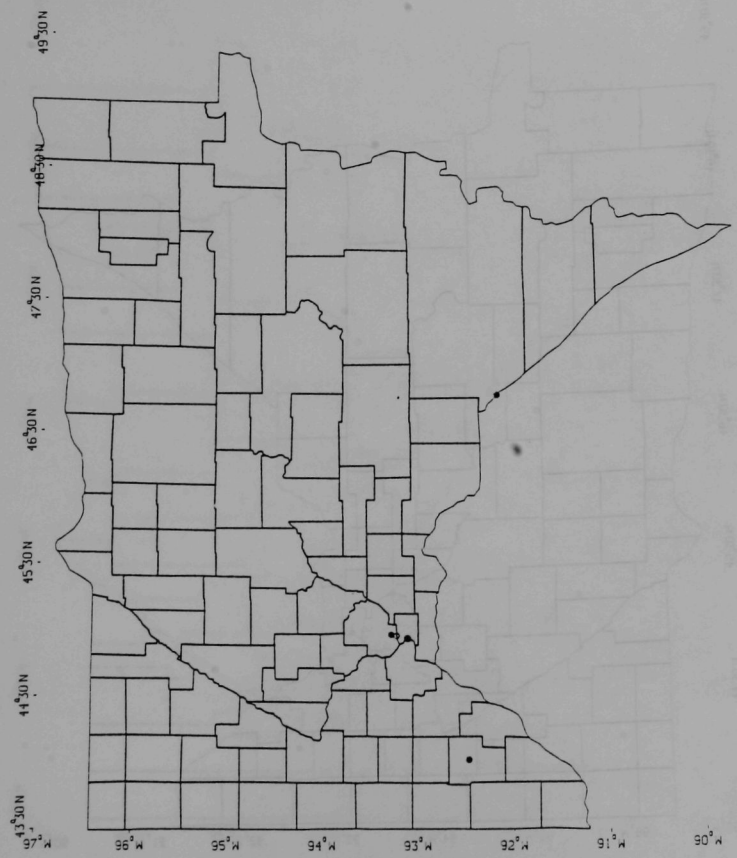


Fig. V.54. Minnesota: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

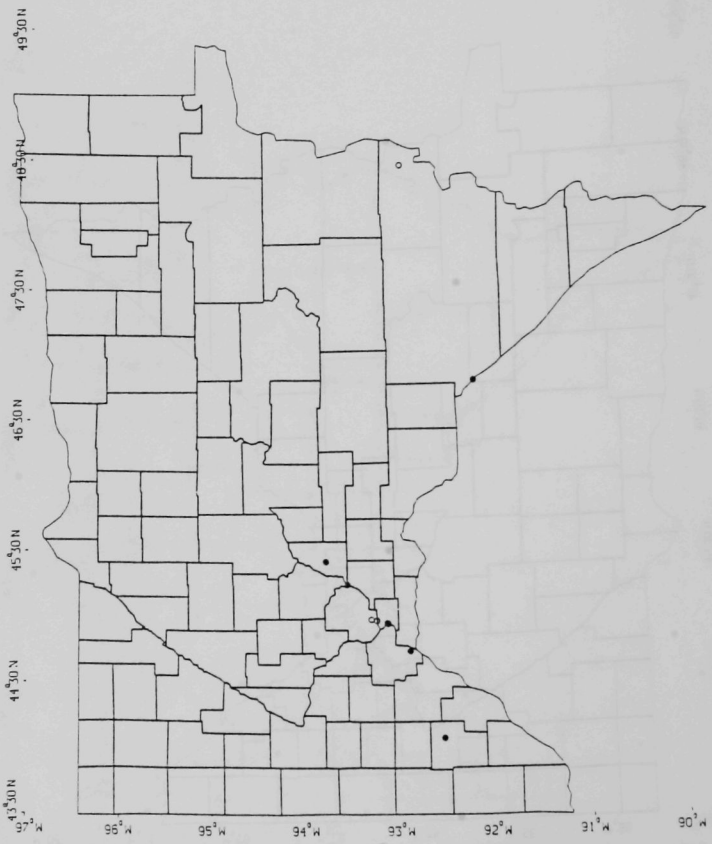


Fig. V.55. Minnesota: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

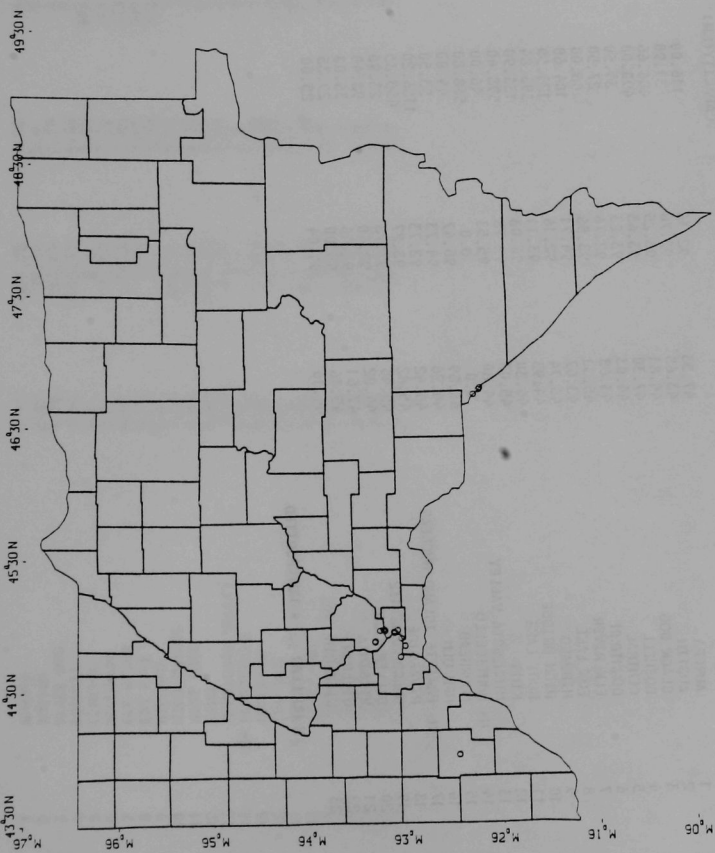


Fig. V.56. Minnesota: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table V.11. Minnesota: Power Plant Data

PLANT #	PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1	AURORA	47.53	92.16	116.00	0.0
2	AUSTIN	43.68	92.76	31.90	0.0
3	BLACK DOG	44.81	93.25	433.66	0.0
4	BOSWELL	47.30	93.63	490.00	0.0
5	CENTRAL	44.03	93.23	34.50	0.0
6	DOWNTOWN	43.68	92.76	27.50	0.0
7	ELK RIVER	45.30	93.56	46.00	0.0
8	FOX LAKE	43.67	94.71	104.60	0.0
9	HIBBARD	46.74	92.16	124.50	0.0
10	HIGH BRIDGE	44.93	93.11	393.84	0.0
11	HOOT LAKE	46.30	96.03	136.90	0.0
12	KING	45.03	92.78	598.40	0.0
13	MINNESOTA VALLEY	44.80	95.53	46.00	0.0
14	N* MONTICELLO	0.0	0.0	568.80	0.0
15	MOORHEAD	46.89	96.47	44.00	0.0
16	NEW ULM	44.26	94.73	53.50	0.0
17	N PRAIRIE ISLAND NUCLEAR	44.42	92.73	1136.20	0.0
18	RIVERSIDE	45.02	93.27	455.85	0.0
19	SHERBOURNE 1&2	45.46	93.78	23.90	0.0
20	SILVER LAKE	44.02	92.40	98.40	0.0
21	VIRGINIA	47.61	92.46	36.00	0.0
22	WILLMAR	45.16	95.00	29.35	0.0
23	WILMARTH	44.16	94.04	25.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.12. Minnesota: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	AURORA	1.12	373.20	1.56	4.00	0.0
2	AUSTIN	2.05	27.90	0.0	0.0	814.10
3	BLACK DOG	1.53	946.09	0.50	3.75	1929.69
4	BOSWELL	1.04	1644.40	0.35	9.20	0.0
5	CENTRAL	0.0	0.0	3.50	104.20	1050.60
6	DOWNTOWN	2.27	14.20	2.00	69.70	1136.40
7	ELK RIVER	4.00	25.50	1.00	28.60	195.70
8	FOX LAKE	0.72	9.90	1.68	195.70	2210.30
9	HIBBARD	0.0	0.0	1.50	364.40	423.60
10	HIGH BRIDGE	1.36	804.53	0.50	1.53	2127.92
11	HOOT LAKE	0.76	688.60	0.50	1.89	0.0
12	KING	2.49	1459.22	0.0	0.0	0.0
13	MINNESOTA VALLEY	1.43	64.81	0.50	0.82	477.36
14	N* MONTICELLO	0.0	0.0	0.0	0.0	0.0
15	MOORHEAD	0.60	1.79	0.10	1.58	0.0
16	NEW ULM	1.90	34.10	0.39	5.90	959.50
17	N PRAIRIE ISLAND NUCLEAR	0.0	0.0	0.0	0.0	0.0
18	RIVERSIDE	1.17	915.73	0.50	15.81	2220.50
19	SHERBOURNE 1&2	0.0	0.0	0.0	0.0	0.0
20	SILVER LAKE	1.96	117.00	0.0	0.0	1623.00
21	VIRGINIA	0.54	121.16	0.0	0.0	0.0
22	WILLMAR	1.41	33.61	0.0	0.0	377.11
23	WILMARTH	0.72	27.59	0.0	0.0	614.77

N NUCLEAR * NOT PLOTTED

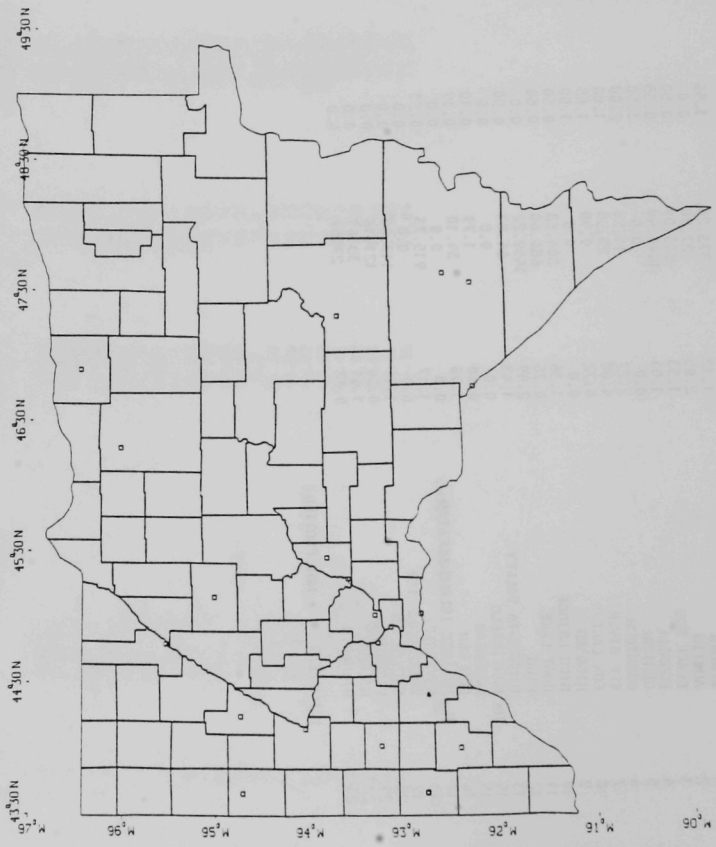


Fig. V.57. Power Plant Locations (Square = Fossil Fuel: Shaded, $\geq$1000 MW; Open, <1000 MW. Triangle = Nuclear)

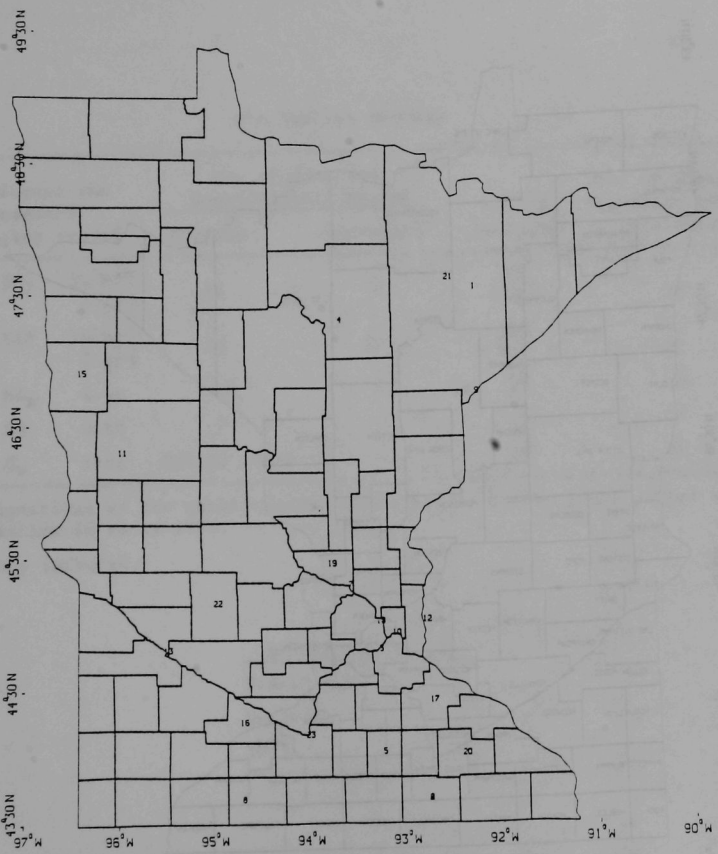


Fig. V.58. Power Plant Key (See Tables V.11 and V.12 for Identification and Fuel Use Data)

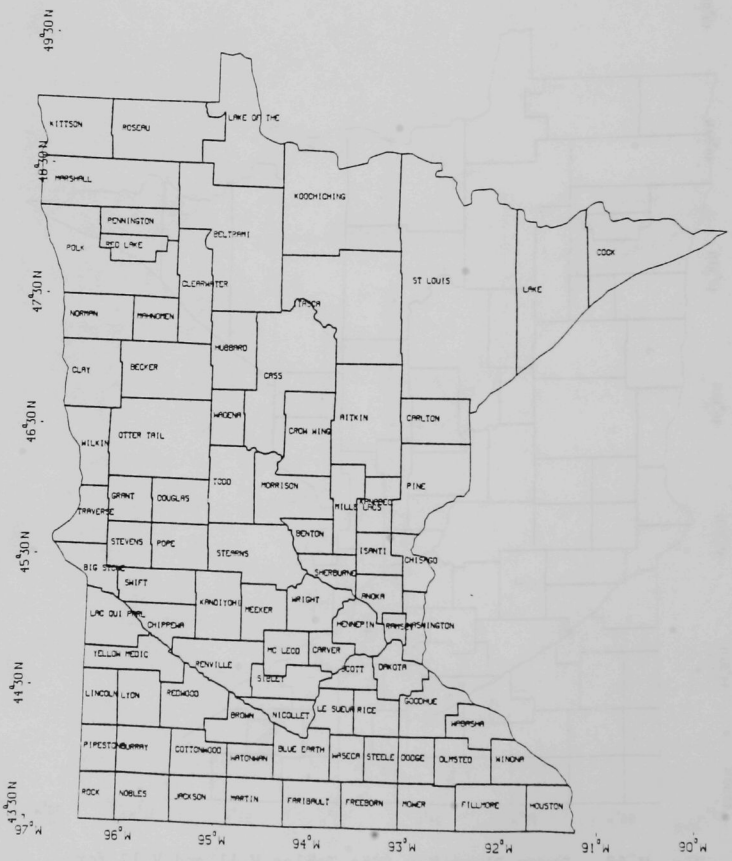


Fig. V.59. Minnesota: Key to Counties

REGION V: OHIO

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a]		No. of Monitors	No. of Monitors Recording Primary Violations
		Primary	Secondary		
SO_2	24 hr	18	2	180	7
	1 yr			104	10
TSP	24 hr	25	16	330	36
	1 yr			241	61
NO_x	1 yr	0[b]	-	85	0
CO	8 hr	7	-	15	8
O_x	1 hr	2/3 of state	-	28	22

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	33
Nuclear	3
Total	36

OHIO (Draft SIP, to be reviewed)

I. SOURCES OF THE PROBLEM

Ohio is a major industrial state in the Midwest, producing more electric power by coal combustion than any other state in the U.S. Ohio has had a history of difficulty in achieving an acceptable, enforceable SIP, particularly one for SO_2. In 1972, a SO_2 SIP (submitted under the requirement of the 1970 Clean Air Act Amendments) was submitted, approved by EPA, challenged by a number of Ohio utilities, and subsequently withdrawn after a court vacated the approval. After a continuing series of proposed plans and legal action in 1976, the USEPA enacted a plan for the state. This plan was also challenged by individual and utility petitioners and finally became effective in May 1977. In 1978-79, the Ohio EPA prepared and submitted a revised SO_2 plan for nonattainment areas, in accordance with the 1977 Clean Air Act Amendments. Initially, EPA found three major deficiencies in the plan:

1. The Ohio plan uses only a 30-day averaging period to calculate the percent of sulfur in fuel, as an indication of compliance with the regulations. The submittal does not contain a demonstration that such an averaging period will protect the 3-hour and 24-hour NAAQS for sulfur dioxide.
2. The methodology used by Ohio EPA in developing the regulations does not assure that the standards are protected in the areas of high SO_2 impact. The plan does not include the highest SO_2 levels identified in previous U.S. EPA analyses and utilized by U.S. EPA in setting their emission limitations.
3. The Ohio plan does not take into consideration the adjustments in smoke stack emission temperatures necessary to reflect operating conditions other than maximum. As a result, it is likely that plume rise is overpredicted and pollution impacts are underpredicted. Therefore, the plan cannot ensure protection of the NAAQS for sulfur dioxide.

Subsequently, the 30-day averaging technique has been judged acceptable under certain conditions. The SIP is still undergoing review at the EPA regional office as of February, 1980.

The SIPs for O_x and CO were submitted to EPA Region V in November 1979; the TSP plan has not yet been submitted. The following description,

consequently, is based on conversations with staff of the Ohio EPA and the EPA Region V office.

Ohio has designated nonattainment areas for SO_2, TSP, CO, and O_x. Since there are so many industrial and utility facilities in the state, it is impossible to discuss in detail the causes of particular nonattainment problems area-by-area, especially for TSP and SO_2. To give some idea of the scale of the problem, the 1976 EPA SO_2 plan proposed emission limitations on major sources, covering 40 utilities and over 100 industrial facilities. These were only the major sources to be subject to control in 55 urban counties of the state -- no controls were required for existing sources in the rest of the 88 counties.

Primary SO_2 nonattainment areas were designated around the following major industrial/urban centers: Toledo (Lucas and Wood Counties); Sandusky (Erie Co.); Cleveland (Cuyahoga, Medina, and Lake); Lorain (Lorain Co.); Akron/Canton (Summit and Stark Counties, south of Cleveland); Youngstown (Mahoning, Trumbull, and Columbiana Counties -- now in attainment following the closing of a large portion of Youngstown's Sheet & Tubing Co. plant); Lima (Allen Co. -- a limited area); Steubenville (Jefferson Co.); Cincinnati (Hamilton County); Dayton (Montgomery and Green Counties); Columbus (the state capital in Franklin and Pickaway Counties); Marion (Marion County); Fosteria (in Seneca County -- a small area); Athens (in Athens Co. -- redesignated to attainment); and the town of Belpre (Washington Co. -- a small area). In addition, SO_2 nonattainment areas have been designated in the vicinity of major utilities: Harrison Township in Muskingum County (site of Ohio Power's Philo plant); Franklin Township in Coshocton County (site of C and SOE's Conesville plant); and Pierce Township in Clermont County (site of Cleveland G & E's Beckjord plant). There are two secondary SO_2 nonattainment areas, also associated with utility plants: Galliapolis, (in Gallia County, on the Ohio River, (site of Ohio Valley Electric Co.'s Kyger Creek plant) and in Morgan and Washington Counties (near the site of Ohio Power's Muskingum Plant).

TSP nonattainment areas (both primary and secondary) follow the Ohio River Basin from south of Youngstown to the south-central border with Kentucky (Gallia and Lawrence Counties). In addition, primary areas (surrounded by

secondary violation areas) have been designated in Cincinnati, Cleveland, Youngstown, Dayton, Toledo, Akron, Columbus, and Canton.

CO nonattainment areas have been designated around the center of Cincinnati, Dayton, Columbus, Toledo, Cleveland, Youngstown and Steubenville. O_x nonattainment areas cover from 2/3 to 3/4 of the state. There are no NO_x nonattainment areas.

II. ATTAINMENT STRATEGIES

A. SO_2

The EPA Region V office has provided a summary of the current (Nov. 1979) status of SO_2 compliance strategies for existing coal-fired power plants. The summary is appended below. Note that in the "comment" column of Table V.12-A the indication "USEPA Class A stability, enforcement stayed" refers to a court required stay on implementation of the limitations, pending determination of the appropriate parameters for the air quality model used.

B. TSP, CO, & O_x

Discussion of strategies to be provided, after review of Ohio's delayed submittals.

III. NEW SOURCE REVIEW

Ohio expects to be implementing the EPA emission offset policy, with a 1.2:1 offset ratio preferred.

A summary* of the current status of SO_2 compliance strategies for individual coal-fired power plants is contained in the following paragraphs and in Table V.12-A.

- Ohio Edison: The USEPA has been working with Ohio Edison concerning extensions of the final compliance date past October 19, 1979. On October 10, 1979, USEPA announced that it was granting extensions for the Sammis Plant (Stratton, Ohio) until September 1, 1980, at units 5 through 7, and March 1, 1980, at units 1 through 4. For Niles (Niles, Ohio) and Edgewater (Lorain, Ohio) the extensions are until July 1, 1980.
- Toledo Edison: The USEPA is considering a revision to the federally-promulgated SO_2 plan for three Toledo Edison plants: Bayshore (Oregon, Ohio), Acme (Toledo,

*U.S. Environmental Protection Agency, *SO_2 Control in Ohio: Issues and History*, pp. 4, 7-11 (Oct. 11, 1979).

Ohio), and Water Street (Toledo, Ohio). Such a revision to the emission limitations would be based on a reanalysis of the area submitted by Toledo Edison.

- Columbus and Southern Ohio: The USEPA is considering a revision to the federally-promulgated SO_2 plan for the Poston Plant (Athens, Ohio) based on a new analysis of the area proposed by Columbus and Southern Ohio.

- Cleveland Electric Illuminating Company: The USEPA proposed a revision to the federally-promulgated emission limitations for the Avon Lake (Avon Lake, Ohio) and Eastlake (Willoughby, Ohio) plants. The revisions are based on air quality measurements in the vicinity of the plants and on data submitted indicating that the model used in the original regulation was not appropriate for the lakeside location of the plants.

- Ohio Power and Ohio Valley Electric Company: The USEPA is working closely with a number of American Electric Power (AEP) plants to resolve problems. The USEPA is considering approval of the Ohio EPA regulations for Ohio Power's Cardinal Power Plant (Brilliant, Ohio). The Ohio EPA regulations contain a special section that specifies a 24-hour averaging time for sulfur in fuel with two exceedances allowed in any 30-day running period. The USEPA is also working with Ohio Power to resolve problems at the Muskingum River Plant (Beverly, Ohio).

- Ohio Power Gavin Plant (Gavin, Ohio) and the Ohio Valley Electric Company Kyger Creek Plant (Cheshire, Ohio): these AEP facilities have already certified final compliance with the federally-promulgated SO_2 regulations on a 24+2-hour average basis. The federal emission limitations for these plants are identical to that of the state plan.

Table V.12-A. Comparison of Existing Federally-Promulgated Ohio SO_2 Regulations and the Proposed Ohio EPA SO_2 Regulations

Plant Name	Plant Capacity[a] (MW)[b]	Existing USEPA Regulations (lb SO_2/MM Btu)		Proposed Ohio EPA Regulations (lb SO_2/MM Btu)	Comments
		General Limit	Optional Limit		
CG & E, Beckjord	1415	2.02	Blrs[b] 1-4: 1.84 Blrs 5,6: 7.4	Blrs 1-6: 6.0 Turbines 7-10: 1.2	
CG & E, Miami Fort	1063	Blr 3: 0.30 Blrs 4,5,6: 3.30 Blr 7: 5.50 Blr 8: 1.20	None	3-1,3-2,4-1,4-2: 0.5 5-1,5-2,6-7: 5.0 Unit 7: 5.5 Unit 8: 1.2	
CG & E, Dick's Creek	192	(Butler Co.)		Units 1-5: 0.5	USEPA has proposed regs for Butler Co. that will be revised
CEI, Avon Lake	1301	Units 1-4: 1.35 Units 6-9: 6.09	None	B001-B009: 1.35 B010-B014: 6.09	USEPA regs proposed 6-12-79
CEI, Ashtabula	640	Stks[b] 1-3: 2.40 Stk 4: 9.10 Stk 5: 8.20	None	Blrs 1-6: 2.4 Blr 7, Unit 5: 9.1 Pkg. Blr: 2.4 Plant C, Ashtabula Township, Blrs 1-4: 8.2	Lake Road
CEI, East Lake	1262	All Stks: 6.58	None	B001-B005: 6.58	USEPA regs proposed 6-12-79
CEI, Lake Shore	518	Unit 18: 1.30 Units 91-94: 1.90	None	Unit 18: 3.0 Units 91-94: 2.0	Ohio SO_2 regs specify seasonal reduced load
CEI, Canal Road Steam Plant	99[c]	All Stks: 1.37	None	Blrs 34-38: 1.5	
CEI, Hamilton Ave. Steam Plant	91[c]	All Blrs: 1.0	None	All Blrs: 1.0	
C & SOE, Poston	214	Blrs 1-4: 7.9 Blrs 5 & 6: 1.2 (NSPS)	None	Blrs 1-4: 7.9 Diesels 1-5: 0.52 Blrs 5,6: 1.2 (NSPS)	USEPA regulation to be proposed
C & SOE, Picway	166	All Stks: 6.04 Oil units: 0.85	Same	Blrs 7,8,9: 9.9 Unit #6 JET: 1.2	

[a]Information derived from Orbes Electrical Generating Unit Inventory.

[b]Abbreviations: MW = megawatts, Blr = boiler, Stk = stack.

[c]Plant capacity obtained from other sources.

Table V.12-A. (Cont'd)

Plant Name	Plant Capacity[a] (MW)[b]	Existing USEPA Regulations ($lb\ SO_2/MM\ Btu$) General Limit	Existing USEPA Regulations ($lb\ SO_2/MM\ Btu$) Optional Limit	Proposed Ohio EPA Regulations ($lb\ SO_2/MM\ Btu$)	Comments
C & SOE, Conesville	1592	Blrs[b] 1-4: 5.66 Blrs 5,6: 1.2 (NSPS)	Same	Blrs 1-4: Reserved Blrs 5,6:1.2 (NSPS) Diesels 1-5: 0.52 Aux Blr 4: 0.52	USEPA Class A stability, enforcement stayed OPEA Reserved regs
DP & L, J.M. Stuart	2452	All units and Blrs 1-4: 3.16	Same	Blrs 1-4: 3.3 Aux Blr & Diesels 1-4: 0.5	USEPA Class A stability, enforcement stayed
DP & L, Tait	461	All coal units: 1.25 All oil units: 0.65	None	Blrs 4,5: 1.8 Blrs 7-1,7-2,8-1,8-2: 0.5 Diesel units 1-4: 0.5	
DP & L, Hutchings	447	Coal units: 1.20 Oil units: 0.65	Same	Blrs 1-6: 1.6 Turbine 7: 0.5	
DP & L, Troy	NA	All units: 3.2	None	All units: 3.2	Plant is shut-down
Ohio Edison, Norwalk	26	All units: 8.0	None	All units: 6.9	
Ohio Edison, Toronto	172	All units: 8.1	None	All units: 8.1	
Ohio Edison, Burger	563	No regulations	None	Diesels A,B1, B2. Aux heating Blr: 1.2 Blrs 1-8: 9.02	USEPA - No regulation necessary
Ohio Edison, Sammis	2405	2.91	Units 1-4: 1.61 Units 5-7: 4.46	Blrs 1-4: 1.61 Blrs 5-7: 4.46 Diesels: 0.8 Auxiliary: 0.0	
Ohio Edison, Mad River	141	Blrs 1-3: 4.62 Turbine A & B: 1.00	Same	Blrs 1-4: 4.6 Turbine A & B: 1.0	
Ohio Edison, Edgewater	231	All units: 3.40	None	Blrs 11-13: Reserved Turbines A & B: Reserved	OEPA - Reserved regulations
Ohio Edison, Niles	265	All units: 5.41	Same	Blrs 1,2: 5.7 Turbine A: 0.5	
Ohio Edison, Gorge	96	All units: 4.07	None	Blrs 25,26: 4.2	USEPA regs proposed 9-27-78, to be promulgated

Table V.12-A. (Cont'd)

Plant Name	Plant Capacity[a] (MW)[b]	Existing USEPA Regulations ($lb\ SO_2/MM\ Btu$)		Proposed Ohio EPA Regulations ($lb\ SO_2/MM\ Btu$)	Comments
		General Limit	Optional Limit		
Ohio Edison, Beech St. Steam Plant	46[c]	All units: 2.79	None	Blrs 1-6: 4.8 Restricted load	USEPA regs proposed 9-27-78, to be promulgated. OEPA SO_2 regs specify seasonal reduced load. OE plans to shut down plant
Ohio Edison, N. Ave. Steam Plant	47[c]	All units: 2.0	None	Blrs 1-4: Reserved	
Ohio Edison, E. Palestine	12	4.4	None	All Blrs: 4.4	
Ohio Edison, Rockaway Steam Plant	30[c]	No regulations	None	All Blrs: 4.5	
Ohio Power, Gavin	2600	All units: 9.5	None	All units: 9.5	
Ohio Power, Cardinal	1200	Units 1,2: 7.08 Unit 3: 2.0	None	Units 1,2: 7.08 Unit 3: 2.0	USEPA Class A, but resolved with SIP revision. OEPA regulation is approvable as it contains special 24 + 2-hr averaging time for Cardinal
Ohio Power, Philo	395	1.14	Same	All Blrs: 1.4	Plant is shut down
Ohio Power, Muskingum	1507	6.48	Units 1-4: 9.72 Unit 5: 4.00	Blrs 1-5: 9.52 Aux Blr: 1.2	USEPA Class A stability, enforcement stayed
Ohio Power, Woodcock	38	All units: 4.38	None	Blrs 1-5: 1.8	
Ohio Valley Electric Corp., Kyger Creek	1085	All units: 8.20	None	Blrs 1-5: 8.2	
Toledo Edison, Stryker Substn.	20	No regulations	None	Turbine 1: 0.7	

Table V.12-A. (Cont'd)

Plant Name	Plant Capacity[a] (MW)[b]	Existing USEPA Regulations (lb SO_2/MM Btu)		Proposed Ohio EPA Regulations (lb SO_2/MM Btu)	Comments
		General Limit	Optional Limit		
Toledo Edison, Carpenter Rd.	100[c]	No regulations	None	Turbines 1-3: 0.7	Peaking Plant
Toledo Edison, Acme	322	Coal units: 1.20	None	Blrs 13,14,15,16,91, 92: 1.47	USEPA regs to be proposed
Toledo Edison, Bayshore	655	Coal Blrs: 1.94 Oil Blrs: 0.50	None	Blrs 1-4: 1.94 Peaker: 0.4	USEPA regs to be proposed
Toledo Edison, Water Street Steam Plant	70[c]	All Blrs: 1.00	None	All Blrs: 1.36	USEPA regs to be proposed
Bryan Munic. Utilities	24[c]	No regulations	None	Gas turbines 5 & 6: 0.5	
City of Cleveland, Lake Rd. Stn.	50	4.20	None	Blr 6 Restricted load: 4.7 Blrs 3,4,5: 0.0	
Columbus Munic. Light Plant	55	1.50	None	All Blrs: 0.0	
Dover Munic. Light Plant	36[c]	All Blrs: 4.6	None	Blrs 1-4: 4.6	
Hamilton Munic. Power	145	(Butler Co.)	None	Blr 1 Restr. load: 0.5 Blr 7 Restr. load: 0.5 Blrs 5,6: 0.0 Blr 8 Restr. load: 1.91 Blr 9: Reserved	USEPA has regs proposed for Butler Co. that will be revised; OEPA regs have seasonal reduced load
Napolean Munic. Light Plant	13[c]	All units: 0.0	None	Unit 5: 5.88	
Orrville Munic. Utilities	89	All Blrs: 7.0	None	All Blrs: 7.0	
Piqua Power Plant	63	4.78	Same	Blrs 4-6: 4.8 Ft #8 Oil Blr: 0.5	
Shelby Munic. L & P	39	All Blrs: 9.3	None	Blrs 1,2,4: 8.1 Blr 3: 0.0	
St. Mary's Munic.	21	No regulations	None	All Blrs: 6.5	

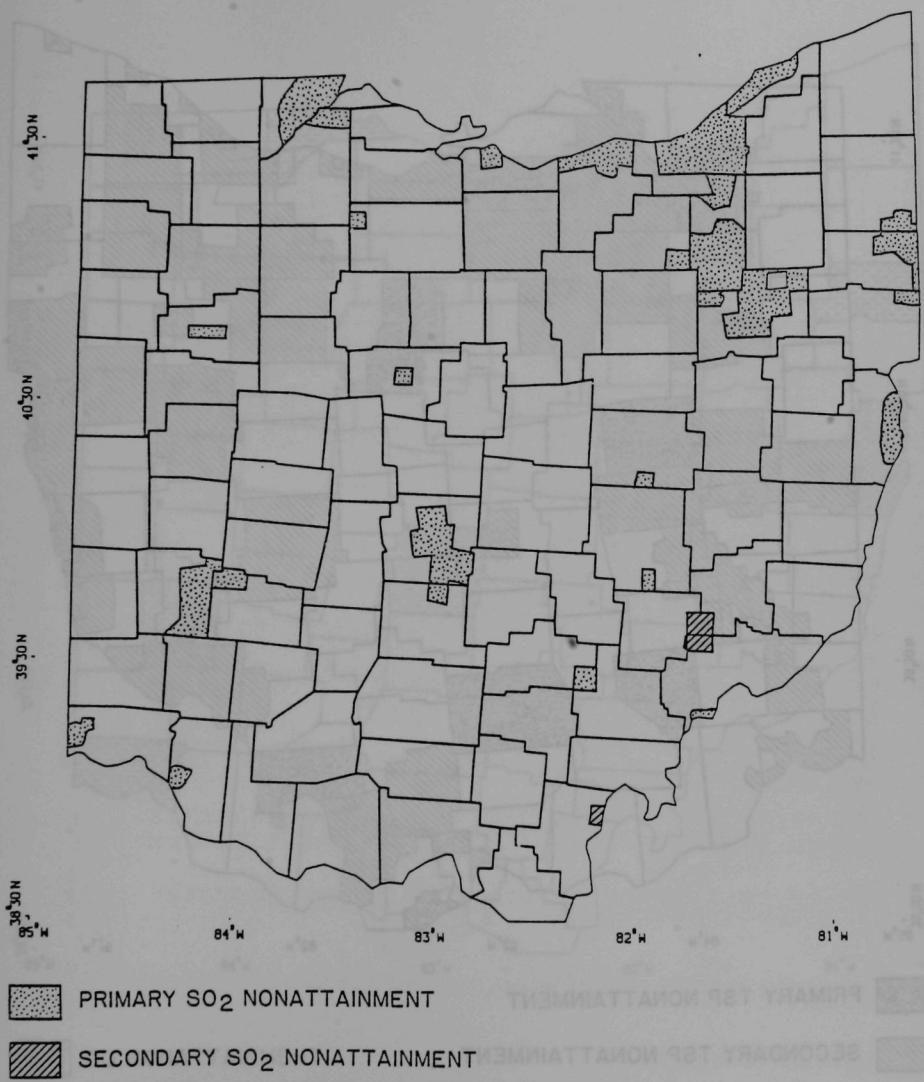
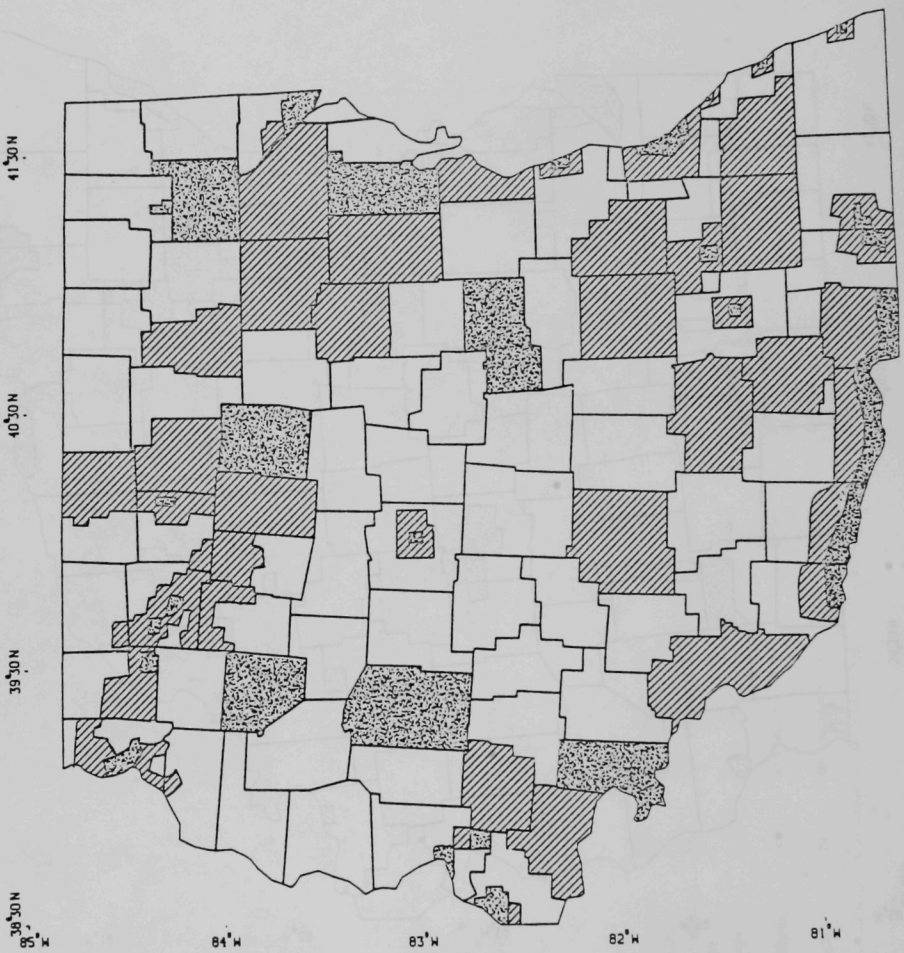


Fig. V.60. Ohio: SO_2 Nonattainment Areas as Designated May 1979



PRIMARY TSP NONATTAINMENT

SECONDARY TSP NONATTAINMENT

Fig. V.61. Ohio: TSP Nonattainment Areas as Designated May 1979

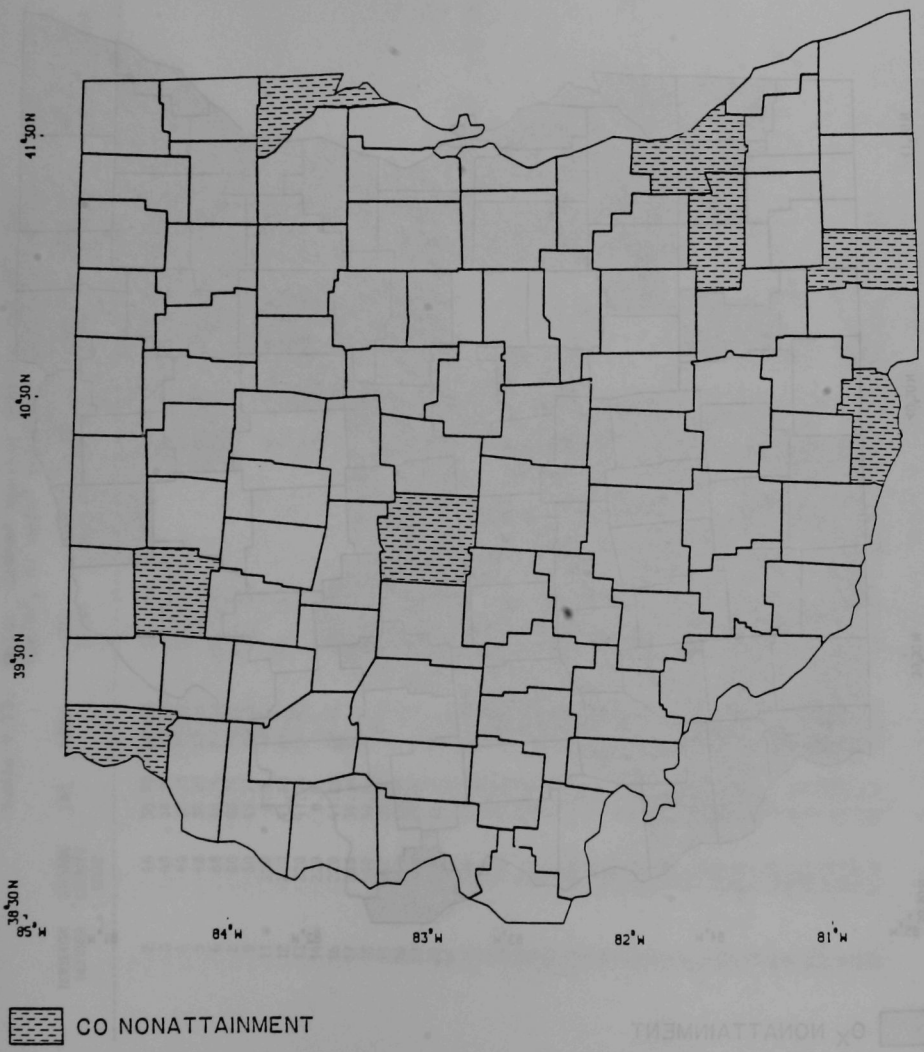
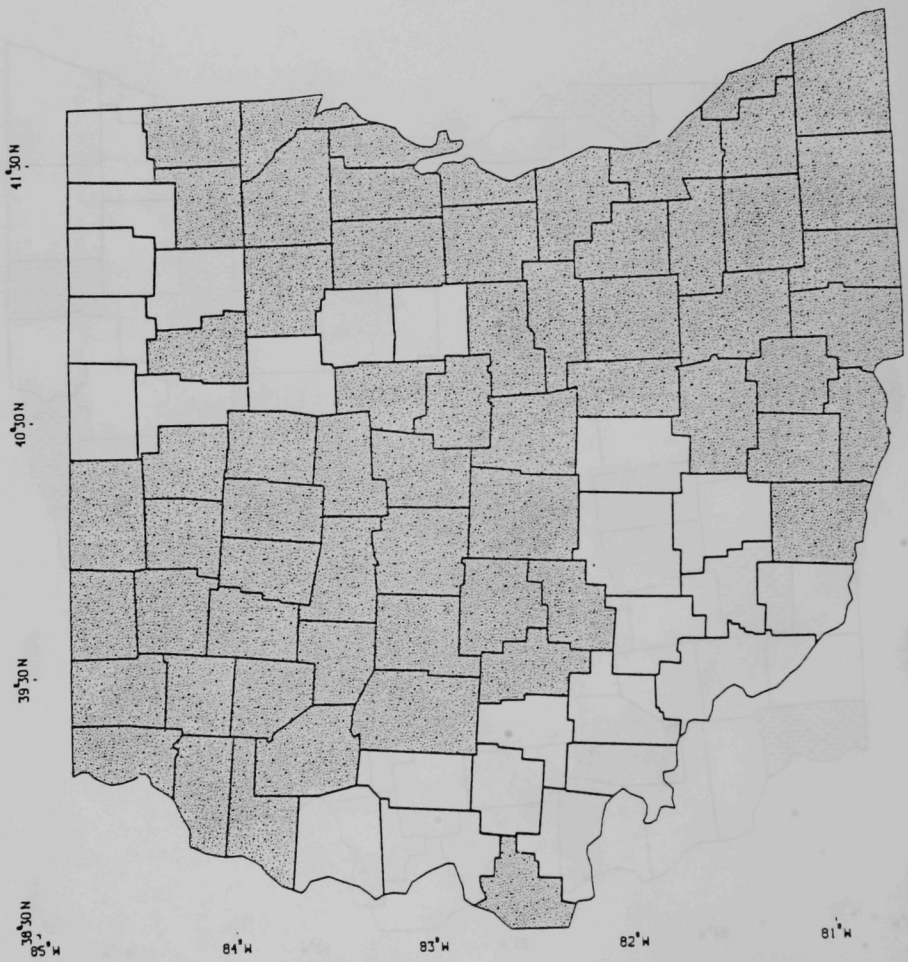


Fig. V.62. Ohio: CO Nonattainment Areas as Designated May 1979



O_X NONATTAINMENT

Fig. V.63. Ohio: O_x Nonattainment Areas as Designated May 1979

Table V.13. Ohio: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
2	40	38.75	83.61	37. (1)						
3	40	38.96	83.40			100. (1)	42. (1)			
4	40	38.61	83.66	52. (1)						
5	40	38.79	83.54			98. (1)	47. (1)			
6	80	40.74	84.10	121. (1)		136. (1)				
8	80	40.74	84.10	141. (1)						
9	80	40.73	84.11	17. (1)						
11 *	220	0.0	0.0			99. (1)	44. (1)			
12	220	41.83	80.76	202. (1)		139. (1)	69. (2)			
13	220	41.74	80.77			120. (1)	58. (2)			
14 *	220	0.0	0.0			122. (1)				
16	220	41.88	80.80	52. (1)		161. (1)	75. (2)			
17	260	39.34	82.11			116. (1)	62. (2)			
18	540	39.86	80.81	91. (1)		294. (3)	117. (4)			
19	540	39.97	80.75			151. (1)	83. (3)			
20	540	40.10	80.73	161. (1)	69. (2)	233. (3)	91. (3)	27. (1)		
21	540	40.09	80.89			105. (1)	51. (1)			
22	900	39.40	84.56	101. (1)	26. (1)	153. (1)	70. (2)	47. (1)		
24	900	39.34	84.54			143. (1)	69. (2)			
25	900	39.53	84.39	93. (1)					3. (1)	236. (4)
27	900	39.53	84.39			149. (1)	71. (2)			
28	900	39.49	84.35			134. (1)	65. (2)			
29	900	39.49	84.38			438. (4)	161. (4)			
30	900	39.51	84.40			144. (1)	79. (3)			
31	900	39.51	84.74	78. (1)	20. (1)	110. (1)	58. (2)	32. (1)		
32	1040	40.56	81.09			101. (1)	41. (1)			
33	1140	40.11	83.75			122. (1)	67. (2)			
34	1260	39.95	83.76	38. (1)	13. (1)	131. (1)	53. (1)			
35	1260	39.93	83.81					30. (1)		
36	1260	39.92	83.81	13. (1)					11. (3)	
37	1260	39.91	83.77	41. (1)	14. (1)	105. (1)	53. (1)	25. (1)		
38	1260	39.95	83.76					17. (1)		
39	1260	39.92	83.81	93. (1)						
40	1260	39.93	83.81	76. (1)	26. (1)	122. (1)	62. (2)			
41	1260	39.92	83.81							108. (1)
42	1260	39.94	84.02			114. (1)	61. (2)			
43	1280	39.03	84.28			153. (1)	57. (2)			
44	1280	39.08	84.18	60. (1)	15. (1)	118. (1)	57. (2)	21. (1)		255. (4)
45	1280	39.17	84.30			123. (1)	59. (2)			
47	1340	39.29	83.99			106. (1)				
48	1340	39.44	83.83			179. (1)				
49	1440	40.83	80.54			163. (1)	57. (2)			
50	1440	40.64	80.54			296. (3)	120. (4)			
51	1440	40.62	80.58	395. (3)	119. (4)	258. (2)	114. (4)	41. (1)		

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
53	1440	40.77	80.77			151. (1)	77. (3)			
54	1440	40.61	80.65			210. (2)	109. (4)			
55	1440	40.90	80.90	128. (1)	68. (2)	159. (1)	72. (2)	24. (1)		
56	1440	40.89	80.85			144. (1)	73. (2)			
57	1520	40.24	81.87	137. (1)		181. (1)				
58	1600	41.50	81.61						25. (4)	
59	1600	41.48	81.68	278. (2)		456. (4)				
60	1600	41.48	81.68	408. (3)	97. (3)	337. (4)		73. (1)		
61	1600	41.55	81.57							341. (4)
62	1600	41.49	81.68			383. (4)	146. (4)			
63	1600	41.49	81.68	431. (3)	72. (2)	393. (4)		77. (2)	9. (2)	186. (3)
64	1600	41.50	81.69	125. (1)		334. (4)				
65	1600	41.59	81.55			185. (1)				
66	1600	41.48	81.70	204. (1)		265. (3)				
67	1600	41.48	81.70	180. (1)	67. (2)	235. (2)		68. (1)		
68	1600	41.45	81.66	373. (3)		356. (4)				
69	1600	41.45	81.66	283. (2)	93. (3)	334. (4)	139. (4)	67. (1)		
71	1600	41.48	81.61	153. (1)	54. (1)	110. (1)		62. (1)		
72	1600	41.43	81.72					59. (1)		
75	1600	41.46	81.64	138. (1)	54. (1)	190. (1)	89. (3)	64. (1)		
76	1600	41.55	81.57	114. (1)	40. (1)	92. (1)		64. (1)		
77	1600	41.50	81.62	96. (1)						
78	1600	41.50	81.62	142. (1)	62. (2)	243. (2)		79. (2)		
80	1600	41.43	81.72	141. (1)	48. (1)	146. (1)	65. (2)			
81	1600	41.46	81.75			173. (1)	69. (2)			
82	1600	41.52	81.62	101. (1)	43. (1)	235. (2)		69. (1)		
83	1600	41.45	81.60	133. (1)		104. (1)				
84	1600	41.48	81.67	227. (1)		303. (3)				
85	1600	41.48	81.67	266. (1)	79. (2)	340. (4)	149. (4)	75. (1)		
87	1600	41.52	81.65	145. (1)		223. (2)				
88	1600	41.52	81.65	141. (1)	54. (1)	225. (2)		77. (2)		
90	1600	41.48	81.75	150. (1)	46. (1)	165. (1)	71. (2)	71. (1)		
92	1600	41.44	81.72	171. (1)	50. (1)	135. (1)	69. (2)	66. (1)		
94	1600	41.45	81.70	193. (1)		266. (2)				
95	1600	41.45	81.70	365. (2)	57. (1)	194. (1)	93. (3)	71. (1)		
96	1600	41.47	81.66	223. (1)		312. (3)				
97	1600	41.47	81.66	237. (1)	91. (3)	289. (3)		84. (2)		
99	1600	41.45	81.81	129. (1)		177. (1)	67. (2)			
100	1600	41.45	81.56	154. (1)	48. (1)	87. (1)		59. (1)		
101	1600	41.59	81.50			157. (1)				
102	1600	41.60	81.51			179. (1)				
103	1600	41.33	81.64			72. (1)				
104	1600	41.41	81.94			95. (1)				
105	1600	41.41	81.50			188. (1)				

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
106	1600	41.49	81.50			131. (1)				
107	1600	41.39	81.73			124. (1)				
109	1600	41.46	81.83			73. (1)				
110	1640	40.10	84.63	60. (1)	25. (1)	110. (1)	59. (2)	24. (1)		
111	1640	39.14	84.55	58. (1)		118. (1)				
113	1720	41.28	84.34	118. (1)		211. (2)				
114	2000	41.45	82.72			139. (1)				
116	2000	41.43	82.71	78. (1)		249. (2)				
118	2220	39.89	83.07			133. (1)				
120	2220	39.98	83.05			157. (1)				
122	2220	39.95	83.12			101. (1)				
125	2220	39.96	83.01	151. (1)	38. (1)	256. (2)	78. (3)			
127	2220	39.96	83.01	99. (1)		116. (1)	63. (2)			
128	2220	39.96	83.01			256. (2)	80. (3)			
130	2220	39.96	83.01	71. (1)	25. (1)			52. (1)		
132	2220	40.09	82.96			109. (1)				380. (4)
133 *	2220	0.0	0.0			118. (1)				
134	2220	39.95	82.88			157. (1)				
135	2220	40.07	83.06			101. (1)				
137	2220	40.02	82.96			125. (1)				
138	2220	39.93	82.90			133. (1)				
139	2220	39.96	82.99	96. (1)	39. (1)			58. (1)		306. (4)
140	2220	39.96	82.99						11. (3)	
142	2220	39.99	83.00			130. (1)				
144	2220	40.00	82.99	161. (1)	28. (1)	231. (2)	87. (3)	50. (1)		
146	2220	39.97	83.00			140. (1)				
148	2220	40.00	82.96	76. (1)	14. (1)	167. (1)	72. (2)	38. (1)		
150	2220	40.04	83.00			70. (1)				
152	2220	40.06	82.99			130. (1)				
154	2220	40.00	83.04	177. (1)		127. (1)	65. (2)			223. (4)
156	2220	40.00	82.99			231. (2)	91. (3)			
157	2220	39.96	83.01					53. (1)		
158	2320	38.82	82.19			117. (1)	53. (1)			
160	2320	38.95	82.12			145. (1)	61. (2)			
162	2380	41.39	81.31			103. (1)	50. (1)			
163	2380	41.46	81.07			119. (1)	61. (2)			
164	2380	41.39	81.31	205. (1)	57. (1)					
165	2380	41.59	81.20	108. (1)	31. (1)	125. (1)	56. (1)			
166	2580	39.79	84.03	38. (1)	13. (1)	131. (1)	57. (2)	25. (1)		
167	2580	39.81	84.03			270. (3)	70. (2)			
169	2580	39.81	84.03	128. (1)	37. (1)			53. (1)		
170	2580	39.80	83.89			105. (1)	54. (1)			
171	2580	39.70	83.93					30. (1)		

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
173	2580	39.70	83.93	39. (1)	13. (1)	123. (1)	58. (2)			
174	2680	40.04	81.60			99. (1)				
175	2720	39.16	84.46			139. (1)	70. (2)			
178	2720	39.20	84.55			139. (1)	59. (2)			
180	2720	39.11	84.51	49. (1)	22. (1)	184. (1)	70. (2)	58. (1)		
181	2720	39.11	84.51			140. (1)	72. (2)			
183	2720	39.14	84.39			107. (1)	59. (2)			
184	2720	39.29	84.55	72. (1)	17. (1)	109. (1)	50. (1)			
185	2720	39.29	84.45							284. (4)
186 *	2720	0.0	0.0			121. (1)	66. (2)			
187	2720	39.29	84.55					43. (1)		
188	2720	39.23	84.45			231. (2)	94. (4)			
189 *	2720	0.0	0.0			184. (1)	60. (2)			
190	2720	39.13	84.71	91. (1)	35. (1)	144. (1)	67. (2)			
191	2720	39.16	84.75			151. (1)	74. (2)			
193 *	2720	0.0	0.0	136. (1)	23. (1)			54. (1)		
194	2720	39.26	84.82			112. (1)	65. (2)			
195 *	2720	0.0	0.0	158. (1)		90. (1)			7. (1)	412. (4)
196	2720	39.07	84.34			147. (1)	65. (2)			
197	2720	39.13	84.36			112. (1)	47. (1)			
198	2720	39.13	84.71					53. (1)		
200	2720	39.17	84.50			138. (1)	70. (2)			
201	2720	39.18	84.49	71. (1)	22. (1)	219. (2)	123. (4)	58. (1)		
204	2720	39.18	84.36	55. (1)	16. (1)	119. (1)	62. (2)	59. (1)		
206	2720	39.14	84.55							251. (4)
208	2720	39.21	84.48	182. (1)	46. (1)	138. (1)	70. (2)		8. (2)	
210	2720	39.14	84.55					59. (1)		
211	2720	39.14	84.51	68. (1)	23. (1)	90. (1)		53. (1)		
212	2720	39.11	84.42			117. (1)	54. (1)			
213	2720	39.13	84.54			159. (1)	87. (3)			
214	2720	39.13	84.50			125. (1)	66. (2)			
216	2720	39.19	84.48			183. (1)	93. (3)			
217	2720	39.11	84.59			138. (1)	66. (2)			
218	2720	39.15	84.42			115. (1)	62. (2)			
220	2720	39.21	84.48							288. (4)
221	2720	39.23	84.48			116. (1)	55. (1)			
223	2740	41.03	83.65	64. (1)		215. (2)				
224 *	2820	41.39	78.13	159. (1)		274. (3)				
225	2940	39.53	82.38			135. (1)				
226	3120	39.06	82.64			97. (1)				
227	3160	40.17	80.70			238. (2)	79. (3)			
228	3160	40.36	80.62							343. (4)
229	3160	40.27	80.62			282. (3)	118. (4)			
231	3160	40.43	80.77			235. (2)	67. (2)			
232	3160	40.36	80.62	388. (3)	112. (4)	636. (4)	135. (4)	39. (1)	14. (4)	
233	3160	40.45	80.61			266. (3)	94. (4)			
236	3160	40.37	80.61			314. (3)	134. (4)			

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
237	3160	40.38	80.67			286. (3)	95. (4)			
238	3160	40.27	80.62	270. (1)	95. (3)			25. (1)		
239	3160	40.36	80.62	135. (1)		195. (1)		45. (1)		
240	3160	40.32	80.61			455. (4)	147. (4)			
241	3280	41.69	81.38			142. (1)	59. (2)			
242	3280	41.75	81.22	133. (1)	32. (1)	137. (1)	57. (2)			
243	3280	41.69	81.17			113. (1)	43. (1)			
244	3280	41.82	81.06			137. (1)	53. (1)			
246	3280	41.77	81.05	111. (1)	29. (1)	109. (1)	49. (1)			
249	3280	41.72	81.24			166. (1)	73. (2)			
251	3280	41.61	81.47	156. (1)	48. (1)	114. (1)	65. (2)			
252	3280	41.58	81.47			100. (1)	48. (1)			
253	3280	41.63	81.43	161. (1)	42. (1)	131. (1)	67. (2)			
254	3280	41.75	81.27	160. (1)		114. (1)				
255	3280	41.72	81.24	277. (2)	87. (3)					451. (4)
256	3280	41.65	81.44	158. (1)	44. (1)	147. (1)	67. (2)			
258	3280	41.67	81.42			138. (1)	69. (2)			
259	3280	41.72	81.24			159. (1)	70. (2)			
260	3380	38.63	82.41			120. (1)	45. (1)			
261	3380	38.41	82.53			157. (1)	63. (2)			
262	3380	38.42	82.58			380. (4)	103. (4)			
263	3380	38.46	82.32			124. (1)	53. (1)			
264	3380	38.55	82.64			163. (1)	67. (2)			
266	3380	38.54	82.67			175. (1)	68. (2)			
267	3380	38.52	82.67	47. (1)	17. (1)	275. (3)				
268	3380	38.55	82.71			211. (2)	79. (3)			
270	3380	38.55	82.71			108. (1)	66. (2)			
272	3440	40.07	82.46	5. (1)		107. (1)				
273	3580	40.36	83.76			128. (1)	73. (2)			
274	3640	41.47	82.19	45. (1)						
275	3640	41.47	82.19	842. (4)	83. (3)					
276	3640	41.47	82.19			129. (1)				
277	3640	41.47	82.16	30. (1)						
278	3640	41.43	82.11			129. (1)				
279	3640	41.46	82.18			165. (1)	84. (3)			
280	3640	41.46	82.19			108. (1)				
281	3640	41.47	82.16			150. (1)	83. (3)			
283	3640	41.44	82.11	53. (1)		133. (1)	75. (2)			
284	3720	41.52	83.80			150. (1)	64. (2)			
285	3720	41.71	83.61			115. (1)	54. (1)			
286	3720	41.71	83.61	52. (1)	17. (1)					
289	3720	41.72	83.48			133. (1)	59. (2)			
290	3720	41.71	83.61					47. (1)		

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
291	3720	41.66	83.53	100. (1)	31. (1)					
292	3720	41.65	83.53			212. (2)	69. (2)			
293	3720	41.65	83.53	277. (2)	42. (1)			51. (1)		206. (4)
294	3720	41.56	83.65			157. (1)	66. (2)			
296	3720	41.65	83.53	111. (1)					8. (2)	
298	3720	41.68	83.48			156. (1)	75. (2)			
300	3720	41.66	83.54	46. (1)		135. (1)		51. (1)		
303	3720	41.72	83.70			98. (1)	46. (1)			
304	3720	41.67	83.63			148. (1)	50. (1)			
305	3720	41.65	83.42			138. (1)	53. (1)			
307	3720	41.64	83.61			134. (1)	70. (2)			
308	3720	41.63	83.56			136. (1)	69. (2)			
309	3720	41.66	83.56			152. (1)	63. (2)			
311	3720	41.72	83.48							265. (4)
312	3720	41.72	83.48	131. (1)	30. (1)			44. (1)		
313	3720	41.66	83.57						14. (4)	
314	3720	41.64	83.52			157. (1)	74. (2)			
315	3720	41.66	83.53	289. (2)	54. (1)				6. (1)	
316	3720	41.66	83.53					59. (1)		
317	3720	41.69	83.44	351. (2)						
318	3800	39.89	83.42			129. (1)				
319	3800	39.89	83.42			149. (1)				
320	3800	39.89	83.43			174. (1)				
321	3800	39.89	83.43			115. (1)				
322	3820	41.12	80.67			328. (4)				
323	3820	41.12	80.67					71. (1)		
324	3820	41.10	80.65	378. (3)	78. (2)					421. (4)
325	3820	41.06	80.59			245. (2)	96. (4)			
327	3820	41.12	80.67			279. (3)	129. (4)			
330	3820	41.10	80.65			139. (1)	81. (3)			
332	3820	41.10	80.65	82. (1)	32. (1)			52. (1)		
333	3820	41.08	80.67	73. (1)	40. (1)	126. (1)	69. (2)	58. (1)		
334	3820	41.10	80.66			362. (4)	120. (4)			
336	3820	41.11	80.65			295. (3)	102. (4)			
337	3820	41.11	80.65			249. (2)	105. (4)			
338	3820	41.06	80.62			150. (1)	83. (3)			
339	3820	41.12	80.67	170. (1)	68. (2)					
341	3820	41.07	80.59			314. (3)	111. (4)			
343	3820	41.07	80.59	234. (1)	84. (3)			72. (1)		
344	3960	40.58	83.13			132. (1)				
346	4160	41.15	81.90							372. (4)
347	4160	41.14	81.86	114. (1)	22. (1)	111. (1)	61. (2)	39. (1)		
348	4160	41.03	81.73	166. (1)		147. (1)	78. (3)			
350	4130	38.97	81.91	63. (1)		226. (2)	80. (3)			
352	4260	39.96	84.17			106. (1)	58. (2)			

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
353	4260	40.14	84.24	36. (1)	10. (1)			21. (1)		
355	4260	40.14	84.24			183. (1)	68. (2)			
357	4260	40.14	84.23	36. (1)						196. (3)
358	4260	39.96	84.33			93. (1)	52. (1)			
359	4260	40.04	84.20	40. (1)	10. (1)	118. (1)	63. (2)	22. (1)		
360	4460	39.76	81.11			118. (1)	47. (1)			
361	4460	39.77	80.87	224. (1)	95. (3)	449. (4)	132. (4)			
363	4460	39.67	80.87			195. (1)	57. (2)			
364	4460	39.77	80.87					27. (1)		
367	4500	39.80	84.35			102. (1)				
368	4500	39.79	84.13	114. (1)						
369	4500	39.71	84.21	68. (1)	19. (1)	286. (3)	100. (4)	29. (1)		
372	4500	39.65	84.28	62. (1)	16. (1)	298. (3)	89. (3)	23. (1)		250. (4)
374	4500	39.76	84.19	110. (1)		140. (1)	86. (3)			
376	4500	39.74	84.39			102. (1)	47. (1)			
377	4500	39.72	84.18			106. (1)	52. (1)			
378	4500	39.63	84.37			106. (1)	48. (1)			
379	4500	39.86	84.16			121. (1)				
380	4500	39.75	84.19						23. (4)	
381	4500	39.76	84.20	181. (1)					14. (4)	137. (2)
382	4500	39.70	84.31			171. (1)	70. (2)			
383	4500	39.75	84.13						23. (4)	
384	4500	39.81	84.19	134. (1)		119. (1)	61. (2)			225. (4)
386	4500	39.75	84.24	74. (1)	15. (1)	177. (1)	71. (2)	23. (1)		
388	4500	39.77	84.18	163. (1)	31. (1)	154. (1)	78. (3)	58. (1)		
390	4500	39.76	84.19			256. (2)	94. (4)			
392	4500	39.80	84.30			95. (1)	49. (1)			
393	4500	39.87	84.14							118. (1)
394	4500	39.90	84.21			143. (1)	56. (1)			
395	4500	39.83	84.42			110. (1)	58. (2)			
396	4500	39.63	84.17			100. (1)	51. (1)			
398	4640	39.96	81.99			155. (1)	66. (2)			
399	4640	39.86	81.91			183. (1)	71. (2)			
400	4640	39.84	81.87	57. (1)						
402	5530	41.22	81.32	109. (1)						357. (4)
403	5530	41.16	81.24	96. (1)	31. (1)	132. (1)	67. (2)	38. (1)		
405	5530	41.15	81.34	92. (1)		128. (1)	55. (1)			
406	5640	39.74	84.63	64. (1)	23. (1)	114. (1)	47. (1)	20. (1)		
408	5740	40.88	82.66			115. (1)	56. (1)			
411	5740	40.80	82.51			141. (1)	63. (2)			
413	5740	40.76	82.50	65. (1)						
414	5740	40.77	82.51			231. (2)	74. (2)			
416	5740	40.80	82.51	52. (1)						
417	5740	40.77	82.49	42. (1)		131. (1)				

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
418	5740	40.77	82.51	45. (1)	16. (1)	196. (2)		43. (1)		
419	5840	39.47	82.91			101. (1)	48. (1)			
420 *	5840	67.21	90.17	124. (1)						
421 *	5840	67.21	90.17	173. (1)						
422	5840	39.34	82.99			197. (2)	67. (2)			
424	5840	39.37	82.98	48. (1)						
425	5840	39.29	82.95	48. (1)						
426 *	5840	67.21	90.17			154. (1)	63. (2)			
427	5840	39.33	83.00	54. (1)						
428	5840	39.37	82.98	148. (1)	21. (1)	104. (1)	51. (1)			
429	5980	41.31	83.28			125. (1)	46. (1)			
430	5980	41.40	83.32			588. (4)				
431	5980	41.39	83.32			234. (2)				
432	5980	41.32	83.27			329. (4)	66. (2)			
433	5980	41.45	83.37			175. (1)				
434	6020	38.87	82.73			120. (1)	56. (1)			
435	6020	38.73	83.18			120. (1)	38. (1)			
436	6020	38.82	82.73			149. (1)	72. (2)			
437	6020	38.75	82.97			95. (1)	48. (1)			
438	6020	38.75	82.92	21. (1)	6. (1)					
439	6020	38.73	83.00	132. (1)	6. (1)					
440	6020	38.73	83.00			229. (2)	90. (3)			
441	6020	38.76	82.89			127. (1)	61. (2)			
442	6020	38.73	82.97			269. (2)	73. (2)			
443	6020	38.73	83.00			110. (1)				
444	6020	38.73	83.00			139. (1)	68. (2)			
447	6020	38.75	82.94	37. (1)	12. (1)	137. (1)	63. (2)			
448	6220	40.28	84.15			107. (1)	63. (2)			
449	6220	40.30	84.16			118. (1)	55. (1)			
450	6400	40.87	81.33							245. (4)
451	6400	40.79	81.39	131. (1)	23. (1)	225. (2)	95. (4)	35. (1)		
452	6400	40.82	81.34			129. (1)				
453	6400	40.82	81.34			78. (1)				
454	6400	40.84	81.37	115. (1)	15. (1)	103. (1)	52. (1)	35. (1)		
455	6400	40.80	81.35			132. (1)	68. (2)			
456	6400	40.79	81.36			130. (1)	64. (2)			
457	6400	40.79	81.41			115. (1)	65. (2)			
459	6400	40.83	81.32	136. (1)	27. (1)	165. (1)	74. (2)	33. (1)		
461	6400	40.80	81.38			135. (1)	75. (2)		3. (1)	
464	6400	40.81	81.38			127. (1)	65. (2)			
465	6400	40.80	81.38	57. (1)	26. (1)	128. (1)		41. (1)		
466	6400	40.80	81.33			227. (2)	83. (3)			
467	6400	40.80	81.38	128. (1)	26. (1)			39. (1)		20. (1)
468	6400	40.74	81.46	100. (1)	21. (1)	85. (1)	43. (1)	22. (1)		

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
470	6400	40.85	81.28			127. (1)	60. (2)			
471	6400	40.67	81.35			101. (1)	55. (1)			
472	6400	40.95	81.24			146. (1)	63. (2)			
473	6400	40.66	81.63			96. (1)	59. (2)			
474	6400	40.85	81.28	105. (1)	14. (1)			25. (1)		
475	6400	40.92	81.09	136. (1)	29. (1)	154. (1)	76. (3)	43. (1)		
476	6400	40.79	81.52	118. (1)	26. (1)	116. (1)	63. (2)	37. (1)		
477	6500	41.10	81.44	120. (1)		144. (1)	78. (3)			
430	6500	41.24	81.56			143. (1)	55. (1)			
431	6500	40.95	81.47	122. (1)		166. (1)	57. (2)			
482	6500	41.24	81.56	66. (1)						
483	6500	41.17	81.45	117. (1)		134. (1)	64. (2)			
484	6500	41.08	81.52	125. (1)	60. (1)	123. (1)	78. (3)	49. (1)		
485	6500	41.08	81.52			181. (1)	82. (3)			
486	6500	41.08	81.52	157. (1)	57. (1)	175. (1)	89. (3)	53. (1)		
489	6500	41.07	81.52							103. (1)
490	6500	41.06	81.47	158. (1)	40. (1)	146. (1)	75. (2)	50. (1)		
492	6500	41.10	81.50	174. (1)	56. (1)	122. (1)	70. (2)	55. (1)		
493	6500	41.12	81.57	118. (1)		117. (1)	65. (2)			
495	6500	41.31	81.44	72. (1)		137. (1)	68. (2)			
497	6500	41.04	81.56	204. (1)	49. (1)	131. (1)	69. (2)	47. (1)		
500	6500	41.02	81.61			137. (1)	77. (3)			
502	6500	41.02	81.61	183. (1)	48. (1)			48. (1)		
503	6700	41.23	80.82					65. (1)		
504	6700	41.23	80.82			209. (2)	83. (3)			
505	6700	41.23	80.82	100. (1)	54. (1)	171. (1)	84. (3)			
506	6700	41.25	80.85			141. (1)	73. (2)			
507	6700	41.25	80.80					50. (1)		
508	6700	41.26	80.67			119. (1)	61. (2)			
509	6700	41.15	80.70			182. (1)	79. (3)			
510	6700	41.17	80.74			195. (1)	74. (2)			
512	6700	41.25	80.80	98. (1)	34. (1)	130. (1)	64. (2)			
513	6720	40.52	81.48	218. (1)		133. (1)	66. (2)			
514	6720	40.51	81.64			152. (1)				
515	6730	40.18	83.29			122. (1)	49. (1)			
516	6780	40.18	83.30			120. (1)	40. (1)			
517	6780	40.20	83.28			114. (1)	40. (1)			
518	7040	39.46	84.20			109. (1)	46. (1)			
520	7040	39.43	84.20	39. (1)	8. (1)			37. (1)		104. (1)
521	7040	39.55	84.31	82. (1)	26. (1)	112. (1)		47. (1)		
522	7040	39.35	84.14			96. (1)	43. (1)			
526	7100	39.27	81.59			194. (1)	62. (2)			
528	7100	39.41	81.45			156. (1)	69. (2)			
530	7160	40.98	81.79	268. (1)	45. (1)	110. (1)				

Table V.13. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
531	7160	40.97	81.78	194. (1)	37. (1)	167. (1)	63. (2)			
532	7160	40.97	81.77	285. (2)	45. (1)	109. (1)				
533	7160	40.98	81.75	140. (1)	19. (1)	146. (1)	56. (1)			
534	7160	40.95	81.78	125. (1)	27. (1)	168. (1)	52. (1)			
535	7160	40.84	81.79			109. (1)	54. (1)			
536	7160	40.78	81.92			143. (1)	55. (1)			
537	7160	40.80	81.94			122. (1)	61. (2)			
538	7580	41.38	83.64	47. (1)		178. (1)				
540	7580	41.61	83.56			112. (1)	54. (1)			
542	7580	41.56	83.63			185. (1)				
543	7630	40.96	83.38			219. (2)				

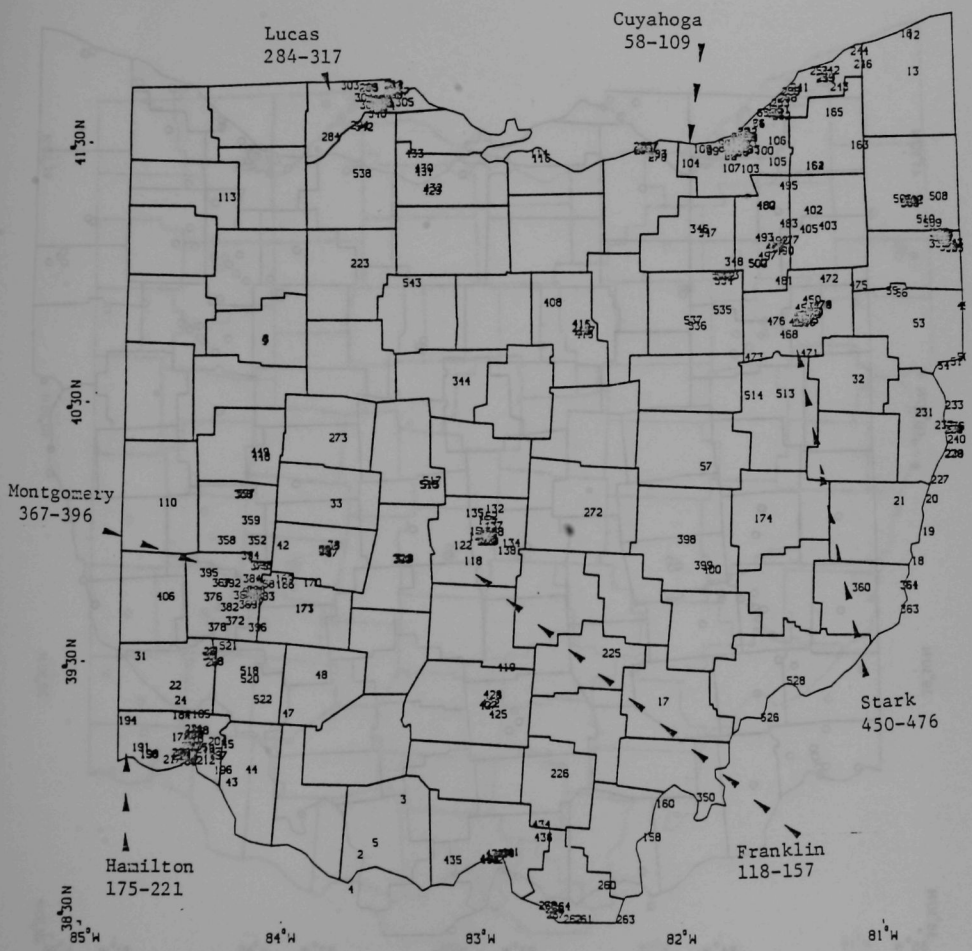


Fig. V.64. Ohio: Locations of SAROAD Monitors
(See Table V.13 for Monitor Numbers)

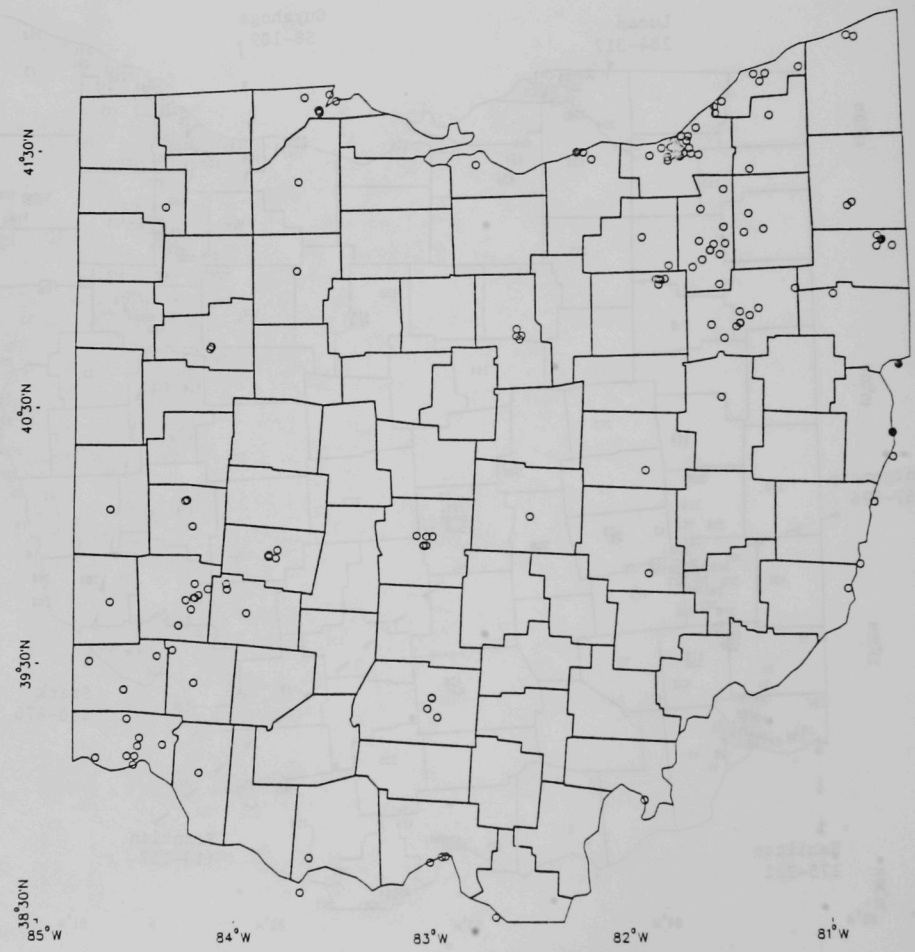


Fig. V.65. Ohio: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

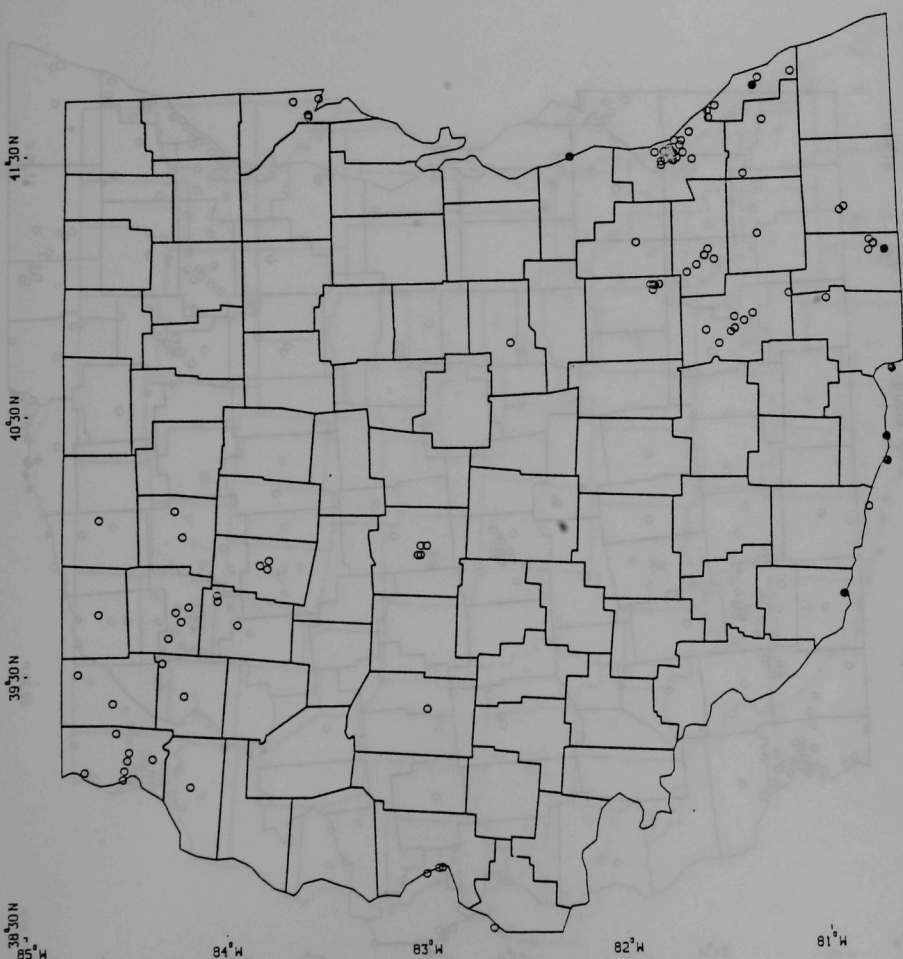


Fig. V.66. Ohio: Monitors Reporting Adequate Data on Annual Average SO_2; Violations Shown by Shaded Circles

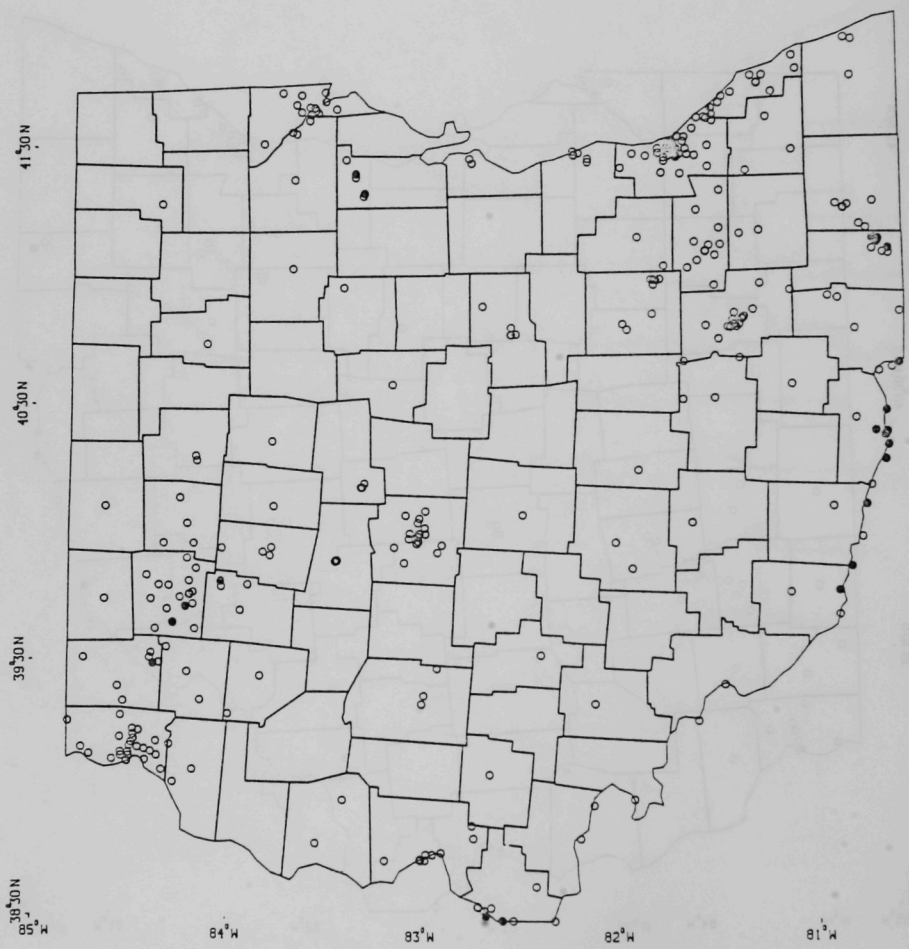


Fig. V.67. Ohio: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

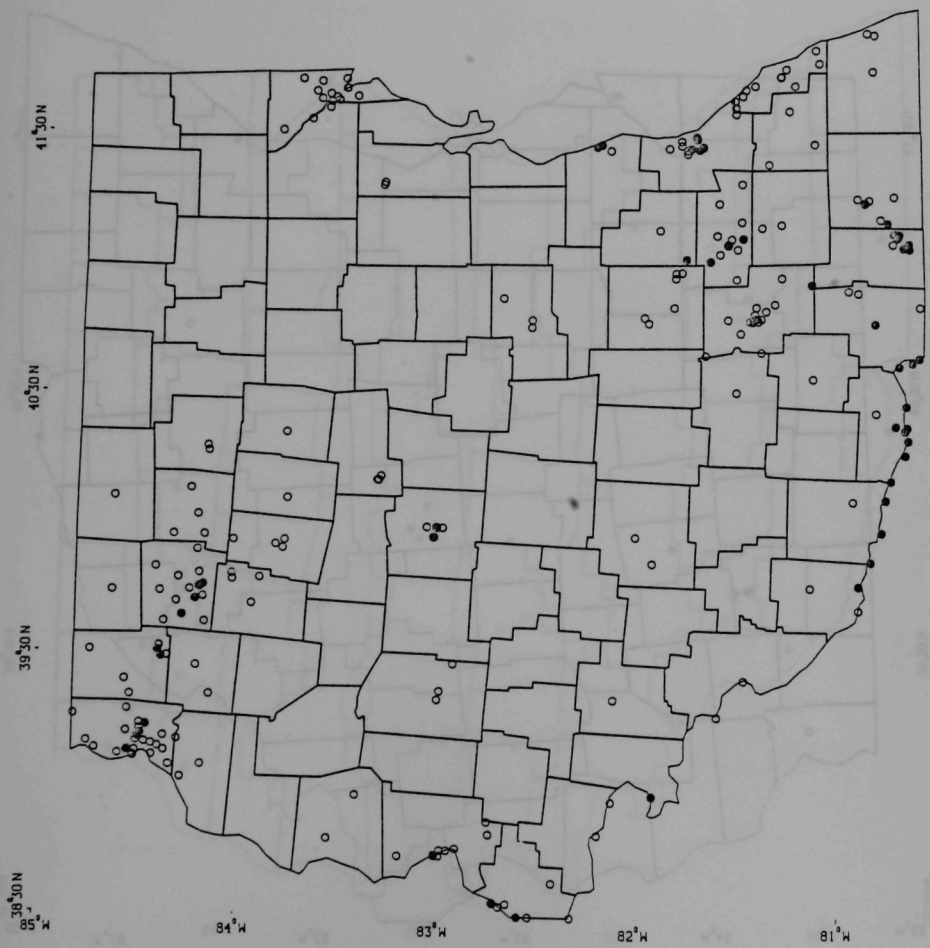


Fig. V.68. Ohio: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

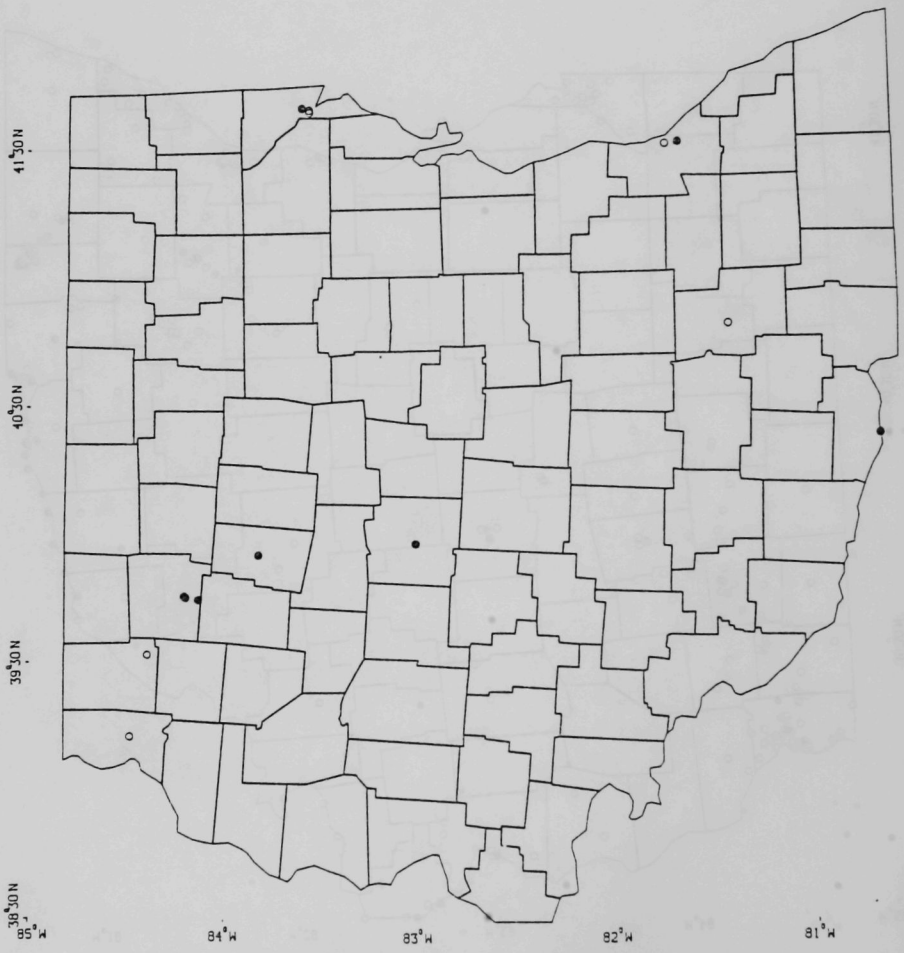


Fig. V.69. Ohio: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

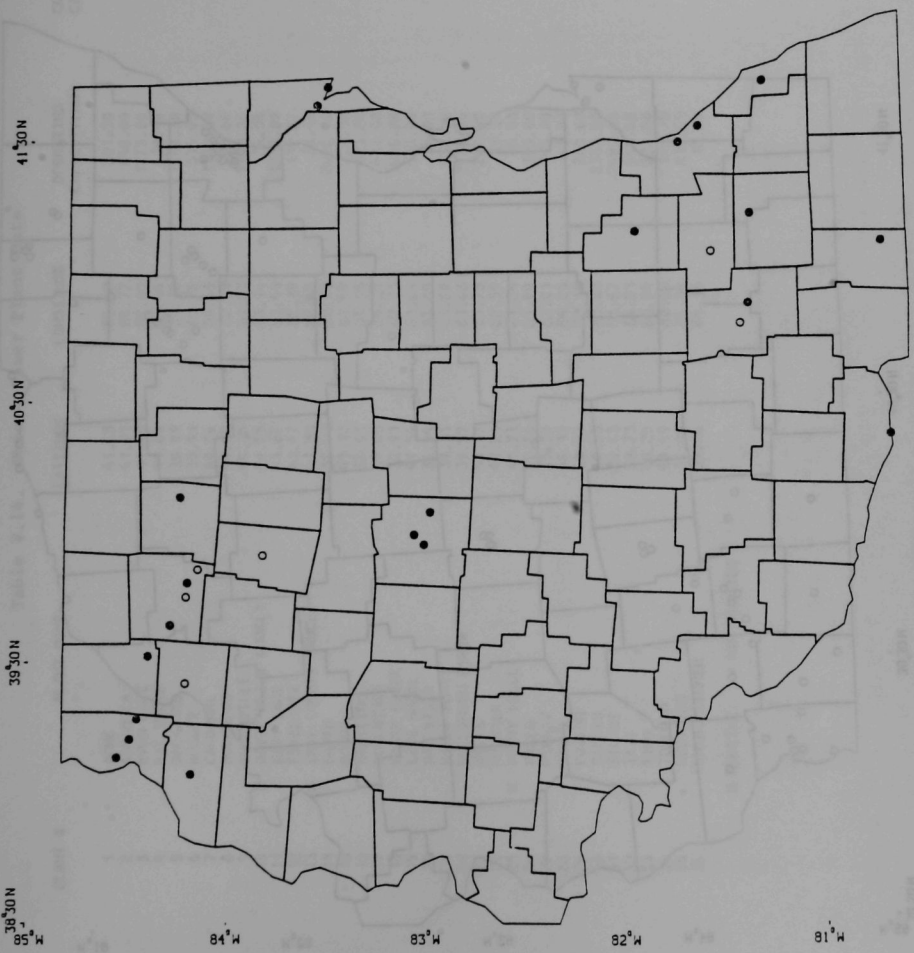


Fig. V.70. Ohio: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

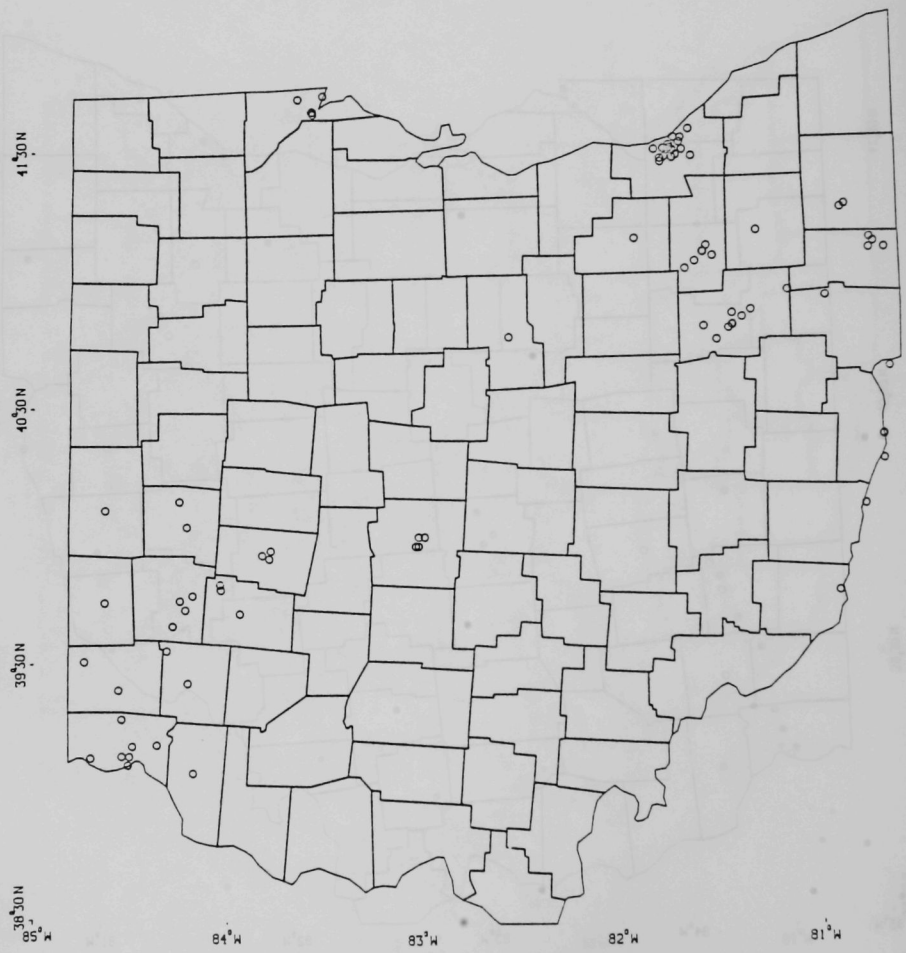


Fig. V.71. Ohio: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table V.14. Ohio: Power Plant Data

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		ACME	41.65	83.52	301.50	0.0
2		ASHABULA	41.91	80.77	640.00	0.0
3		AVON LAKE	41.50	82.05	1275.00	0.0
4		BAY SHORE	41.69	83.44	639.40	0.0
5		BECKJORD	38.99	84.30	1221.30	0.0
6		BURGER	39.91	80.76	544.00	0.0
7		CARDINAL	40.26	80.64	1130.00	0.0
8		COLUMBUS	40.00	82.99	52.60	0.0
9		CONESVILLE	40.18	81.83	1162.00	0.0
10	N	DAVIS-BESSE (NUCL)	41.55	83.14	36.50	0.0
11		EAST LAKE	41.67	81.44	1257.00	0.0
12		EDGEWATER	41.47	82.19	192.87	0.0
13	N	ERIE COUNTY (NUCL)	41.38	82.63	30.40	0.0
14		GAVIN	38.91	82.13	2600.00	0.0
15		GORGE	41.12	81.49	87.50	0.0
16		HAMILTON	39.41	84.55	123.00	0.0
17		HUTCHINGS	39.65	84.23	414.00	0.0
18		KYGER CREEK	38.91	82.13	1036.00	0.0
19		LAKE SHORE	41.54	81.64	518.00	0.0
20		MAD RIVER	39.94	83.85	75.00	0.0
21		MIAMI FORT	39.11	84.80	950.30	0.0
22		MUSKINGUM RIVER	39.59	81.63	1466.80	0.0
23		NILES	41.17	80.75	250.00	0.0
24		NORWALK	41.24	82.59	31.33	0.0
25	N	PERRY (NUCL)	41.71	81.24	35.40	0.0
26		PHILO	39.86	81.90	395.00	0.0
27		PICKWAY	39.79	83.01	145.00	0.0
28		PIQUA	40.12	84.24	63.00	0.0
29		POSTON	39.37	82.18	200.00	0.0
30		SAMMIS	40.53	80.63	2303.50	0.0
31		STUART	38.63	83.67	2400.00	0.0
32		TAIT	39.73	84.21	448.60	0.0
33		TIDD	40.25	80.64	222.20	0.0
34		TORONTO	40.49	80.60	175.75	0.0
35		WEST END	39.09	84.52	219.25	0.0
36		WM.H. ZIMMER	39.06	84.15	12.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.15. Ohio: Fuel Use Data

PLANT #		PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1		ACME	2.54	393.00	1.39	94.00	1534.00
2		ASHTABULA	3.26	1172.40	1.65	359.43	0.0
3		AVON LAKE	3.13	2432.30	1.72	196.22	0.0
4		BAY SHORE	2.12	1366.00	0.57	17.00	0.0
5		BECKJORD	2.63	2333.70	0.50	23.50	0.0
6		BURGER	2.93	1501.90	0.0	0.0	0.0
7		CARDINAL	2.62	2123.30	0.10	74.00	0.0
8		COLUMBUS	2.79	31.22	0.24	13.04	511.63
9		CONESVILLE	4.43	2699.00	0.0	0.0	0.0
10	N	DAVIS-BESSE (NUCL)	0.0	0.0	0.0	0.0	0.0
11		EAST LAKE	3.45	3156.70	0.10	13.27	0.0
12		EDGEWATER	2.79	426.20	0.0	0.0	0.0
13	N	ERIE COUNTY (NUCL)	0.0	0.0	0.0	0.0	0.0
14		GAVIN	2.50	5766.70	0.10	142.70	0.0
15		GORGE	3.41	259.00	0.0	0.0	0.0
16		HAMILTON	0.83	111.63	0.15	65.56	525.10
17		HUTCHINGS	0.90	552.50	0.0	0.0	93.90
18		KYGER CREEK	4.12	3231.00	0.0	0.0	0.0
19		LAKE SHORE	2.23	1029.30	0.10	11.57	0.0
20		MAD RIVER	1.45	140.20	0.0	0.0	0.0
21		MIAMI FORT	2.66	1513.10	0.50	212.80	0.0
22		MUSKINGUM RIVER	4.52	3307.20	0.23	35.93	0.0
23		NILES	3.12	640.60	0.0	0.0	0.0
24		NORWALK	3.39	15.60	0.30	1.50	0.0
25	N	PERRY (NUCL)	0.0	0.0	0.0	0.0	0.0
26		PHILO	3.11	166.00	0.0	0.0	0.0
27		PICWAY	3.54	254.00	0.0	0.0	0.0
28		PIQUA	3.47	129.15	0.25	11.50	0.0
29		POSTON	3.43	604.00	0.0	0.0	0.0
30		SAMMIS	2.74	4817.90	0.0	0.0	0.0
31		STUART	1.89	5046.90	0.50	24.20	0.0
32		TAIT	1.04	500.90	0.20	73.50	41.50
33		TIDD	2.64	400.80	0.10	25.90	0.0
34		TORONTO	2.63	350.40	0.0	0.0	0.0
35		WEST END	0.0	0.0	0.0	0.0	1933.10
36		W.H. ZIMMER	0.0	0.0	0.0	0.0	0.0

N NUCLEAR * NOT PLOTTED

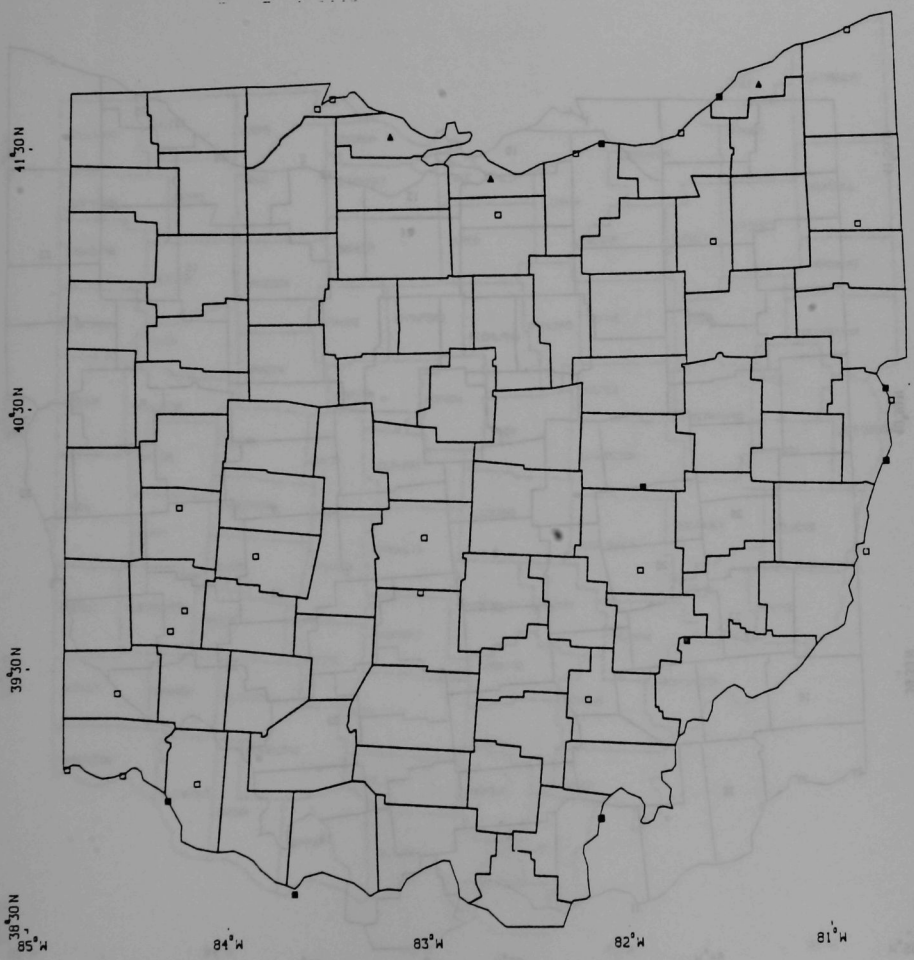


Fig. V.72. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

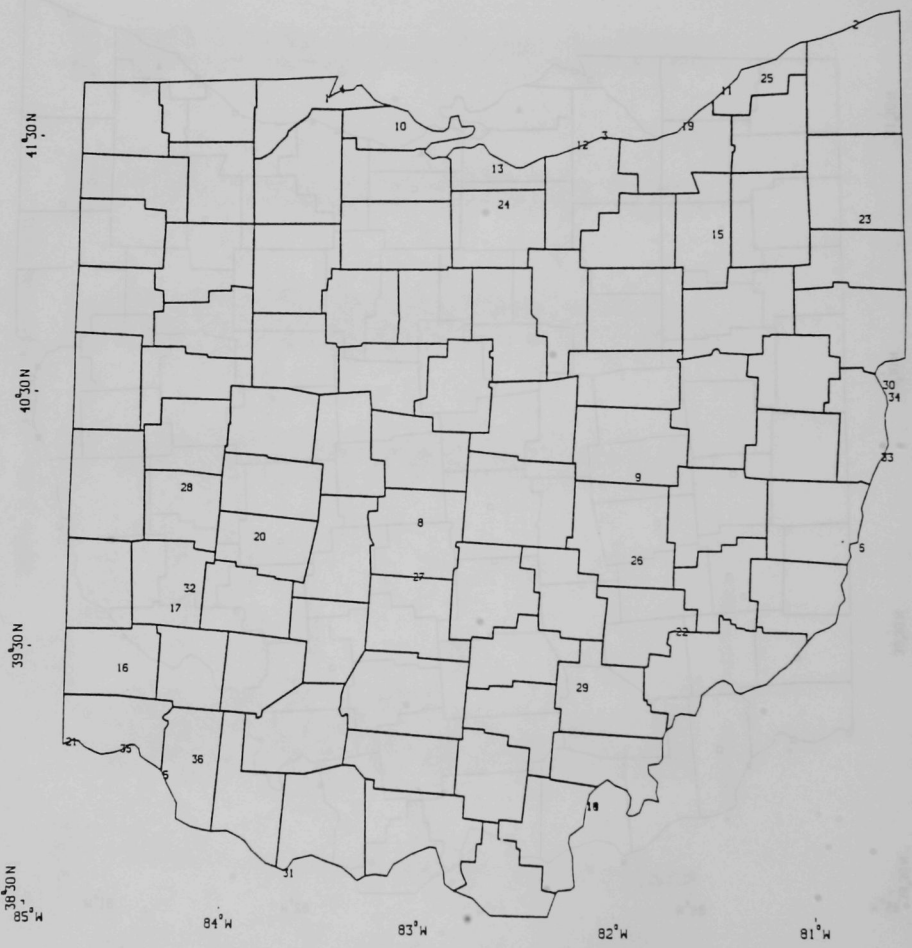


Fig. V.73. Power Plant Key (See Tables V.14 and V.15 for Identification and Fuel Use Data)

Fig. V.74. Ohio: Key to Counties

REGION V: WISCONSIN

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a] Primary	Secondary	No. of Monitors	No. of Monitors Recording Primary Violations
SO_2	24 hr	2	0	22	0
	1 yr			7	0
TSP	24 hr	4	14	42	1
	1 yr			19	1
NO_x	1 yr	0[b]	-	2	0
CO	8 hr	1	-	7	0
O_x	1 hr	7	-	9	5

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	25
Nuclear	3
Total	28

WISCONSIN (Official SIP, 6/79)

I. SOURCES OF THE PROBLEM

Wisconsin has two SO_2 nonattainment areas. In Madison, (Dane Co.) the short-term primary and secondary standards are being violated, primarily due to the Madison Gas and Electric Company-Blount St. generating station and an Oscar Meyer and Co. plant. In Brokaw (Marathon Co.), the primary source is Wasau Paper Mills, Inc.

Wisconsin has 15 TSP nonattainment areas, 11 for the secondary standards and four recording primary violations. The actual size of the areas involved, however, is quite small. In designating these areas, Wisconsin discounted any violations that might have been caused solely by rural fugitive dust, construction, or control malfunctions. The primary areas are Beloit (Rock Co.), Milwaukee (Milwaukee Co.), Waukesha (Waukesha Co.) and Columbia (Pacific Co.).

In Beloit, the Beloit Corporation-St. Lawrence Plant, is the primary point source of particulates, with contributions from resuspended road dust and open burning. Wind erosion and nonindustrial fugitive emissions are thought to be significant contributors, but the amount attributable to them is not yet known. The Southeast Wisconsin Instrastate Air Quality Region (SEWIAQCR) contains a number of TSP nonattainment areas. Milwaukee and Waukesha have both primary and secondary areas; Racine and Kenosha have only secondary areas. In Milwaukee, Waukesha, and Racine, the primary cause is fugitive dust from industrial facilities, paved and unpaved roads and parking lots, and materials storage piles. It is not yet known what causes the problem in Kenosha. It is known that stack-related point sources contribute less than 5% to recorded levels of TSP in the region. Fugitive quarry dust is possibly a significant cause at various localities. The major point sources in Pacific Township are Wisconsin Power and Light, and Martin Marietta Sand Plant.

In Wisconsin, ten counties are in nonattainment for ozone and another 56 remain unclassified due to lack of data. Only Wisconsin, Dane, and Milwaukee Counties are urban areas with populations greater than 200,000, although Brown County comes close. Both mobile and stationary VOC sources are significant.

An area within the City of Milwaukee is the only area in nonattainment for CO, with violations a result of motor vehicle emissions.

II. ATTAINMENT STRATEGIES

A. SO_2

1. Madison

a. Resite and add to monitors in order to determine SO_2 concentrations more accurately

b. State regulation limiting sulfur in fuel in AQCR to 1.11 lb sulfur/MM Btu

2. Brokaw

a. Oil-burning combustion units to be limited to 0.4 lb/MM Btu in fuel

b. Control efficiencies set for acid plants and digester

B. TSP

1. Beloit

a. RACT on stack and industrial fugitive emissions (especially Colt Industries, Beloit Corporation, and Wisconsin Power and Light Co.)

b. Emission offset requirement in or near the nonattainment area

c. Prohibit open burning

d. Secondary attainment requires further study of area sources and nontraditional controls such as paving, street cleaning, and revegetation of exposed soils

2. SEWIAQCR (Milwaukee, Waukesha, Racine, and Kenosha)

a. RACT on stack and industrial fugitive emissions sources

b. Offsets for new or modified sources constructed in or near the nonattainment areas

c. Conduct studies on industrial process fugitive emissions, area sources (especially reentrained road dust), quarry fugitive emissions, the feasibility of control of nontraditional control measures such as street cleaning and revegetation

d. Primary attainment will not be achieved in Milwaukee by 1982 despite these measures, and modeling does not provide enough data to show attainment in Waukesha, Racine, or Kenosha

3. Wisconsin has asked for an extension to March 1980 for submitting a plan for secondary TSP atainment. On July 6, EPA proposed approval.

C. O_x

1. Federal Motor Vehicle Emissions Control Program will provide reductions in all counties
2. RACT on 15 source categories of stationary VOC for all nonattainment counties, and 8 other counties
3. RACT on additional source categories in 4 counties
4. RACT on 15 source categories for all major sources in the remaining counties
5. Inspection and maintenance program for motor vehicles in southeastern Wisconsin to be implemented by 1983
6. Some transportation control measures in southeastern Wisconsin
7. The state requests delay of the attainment deadline until 1987 for southeastern Wisconsin
8. Southeastern Wisconsin may require further transportation control or SIP revision to reach attainment by 1987
9. On July 10, EPA proposed conditional approval of Wisconsin VOC regulations with only minor objections

D. CO

1. FMVECP
2. Inspection and maintenance program for motor vehicles for southeastern Wisconsin
3. The state requests a delay of the deadline until 1987

III. NEW SOURCE REVIEW

Present procedures include permits for all sources, offsets in nonattainment areas, and a showing of no contribution to air standards violation. Review procedures to be adopted in the Fall of 1979 will use a standard EPA emission offset policy with the following variations: (1) offset of 20% more than actual emissions in primary nonattainment areas and 10% in secondary areas (1.2:1, 1.1:1), (2) demonstration through dispersion modeling of a significant improvement in area air quality, and (3) new or modified sources with allowable hydrocarbon emissions of 50 tons per year or more must achieve offsets in accordance with a table broken down by county, specifying percentage offset, with increases for distance between source and offset.

Hydrocarbon offsets in southeastern Wisconsin can come from outside the source's county in the southeastern Wisconsin AQCR. Banking of offsets only occurs in a phased development program and is for internal use only.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. No general limit on existing sources
2. New sources
   a. With heat input > 250 MM Btu/hr: NSPS
   b. With heat input < 250 MM Btu/hr: not to burn coal with a sulfur content > 1.11 lb/MM Btu

B. TSP

1. New Sources (built after 4/1/72)
   a. With heat input < 250 MM Btu/hr: 0.15 lb PM/MM Btu
   b. With heat input > 250 MM Btu/hr: 0.10 lb PM/MM Btu
2. Existing sources
   a. General state limit: 0.60 lb PM/MM Btu, regardless of stack height
      - emissions determined for individual source by ASME standard
   b. Lake Michigan Interstate AQCR, subregion 1
      - maximum emissions, determined by ASME standard, not to exceed 0.30 lb PM/MM Btu
   c. Southeast Wisconsin Interstate AQCR
      - Sources with heat input > 250 MM Btu/hr: 0.15 lb PM/MM Btu
      - Sources for which 1 < heat input < 250 MM Btu/hr: maximum emissions calculated by E = 0.3 -0.0006 (MM Btu/hr)
      - Sources with heat input < 1 MM Btu/hr: exempt
      - BACT to be used in any nonattainment area, even if such controls would not be needed to meet emission limitations

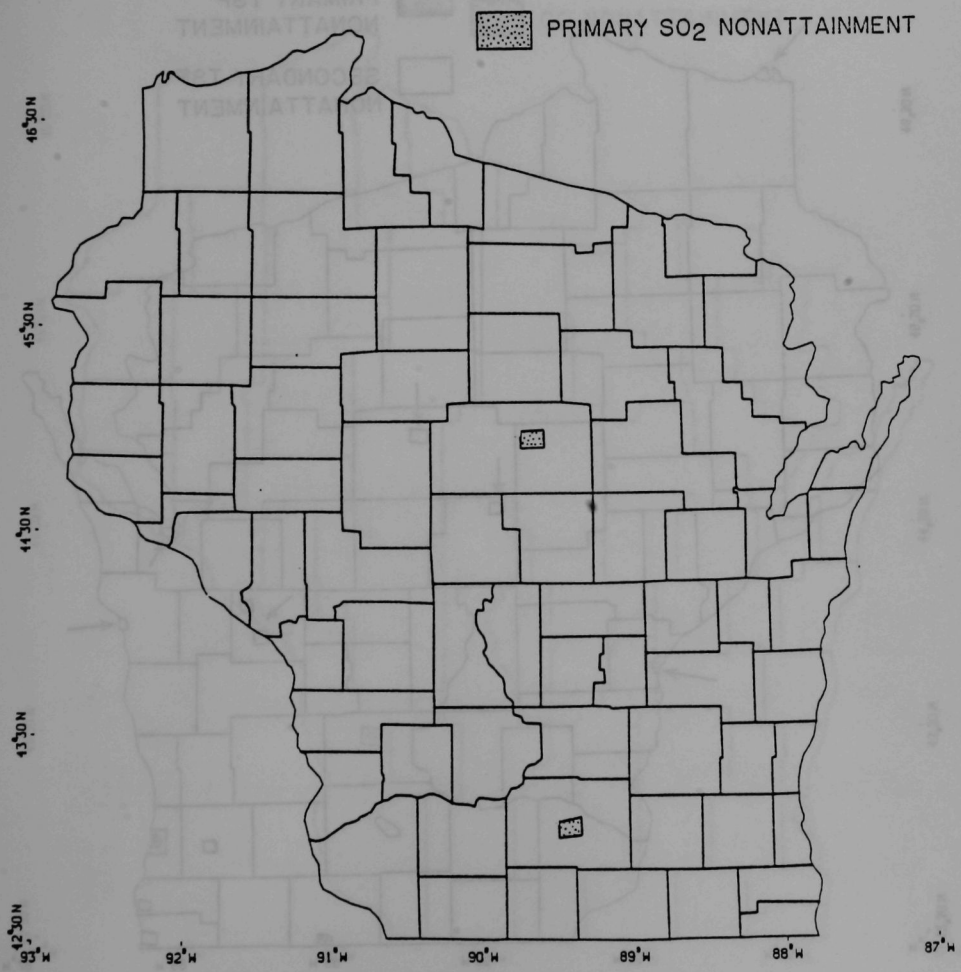


Fig. V.75. Wisconsin: SO_2 Nonattainment Areas as Designated May 1979

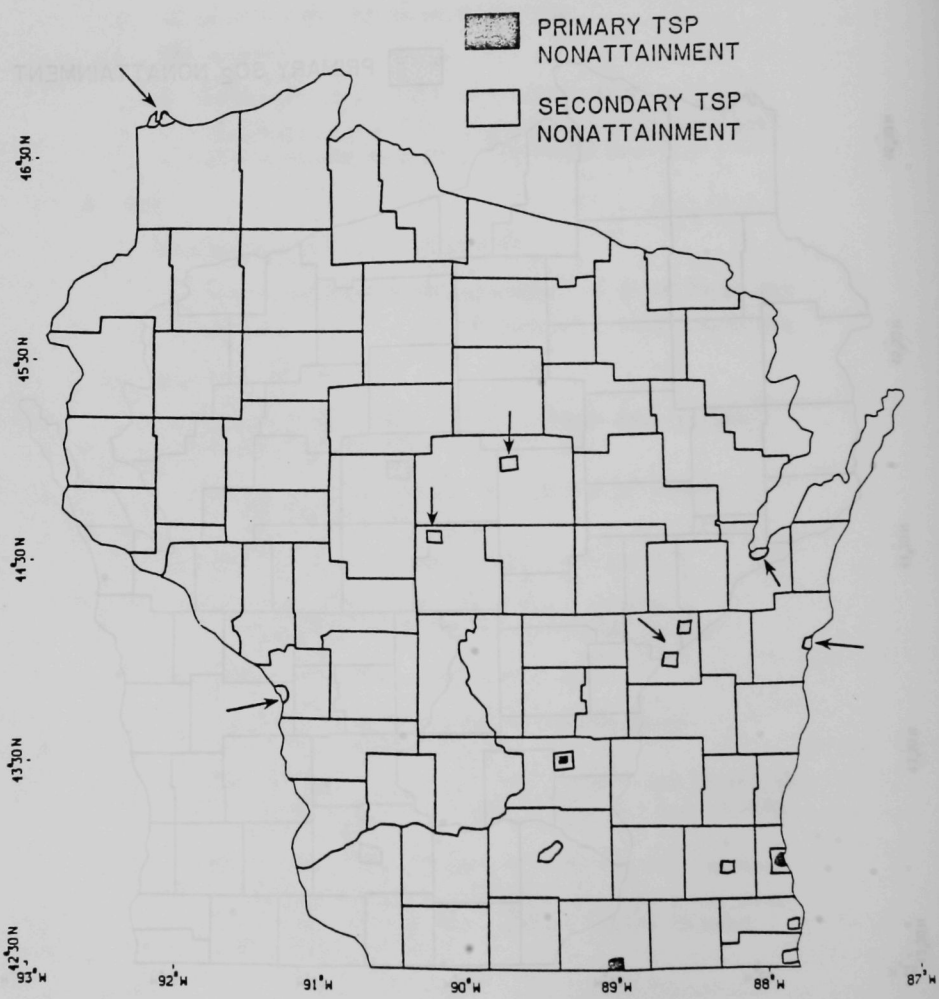


Fig. V.76. Wisconsin: TSP Nonattainment Areas as Designated May 1979

Fig. V.77. Wisconsin: CO Nonattainment Areas as Designated May 1979

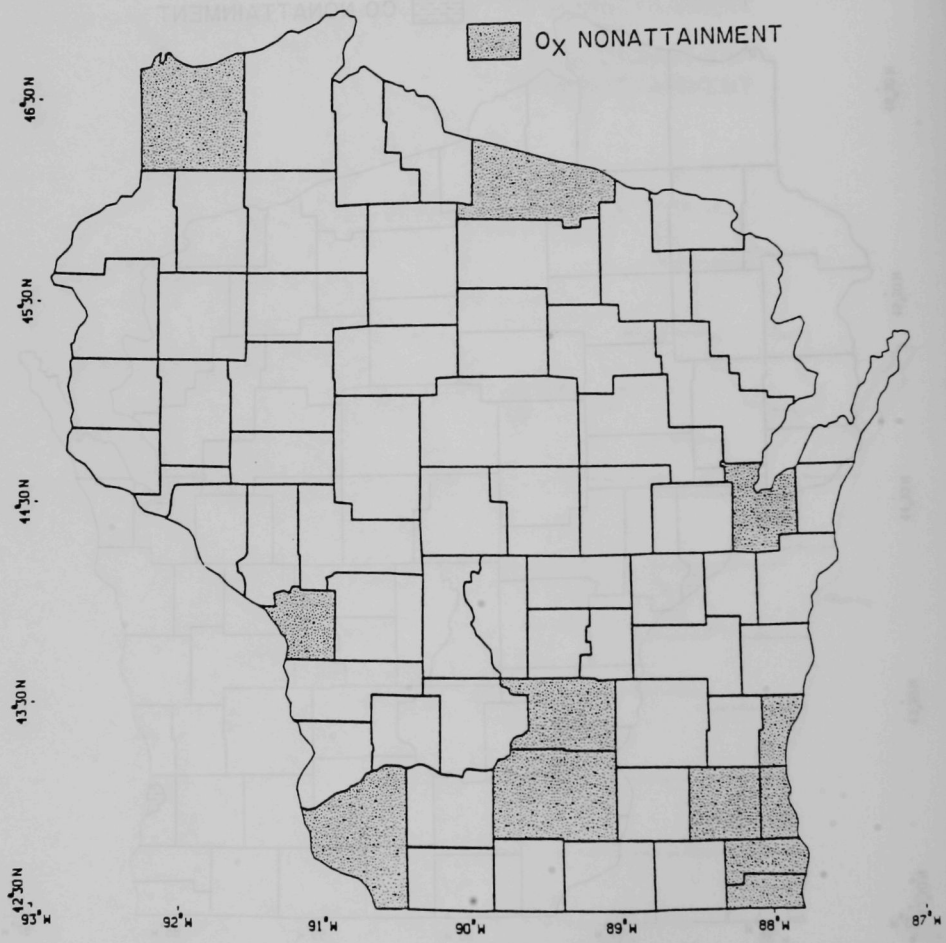


Fig. V.78. Wisconsin: O_X Nonattainment Areas as Designated May 1979

Table V.16. Wisconsin: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	120	46.58	90.91			106. (1)				
2	120	46.58	90.87	27. (1)		109. (1)	35. (1)			
4	360	44.52	88.00	223. (1)		121. (1)				
5	360	44.52	87.92	98. (1)		109. (1)	29. (1)			
6	360	44.51	88.01	257. (1)	32. (1)	136. (1)	54. (1)			
7	360	44.52	88.03	130. (1)	17. (1)	115. (1)	47. (1)			
8	360	44.45	88.07	31. (1)		81. (1)	40. (1)			
10 *	600	0.0	0.0			308. (3)				
11	600	43.38	89.40			71. (1)	30. (1)			
12	680	43.08	89.37	27. (1)	7. (1)	140. (1)	62. (2)			
13	680	43.11	89.36	173. (1)	22. (1)	165. (1)	62. (2)			
14	680	43.07	89.40	47. (1)	7. (1)	153. (1)	56. (1)			
15	680	43.12	89.36	238. (1)	32. (1)	161. (1)	56. (1)			
16	680	43.09	89.33	22. (1)	7. (1)	106. (1)	47. (1)			
17	680	43.07	89.38	27. (1)		105. (1)				
18	680	43.07	89.38			104. (1)				
19	680	43.07	89.38	120. (1)	15. (1)	147. (1)	64. (2)			
21	780	45.15	87.20			25. (1)				
23	780	45.15	87.20	16. (1)						
24 *	800	0.0	0.0	59. (1)		36. (1)			1. (1)	129. (2)
25 *	800	0.0	0.0	58. (1)		75. (1)			0. (1)	192. (3)
26	800	46.69	92.02			131. (1)	42. (1)			
28	800	46.72	92.10	23. (1)	5. (1)	161. (1)	62. (2)	31. (1)		
29	800	46.72	92.09			103. (1)	35. (1)			
30	800	46.69	92.03	15. (1)	4. (1)	169. (1)	46. (1)			
32	800	46.72	92.10			94. (1)				
35	860	44.80	91.49	34. (1)	7. (1)	81. (1)	30. (1)			
36	860	44.81	91.50			96. (1)	46. (1)			
38	860	44.82	91.48			101. (1)				
40	1000	43.78	88.45			74. (1)				
41	1000	43.79	88.43			75. (1)				
42	1000	43.78	88.45			95. (1)				
43	1000	43.85	88.84			76. (1)	35. (1)			
44	1140	42.74	90.48			106. (1)				
45 *	1140	0.0	0.0			58. (1)			0. (1)	
46 *	1140	0.0	0.0	3. (1)		108. (1)				
47	1140	42.58	90.60			65. (1)				
48 *	1140	0.0	0.0	26. (1)						184. (3)
49 *	1560	0.0	0.0			151. (1)				
50	1560	42.58	87.82			180. (1)				
51	1560	42.58	87.84			103. (1)				
52	1560	42.57	87.86			130. (1)				
53	1560	42.59	87.82	62. (1)	7. (1)	96. (1)				

Table V.16. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
54	1560	42.59	87.82			128. (1)				
56	1680	43.81	91.24	55. (1)	11. (1)	159. (1)	47. (1)			
57	1680	43.81	91.23	72. (1)	14. (1)	163. (1)	42. (1)			
59 *	1900	44.07	87.28			79. (1)				
60 *	1900	44.09	87.28			177. (1)				
61	1920	45.03	89.65	92. (1)		169. (1)	44. (1)			
62 *	1920	0.0	0.0			157. (1)				
63 *	1920	0.0	0.0	70. (1)		177. (1)				
64 *	1920	0.0	0.0	130. (1)		183. (1)				
65	1920	44.95	89.63	29. (1)	7. (1)	111. (1)	38. (1)			
66	1920	44.96	89.63	42. (1)	11. (1)	131. (1)	43. (1)			
67	1920	44.96	89.64	40. (1)	10. (1)	103. (1)	43. (1)			
68 *	1920	0.0	0.0	827. (4)						
69	2220	43.04	87.92			130. (1)	66. (2)			
72	2220	43.03	87.88			119. (1)	45. (1)			
73	2220	43.05	87.92			161. (1)				
74	2220	43.03	87.92			118. (1)				
75	2220	43.08	87.96			152. (1)	49. (1)			
76 *	2220	0.0	0.0			105. (1)				
77	2220	43.01	87.90			256. (2)				
78	2220	43.11	88.03			51. (1)				
79	2220	43.01	87.94			165. (1)	60. (2)			
80	2220	42.98	87.91			126. (1)				
81	2220	43.01	87.94			217. (2)				
82	2220	43.04	87.96			221. (2)	68. (2)			
83	2220	42.98	87.99			167. (1)	53. (1)			
84	2220	43.04	87.92	12. (1)	8. (1)			54. (1)		
85	2220	42.98	87.96	159. (1)					7. (1)	366. (4)
86	2220	43.07	87.88	287. (2)					9. (2)	332. (4)
87	2220	43.02	87.90	157. (1)					14. (4)	392. (4)
88	2220	43.04	87.92			247. (2)	71. (2)			
89 *	2220	0.0	0.0			281. (3)				
90 *	2220	0.0	0.0			139. (1)				
91	2220	43.04	87.92	151. (1)					8. (2)	319. (4)
92	2220	43.02	87.92			197. (2)				
93	2220	43.00	87.98			171. (1)				
94	2220	43.00	87.98			379. (4)				
95	2220	43.01	87.97			221. (2)				
96	2220	43.00	87.98			165. (1)				
97	2220	43.04	87.96	235. (1)	32. (1)				9. (2)	378. (4)
98	2220	43.09	88.01	231. (1)		96. (1)			9. (2)	386. (4)
100	2220	42.90	87.87			101. (1)				
101	2220	43.05	88.03	325. (2)		124. (1)			7. (1)	

Table V.16. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
102	2220	42.99	88.03			117. (1)				
103	2220	43.05	83.03							345. (4)
104	2220	42.88	88.00			146. (1)	50. (1)			
106 *	2540	0.0	0.0	195. (1)		55. (1)			1. (1)	129. (2)
107 *	2580	0.0	0.0	26. (1)		119. (1)			0. (1)	161. (3)
108	2580	44.26	88.41			105. (1)	49. (1)			
109	2600	43.32	87.91	70. (1)		118. (1)			2. (1)	376. (4)
110	2600	43.39	87.87			152. (1)	41. (1)			
111	2700	44.85	92.62	37. (1)	6. (1)	124. (1)	34. (1)			
112	2800	44.52	89.58	10. (1)	3. (1)	63. (1)	31. (1)			
113	2800	44.51	89.58	15. (1)	3. (1)	65. (1)	26. (1)			
114	2800	43.50	89.51	25. (1)						
115	2800	43.46	89.46	46. (1)						
116	2800	43.52	89.38	39. (1)						
117	2800	43.55	89.49	31. (1)						
119	2900	42.71	87.79			147. (1)	68. (2)			
120	2900	42.74	87.80			233. (2)	89. (3)			
121	2900	42.75	87.81			123. (1)				
122	2900	42.72	87.84			115. (1)	50. (1)			
123	2900	42.70	87.82			101. (1)	49. (1)			
124	2900	42.73	87.79			127. (1)	59. (2)			
125	2900	42.73	87.79	28. (1)	8. (1)					
127	2900	42.81	87.89			102. (1)	44. (1)			
128	2900	42.80	87.80			82. (1)				
129	2900	42.68	88.05			92. (1)	48. (1)			
130	2900	42.71	87.81	117. (1)	28. (1)				5. (1)	425. (4)
131	2900	42.71	87.79			80. (1)				
132	2900	42.68	88.28			113. (1)	57. (2)			
133 *	3060	0.0	0.0	102. (1)		126. (1)			4. (1)	118. (1)
134 *	3060	0.0	0.0	98. (1)		117. (1)				
135 *	3060	0.0	0.0	31. (1)		38. (1)				
136	3060	42.53	88.98			115. (1)				
137	3060	42.50	89.03			175. (1)	72. (2)			
139	3060	42.50	89.04			171. (1)	49. (1)			
140	3060	42.50	89.03	79. (1)	15. (1)					
141	3060	42.51	89.04			124. (1)				
142	3060	42.50	89.03			84. (1)				
143 *	3060	0.0	0.0	91. (1)		70. (1)			1. (1)	110. (1)
144	3540	46.05	89.65			40. (1)				
145	3640	46.16	89.80							157. (2)
146	3680	42.59	88.44			103. (1)	41. (1)			
147	3680	42.84	88.74	26. (1)		77. (1)				
148	3780	43.01	88.23	159. (1)					9. (2)	372. (4)
149	3780	43.01	88.24			110. (1)	55. (1)			
150	4020	44.02	88.54	10. (1)						

Table V.16. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
151	4020	44.18	83.46			89. (1)				
152	4020	44.02	83.54			122. (1)				
153	4020	44.03	83.55	51. (1)		87. (1)				
154	4020	44.20	83.45	51. (1)	7. (1)	133. (1)	50. (1)			
155	4060	44.66	90.16			280. (3)				
156	4060	44.66	90.16			236. (2)				
157 *	4060	0.0	0.0			57. (1)				
158	4060	44.67	90.20			44. (1)				

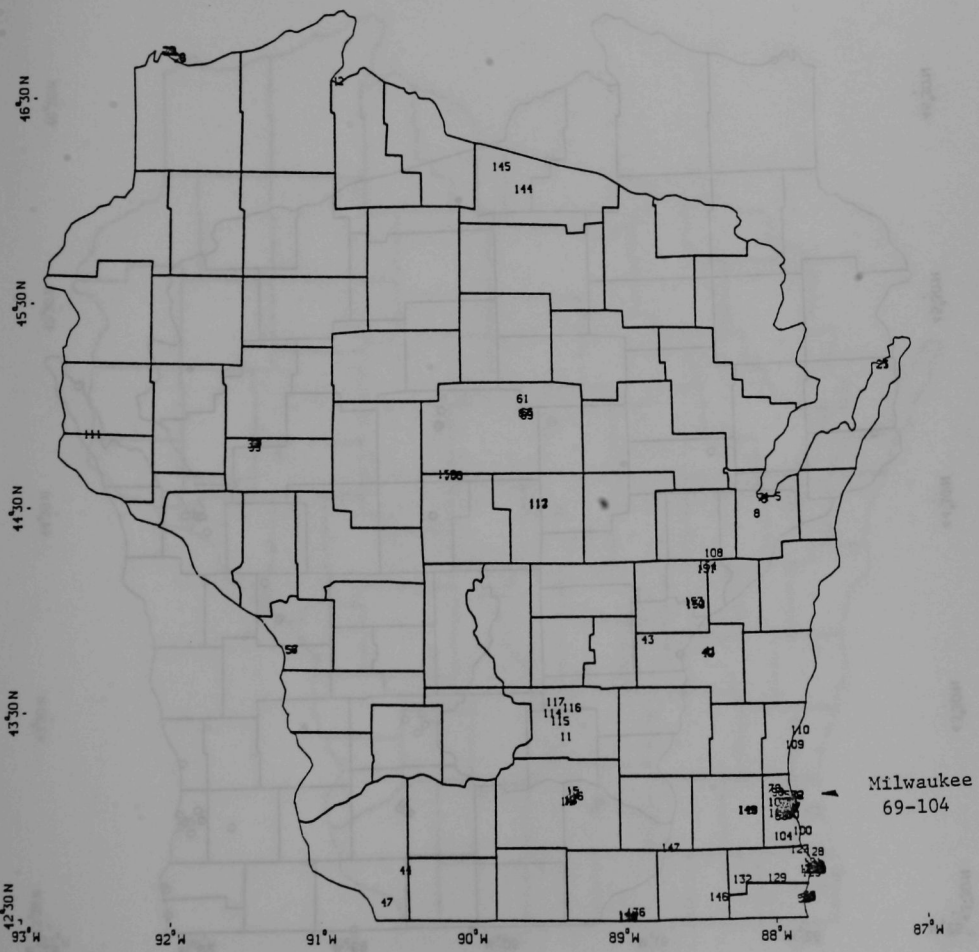


Fig. V.79. Wisconsin: Locations of SAROAD Monitors
(See Table V.16 for Monitor Numbers)

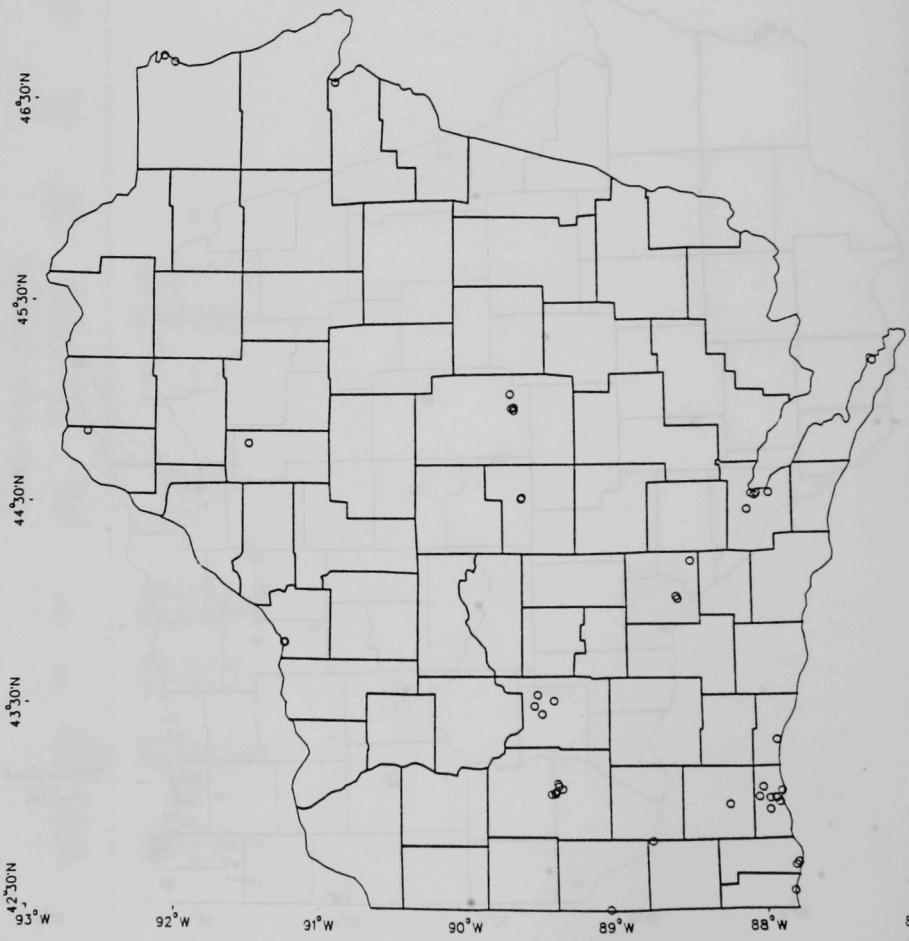


Fig. V.80. Wisconsin: Monitors Reporting Adequate Data on 24-hr Average SO_2; No Violations

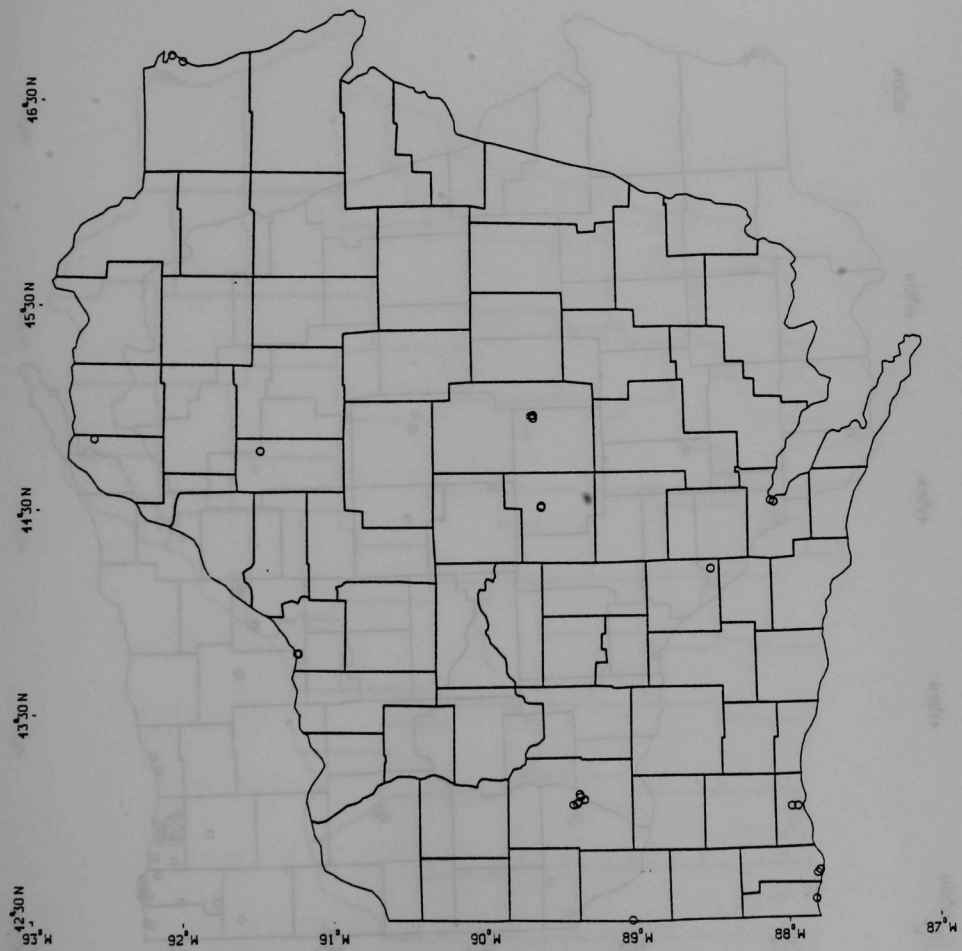


Fig. V.81. Wisconsin: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

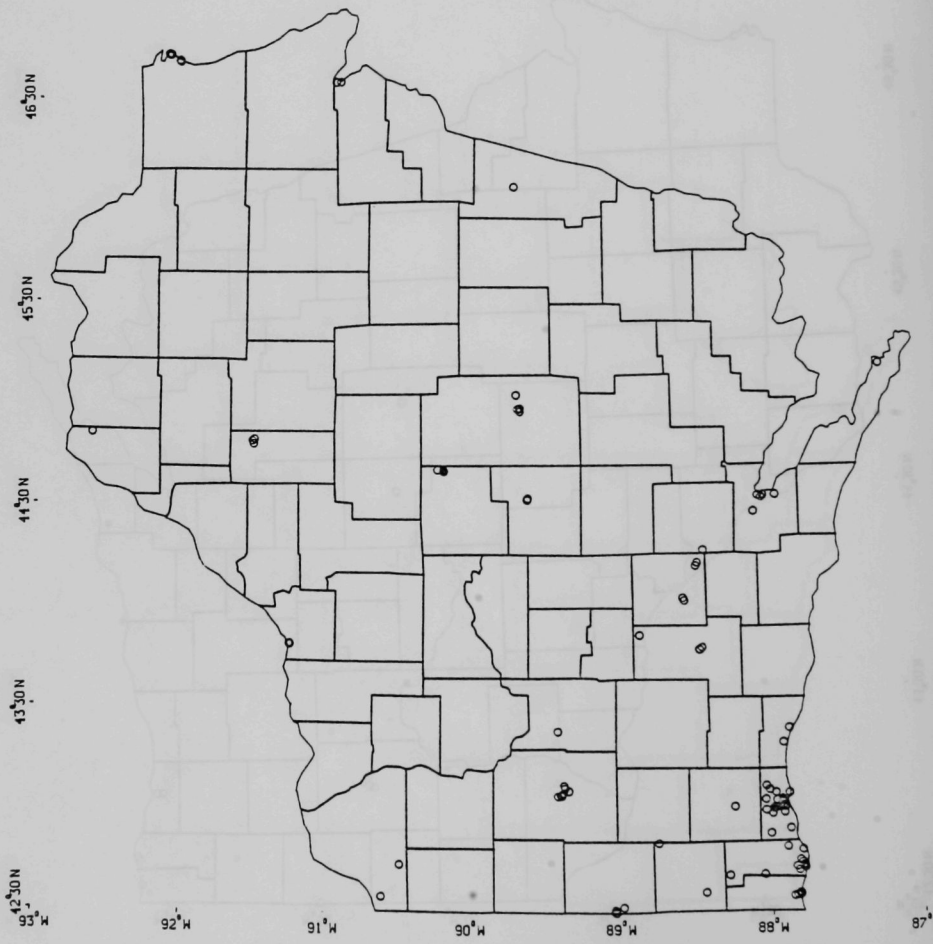


Fig. V.82. Wisconsin: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

Fig. V.83. Wisconsin: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

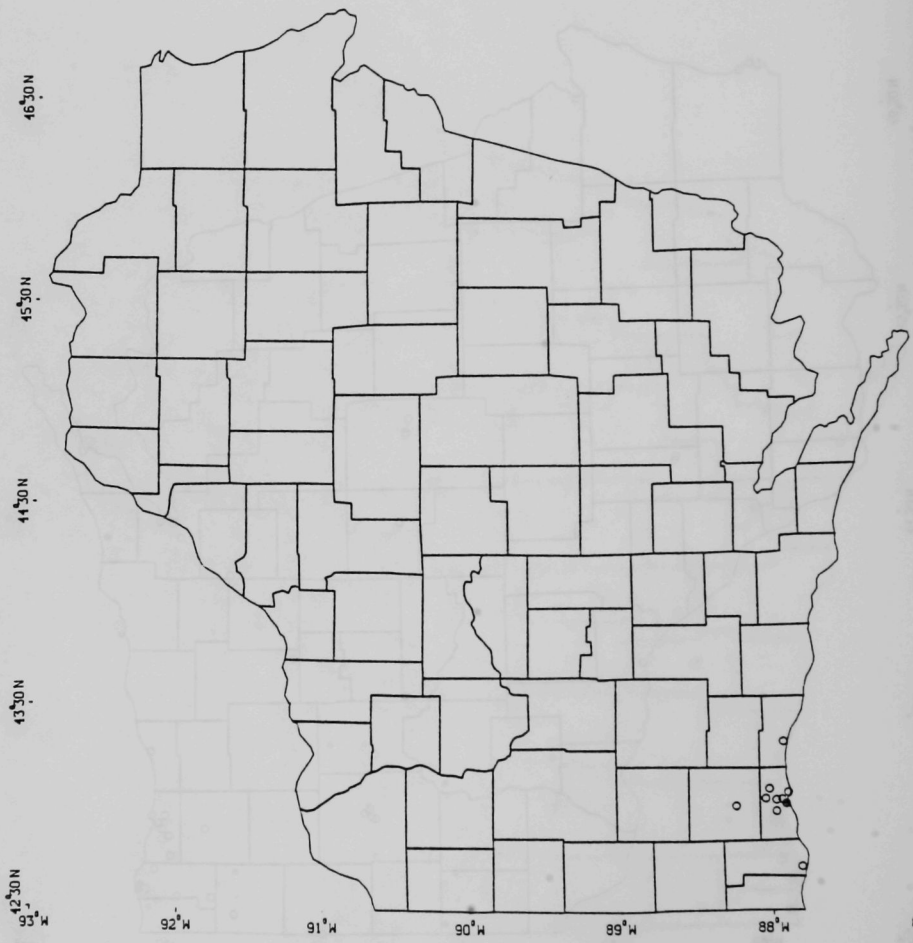


Fig. V.84. Wisconsin: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

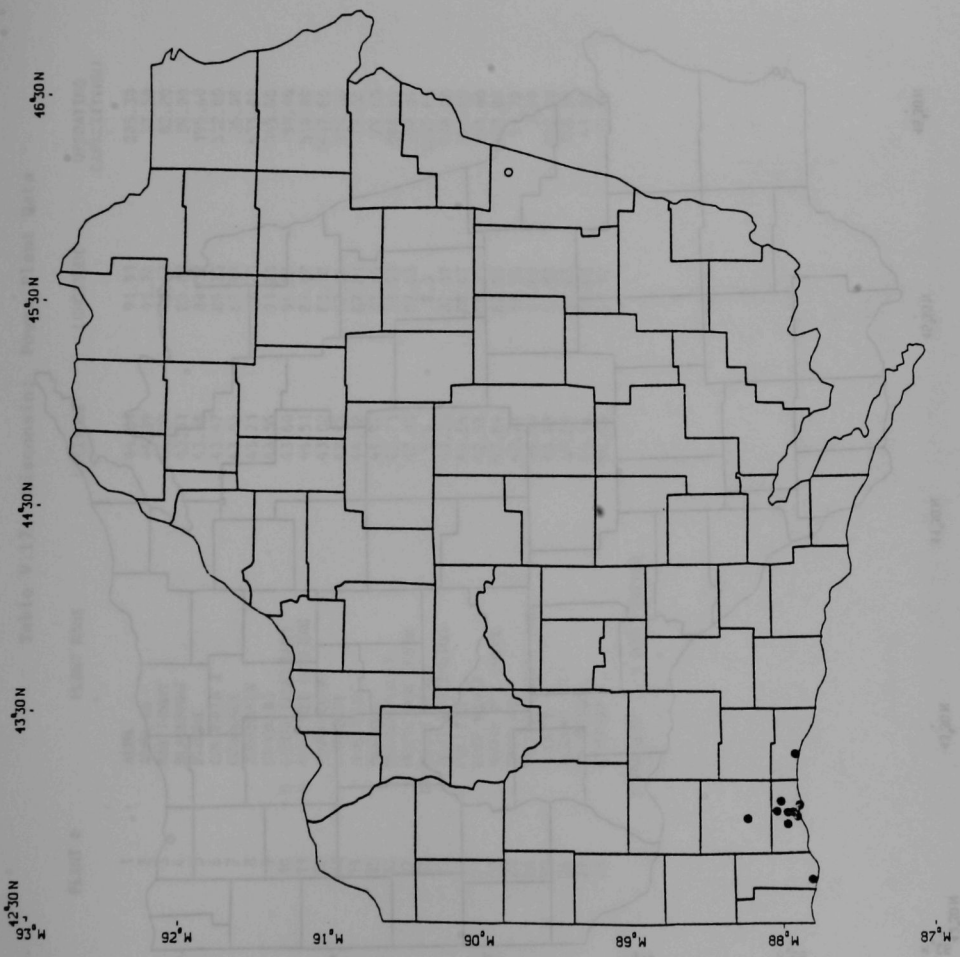


Fig. V.85. Wisconsin: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

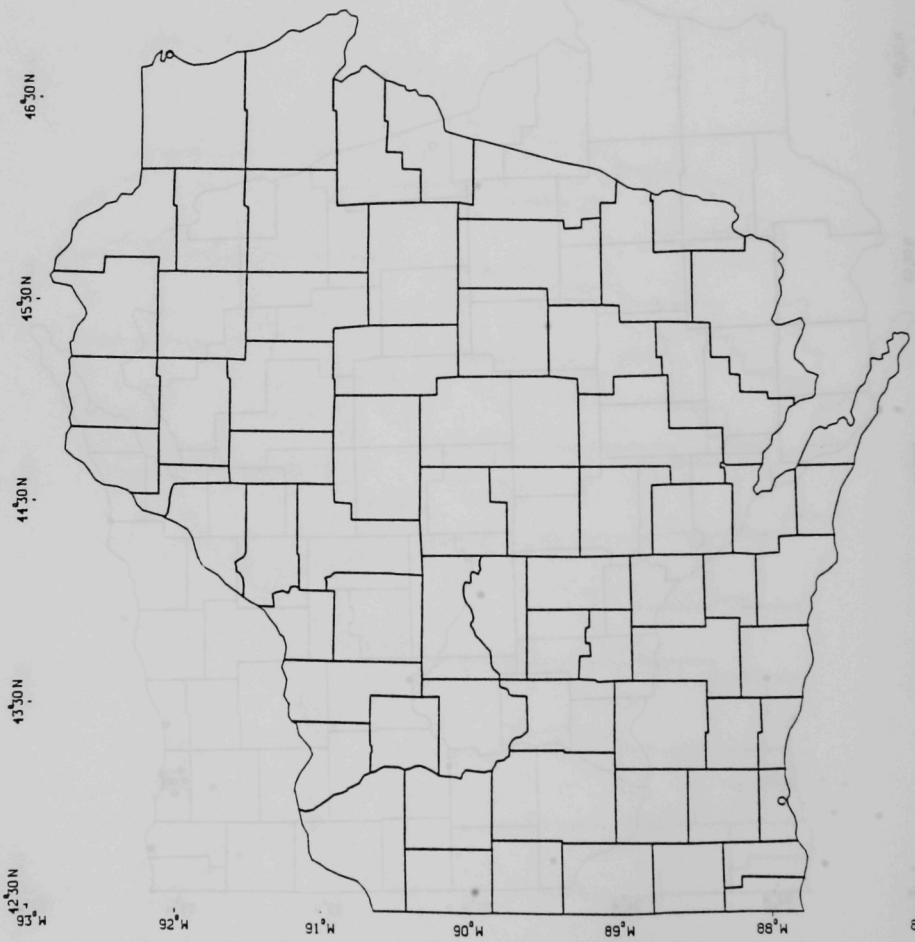


Fig. V.86. Wisconsin: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table V.17. Wisconsin: Power Plant Data

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		ALMA	44.31	91.91	205.30	0.0
2		ALMA #6	44.39	91.76	37.50	0.0
3		BAY FRONT	46.27	90.67	82.20	0.0
4		BLACKHAWK	42.51	89.02	59.00	0.0
5		BLOUNT	43.03	89.37	195.60	0.0
6		COLUMBIA I	43.47	89.33	512.00	0.0
7		COMMERCE	43.06	87.91	35.00	0.0
8		EDGEWATER	43.71	87.71	433.00	0.0
9		GENOA #3	43.56	91.23	345.60	0.0
10	N	GENOA (NUCLEAR)	43.60	90.83	50.00	0.0
11	N	KEWAUNEE NUCLEAR	44.51	87.62	540.00	0.0
12		KOSHKONONG	43.02	88.78	1047.60	0.0
13		LAKESIDE	42.98	87.86	310.00	0.0
14		MANITOWOC	44.12	87.81	69.00	0.0
15		MENASHA	44.07	88.64	29.68	0.0
16		NELSON DEWEY	42.71	90.98	203.00	0.0
17		NORTH OAK CREEK	42.85	87.83	500.00	0.0
18	N*	POINT BEACH	0.0	0.0	1047.60	0.0
19		PORT WASHINGTON	43.38	87.87	400.00	0.0
20		PULLIAM	44.54	88.01	392.50	0.0
21		ROCK RIVER	42.58	89.03	159.00	0.0
22		SOUTH OAK CREEK	42.84	87.83	1192.00	0.0
23		STONEMAN	42.71	90.98	51.75	0.0
24		TYRONE ENERGY PARK	44.95	91.90	7.50	0.0
25		VALLEY	43.03	87.93	272.00	0.0
26		WESTON	44.89	89.63	135.00	75.00
27		WILDWOOD	44.46	90.03	41.50	0.0
28		WINSLOW	46.43	91.92	25.00	0.0

N NUCLEAR * NOT PLOTTED

Table V.18. Wisconsin: Fuel Use Data

PLANT #		PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1		ALMA	2.76	502.20	0.30	4.70	0.0
2		ALMA #6	0.0	0.0	0.0	0.0	0.0
3		BAY FRONT	1.62	52.27	0.50	47.33	807.29
4		BLACKHAWK	2.87	22.53	0.30	0.46	829.56
5		BLOUNT	3.91	76.80	0.30	0.93	3976.91
6		COLUMBIA I	0.76	910.00	0.30	14.80	0.0
7		COMMERCE	0.0	0.0	0.20	7.19	2175.66
8		EDGEWATER	2.76	997.69	0.30	2.57	0.0
9		GENOA #3	2.85	801.10	0.30	10.21	0.0
10	N	GENOA (NUCLEAR)	0.0	0.0	0.0	0.67	0.0
11	N	KEWAUNEE NUCLEAR	0.0	0.0	0.0	0.0	0.0
12		KOSHKONONG	0.0	0.0	0.0	0.0	0.0
13		LAKESIDE	0.0	0.0	1.40	301.21	2851.07
14		MANITOWOC	1.30	142.53	0.0	0.0	0.0
15		MENASHA	2.11	58.13	0.0	0.0	0.0
16		NELSON DEWEY	4.90	512.44	0.03	0.61	0.0
17		NORTH OAK CREEK	1.79	823.65	0.20	3.17	0.0
18	N*	POINT BEACH	0.0	0.0	0.0	0.0	0.0
19		PORT WASHINGTON	3.09	691.07	0.0	0.0	0.0
20		PULLIAM	2.91	752.70	0.22	17.60	81.90
21		ROCK RIVER	2.53	293.32	0.30	4.23	0.0
22		SOUTH OAK CREEK	1.84	2046.09	0.20	27.60	0.0
23		STONEMAN	3.40	111.00	0.30	2.06	0.0
24		TYRONE ENERGY PARK	0.0	0.0	0.0	0.0	0.0
25		VALLEY	2.80	530.45	0.0	0.0	110.65
26		WESTON	3.07	239.30	0.22	4.50	2013.50
27		WILDWOOD	2.87	91.90	1.49	96.10	312.30
28		WINSLOW	0.0	0.0	0.0	0.0	347.10

N NUCLEAR * NOT PLOTTED

Fig. V.87. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

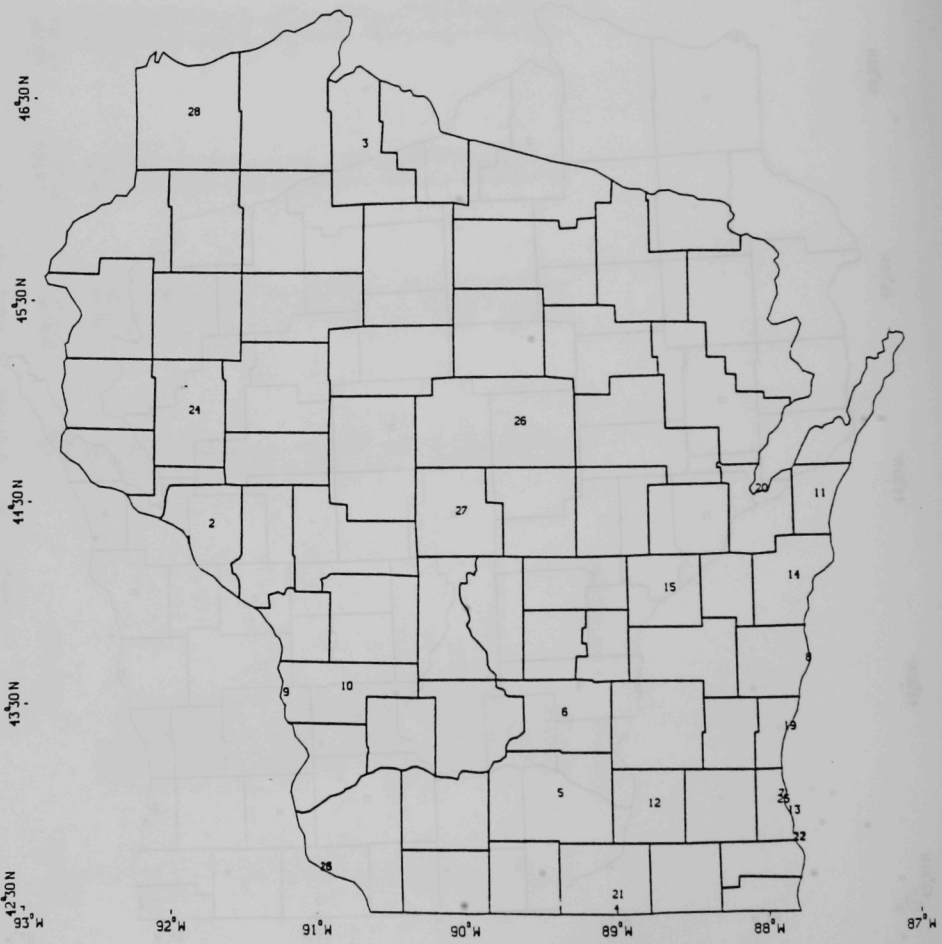


Fig. V.88. Power Plant Key (See Tables V.17 and V.18 for Identification and Fuel Use Data)

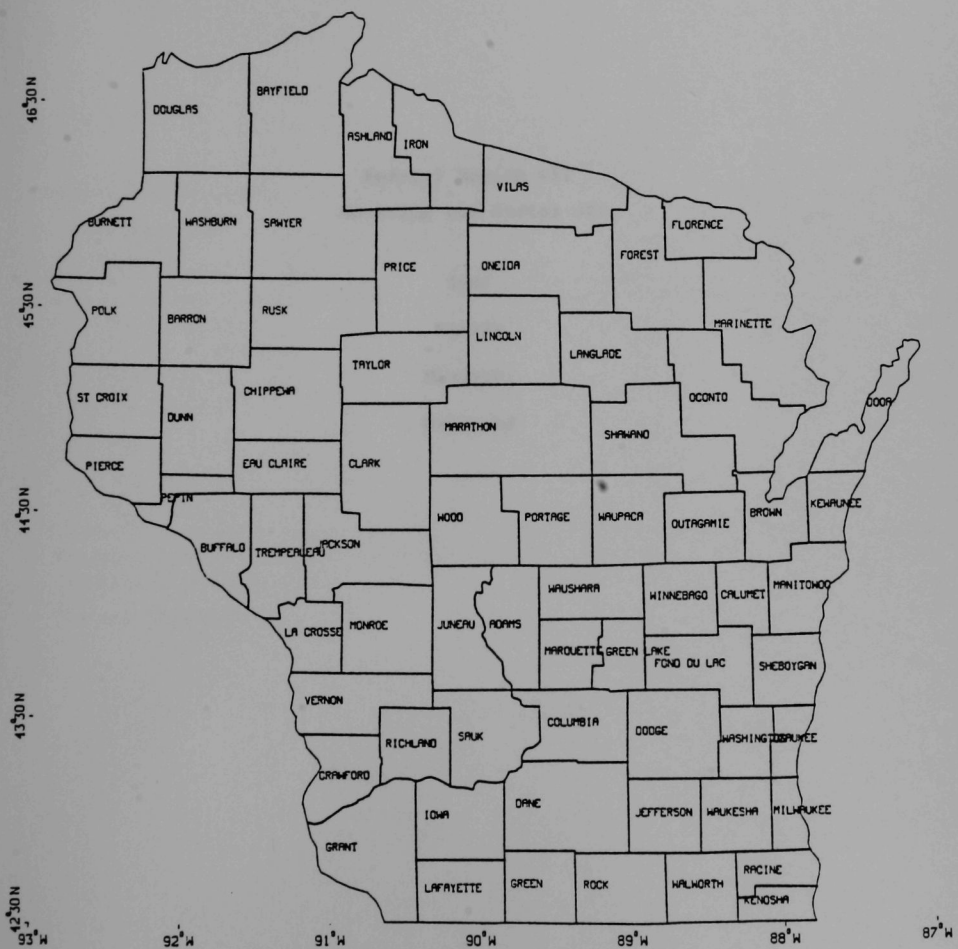


Fig. V.89. Wisconsin: Key to Counties

Federal Region VII

Covering the States of:

Iowa

Kansas

Missouri

Nebraska

REGION VII: IOWA

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a] Primary	Secondary	No. of Monitors	No. of Monitors Recording Primary Violations
SO_2	24 hr	1	0	32	0
	1 yr			20	0
TSP	24 hr	8	6	53	7
	1 yr			47	18
NO_x	1 yr	0[b]	-	5	0
CO	8 hr	1	-	3	2
O_x	1 hr	4	-	7	6

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	24
Nuclear	1
Total	25

IOWA (Official SIP, 6/79)

I. SOURCES OF THE PROBLEM

Iowa designated areas in eight counties as in nonattainment for the primary TSP standard and areas in four more counties as in nonattainment for the secondary standard. The rural fugitive dust allowance is judged to be of considerable importance to the state. The SIP notes that "the unique nature of Iowa's agricultural operations and secondary road system" (over 70% of the state's roads are unpaved) leads to large concentrations of road dust and wind blown soil. The exemption would mean that Iowa's "metropolitan areas would not be penalized by dust generated miles from their borders". In all counties except Linn (Cedar Rapids), Polk (Des Moines), and Scott (Davenport), the SIP attributes violations to wind blown soils and resuspended road dust. In Cedar Rapids, point source emissions make up 10% of the total particulates; industrial fugitive sources, 3%; and transportation, 85% (tail-pipes, tire fragments and brake linings, or resuspended road dust). In Davenport, the emission breakdown is 7%, flue; 7%, industrial fugitive; 2%, residential and commercial; and 84%, transportation (paved and unpaved roads). Des Moines' nonattainment is also considered to be the result of particulates for transportation, with some contribution from construction.

According to 1976-77 data, there is one SO_2 nonattainment area, Julien Township (Dubuque). Only one monitoring site recorded a violation in 1977. No cause of the 1977 violation has been determined and no violations have occurred since 1977.

Four counties in Iowa are designated as in nonattainment for O_x. Pottawatomie (Council Bluffs) County and Scott (Davenport) County ozone levels are heavily influenced by pollutant transport from Omaha and Rock Island, respectively, with motor vehicles producing significant levels of locally produced hydrocarbon precursors to ozone. In Linn county petroleum storage produces 7% of volatile organic compound (VOC) emissions, industrial processes, 8%; industrial surface coating, 20%; and motor vehicles emit almost 55% of the VOC produced. The bulk of VOC in Polk County (Des Moines) also comes from motor vehicles. In the one CO nonattainment area (in Polk County) mobile sources emit 97+% of the pollutant. There are no areas in nonattainment for NO_x.

A. SO_2

1. The state requests change of status to unclassified

B. TSP

1. Rural and small cities

   a. The state attributes violations to rural fugitive dust, temporary construction, or improper monitor siting

   b. The state requests reclassification to attainment or unclassified status.

2. Urban (Des Moines, Cedar Rapids, Davenport)

   a. Major stationary sources

      - no additional controls
      - RACT already required in SIP

   b. RACT for fugitive industrial emissions

   c. Road dust suppression

      - street paving, oiling, chemical stabilizing
      - additional cleaning with vacuum sweepers

   d. Regulation of construction practices

      - minimize exposure of soil
      - reduce tracking dirt onto roads

C. Ozone

1. Request redesignation of Polk and Pottawatomie counties to attainment due to recent relaxation of ozone standard (monitors show attainment of new standard)

2. Request redesignation of Scott County to unclassified due to standard relaxation and lack of data

3. Linn County

   a. Federal Motor Vehicle Emissions Control Program

   b. RACT for the major stationary sources of VOC

   c. Attainment by December 31, 1982 predicted

D. Carbon Monoxide

1. FMVECP

2. Inspection and maintenance

3. Traffic flow improvements

III. NEW SOURCE REVIEW

Planned emissions reductions of VOC will provide a VOC growth allowance. The rural fugitive dust approach obviates much of the need for a special new source review for TSP nonattainment areas, but in the remaining urbanized nonattainment areas an emissions offset policy will be in force. Each ton of additional emissions must be matched with a reduction of 1.25 tons from existing sources in primary nonattainment areas and 1.1 tons from areas not achieving secondary NAAQS. Excess emission reductions may be banked. Fuel burning sources using coal and oil are required to submit a permit if the capacity is over 1 MM Btu/hr.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. Existing coal-burning sources (effective 7/76 for units operating before 9/70)

   a. With heat input > 500 MM Btu/hr: 8 lb SO_2/MM Btu

   b. In Black Hawk, Clinton, Des Moines, Dubuque, Jackson, Lee, Linn, Louisa, Muscatine, and Scott Counties: sources with heat input of 7500 MM Btu/hr: 6.0 lb SO_2/MM Btu

2. New sources (operating after 9/70)

   a. With heat input < 250 MM Btu/hr: 6.0 lb SO_2/MM Btu

   b. With heat input > 250 MM Btu/hr: NSPS

B. TSP

1. Existing sources

   a. Inside any Standard Metropolitan Statistical Area (SMSA)

      - 0.6 lb PM/MM Btu, regardless of stack height

   b. Outside any SMSA

      - 0.8 lb PM/MM Btu, regardless of stack height

2. New sources

   a. With heat input > 250 MM Btu/hr: NSPS

   b. For which 150 < heat input < 250 MM Btu/hr: 0.2 lb PM/MM Btu

   c. With heat input < 150 MM Btu/hr, 0.6 lb PM/MM Btu

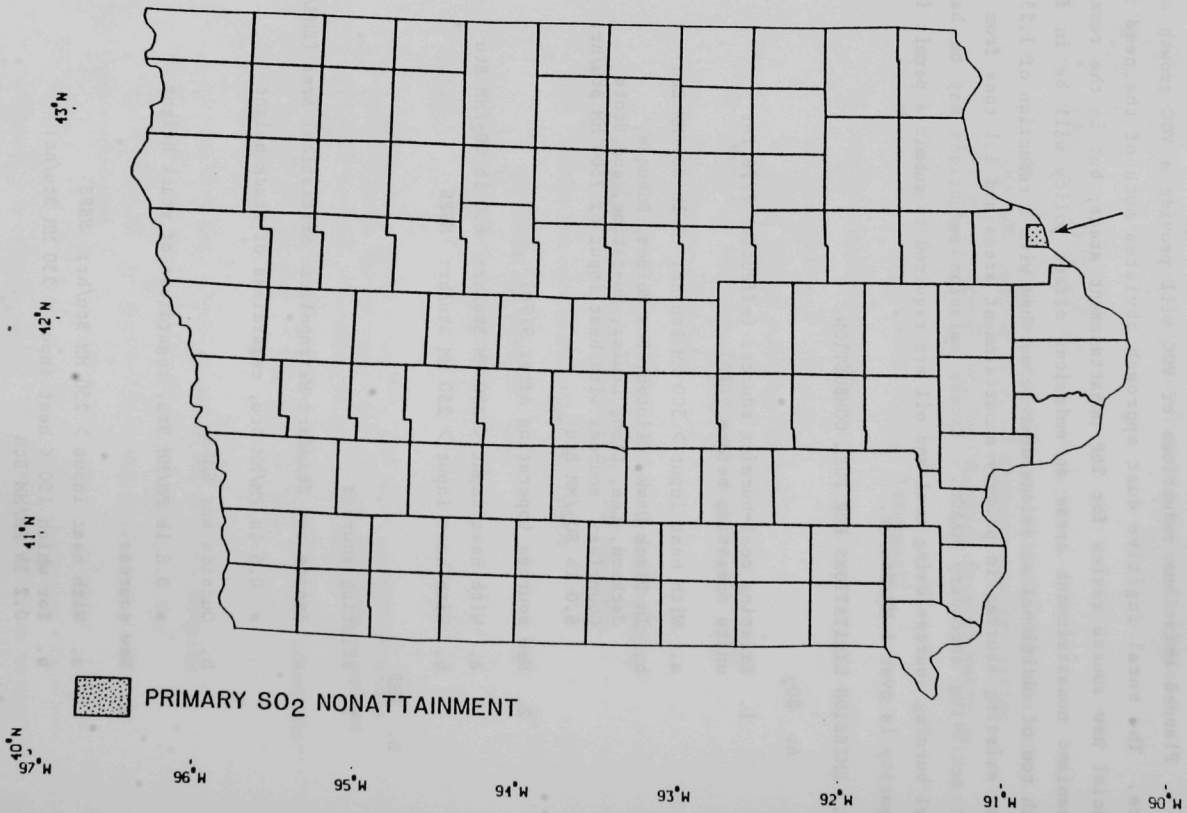


Fig. VII.90. Iowa: SO_2 Nonattainment Areas as Designated May 1979

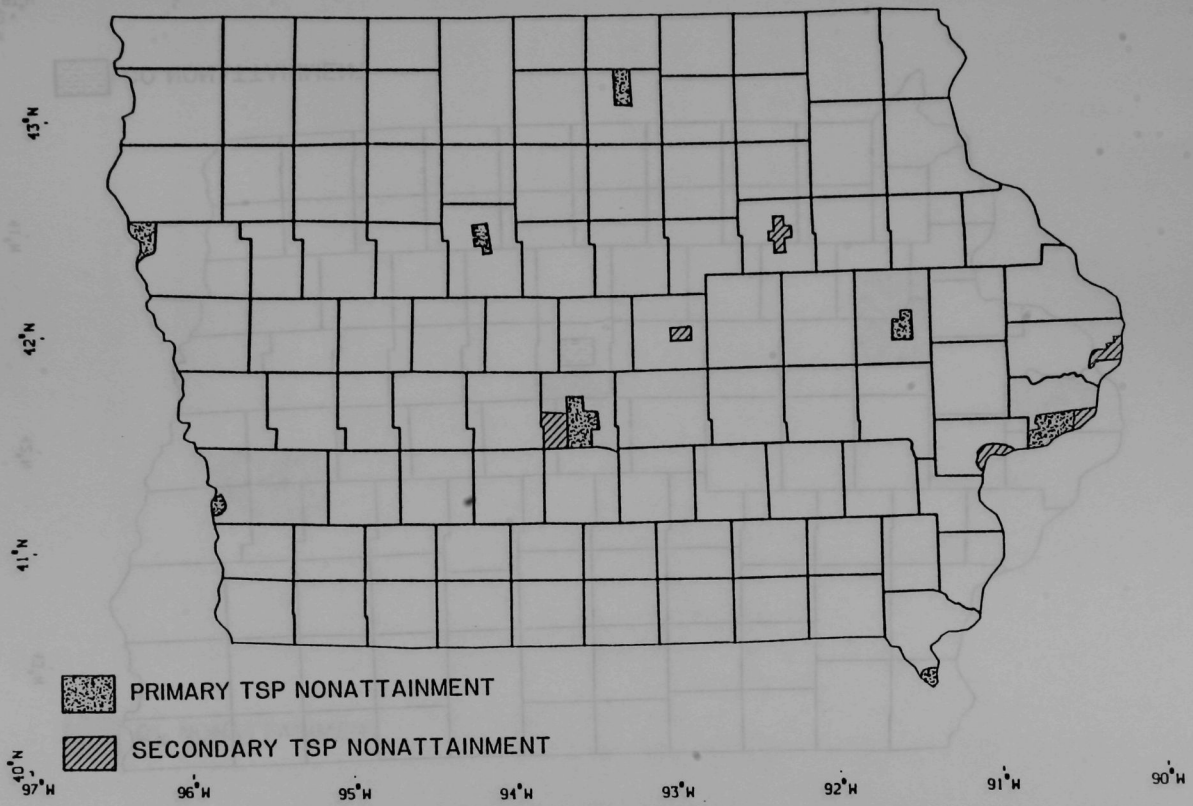


Fig. VII.91. Iowa: TSP Nonattainment Areas as Designated May 1979

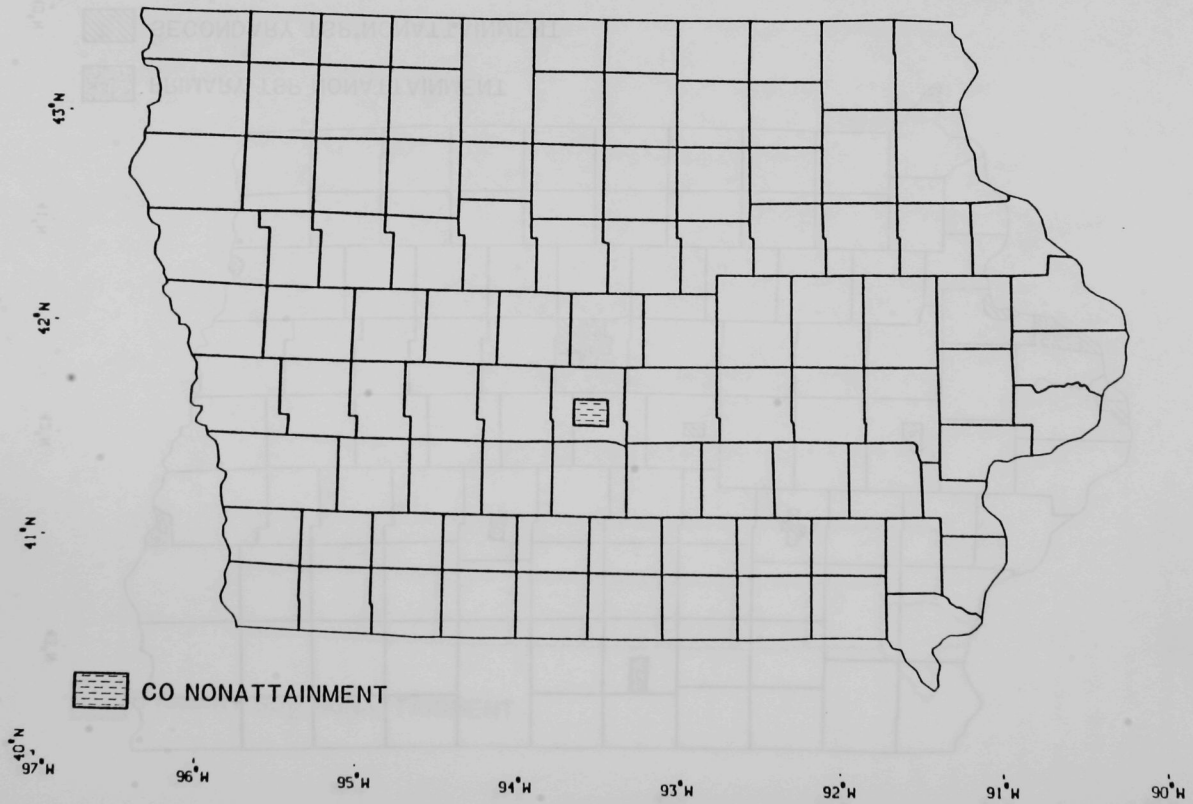


Fig. VII.92. Iowa: CO Nonattainment Areas as Designated May 1979

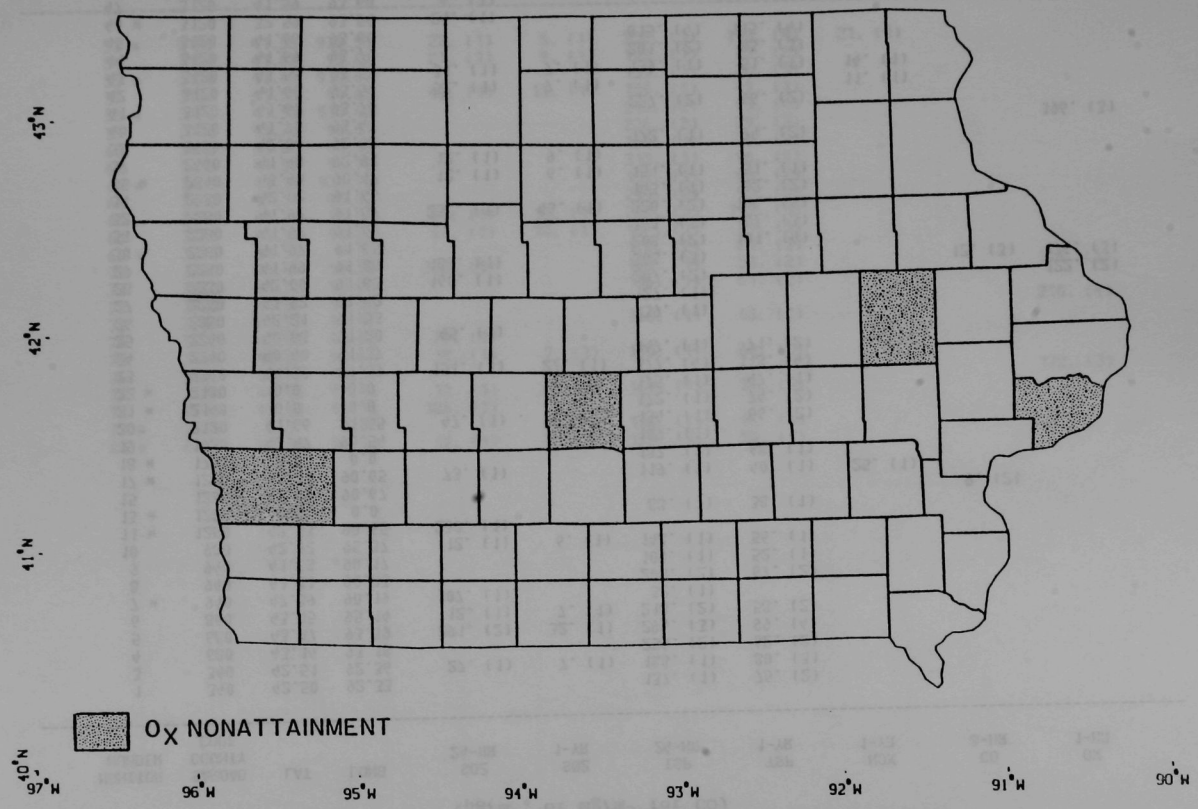


Fig. VII.93. Iowa: O_X Nonattainment Areas as Designated May 1979

Table VII.19. Iowa: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	340	42.50	92.33			137. (1)	75. (2)			
3	340	42.51	92.36	27. (1)	7. (1)	183. (1)	80. (3)			
4	680	43.14	93.18			254. (2)	62. (2)			
5	680	43.17	93.19	291. (2)	32. (1)	294. (3)	99. (4)			
6	860	43.15	95.14	12. (1)	7. (1)	210. (2)	58. (2)			
7 *	940	47.89	90.19	107. (1)		32. (1)				
8	940	41.81	90.23			206. (2)	67. (2)			
9	940	41.88	90.17			109. (1)	52. (1)			
10	980	42.02	95.37	12. (1)	6. (1)	148. (1)	56. (1)			
11 *	1280	42.53	90.65	230. (1)						
13 *	1280	0.0	0.0			83. (1)	38. (1)			
15	1280	42.49	90.67						9. (2)	
17 *	1280	42.53	90.65	73. (1)		119. (1)	40. (1)	25. (1)		
18 *	1700	0.0	0.0			187. (1)	48. (1)			
19	1920	42.47	95.54			109. (1)				
20	2120	41.66	91.55	47. (1)	12. (1)	134. (1)	66. (2)			
21 *	2140	0.0	0.0			172. (1)	74. (2)			
22 *	2180	0.0	0.0			175. (1)	47. (1)			
23	2240	40.39	91.39	151. (1)	27. (1)	377. (4)	118. (4)			
24	2240	40.40	91.37			147. (1)	71. (2)			
25	2240	40.63	91.20	45. (1)						
26	2280	42.21	91.53			139. (1)				
27	2280	41.92	91.42			127. (1)				
28	2280	42.00	91.63	160. (1)		207. (2)				122. (2)
29	2280	41.99	91.66	187. (1)		368. (3)			12. (3)	176. (3)
30	2280	41.97	91.65			208. (2)	101. (4)			
31	2280	41.97	91.67			161. (1)	87. (3)			
32	2280	41.97	91.67	252. (1)	46. (1)	220. (2)	104. (4)			
34	2280	42.02	91.66			163. (1)	62. (2)			
35 *	2340	43.43	90.17	12. (1)	6. (1)	154. (1)	51. (1)			
37	2460	41.40	92.91	12. (1)	9. (1)					
33	2480	42.06	92.92			172. (1)	74. (2)			
40	3120	41.70	93.47							196. (3)
41	3120	41.67	93.70			227. (2)	66. (2)			
42	3120	41.60	93.51	52. (1)	7. (1)			11. (1)		
43	3120	41.53	93.53	31. (1)	7. (1)	139. (1)	51. (1)	14. (1)		
44	3120	41.69	93.79			201. (2)	83. (3)			
45	3120	41.66	93.60			615. (4)	115. (4)			
46 *	3120	32.59	93.54	24. (1)						
47	3120	41.59	93.60	6. (1)						
48	3120	41.67	93.62							192. (3)
49 *	3120	0.0	0.0	19. (1)	5. (1)			40. (1)		
50	3120	41.53	93.68	22. (1)						
51	3120	41.59	93.62						19. (4)	
52	3120	41.54	93.60			157. (1)	74. (2)			

Table VII.19. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
53 *	3120	41.58	930.58	22. (1)	5. (1)	288. (3)	110. (4)	21. (1)		
54	3120	41.62	93.62	21. (1)	9. (1)	192. (1)	73. (2)			
55 *	3120	41.60	930.67			155. (1)	78. (3)			
57	3120	41.58	90.63	49. (1)	13. (1)	159. (1)	49. (1)			
58 *	3120	41.58	930.62			216. (2)	96. (4)			
59	3120	41.73	93.61			226. (2)	79. (3)			
60	3120	41.65	93.46			169. (1)	70. (2)			
61	3120	41.57	93.72			318. (3)	96. (4)			
62 *	3120	41.58	930.72			149. (1)	63. (2)			
64	3140	41.27	95.92			211. (2)	95. (4)			
65	3140	41.26	95.85	29. (1)	10. (1)	282. (3)	115. (4)			
68	3280	41.53	90.58	41. (1)	10. (1)	182. (1)	85. (3)			
69 *	3230	41.50	9.63			198. (2)	86. (3)			
70	3280	41.49	90.54	202. (1)		166. (1)	53. (2)			196. (3)
71	3280	41.52	90.60			136. (1)	61. (2)			
72	3280	41.66	90.59							210. (4)
73	3280	41.55	90.47			106. (1)	48. (1)			
74	3480	42.02	93.62	74. (1)						
75	3480	42.03	93.64	12. (1)	7. (1)	150. (1)	60. (2)			
76	3600	41.03	94.36							172. (3)
77	3680	40.95	92.41	12. (1)	6. (1)	160. (1)	78. (3)			
78	3700	41.52	93.43	128. (1)						
79 *	3840	0.0	0.0			138. (1)	42. (1)			
80 *	4020	42.50	90.41	12. (1)	6. (1)	135. (1)	50. (1)			

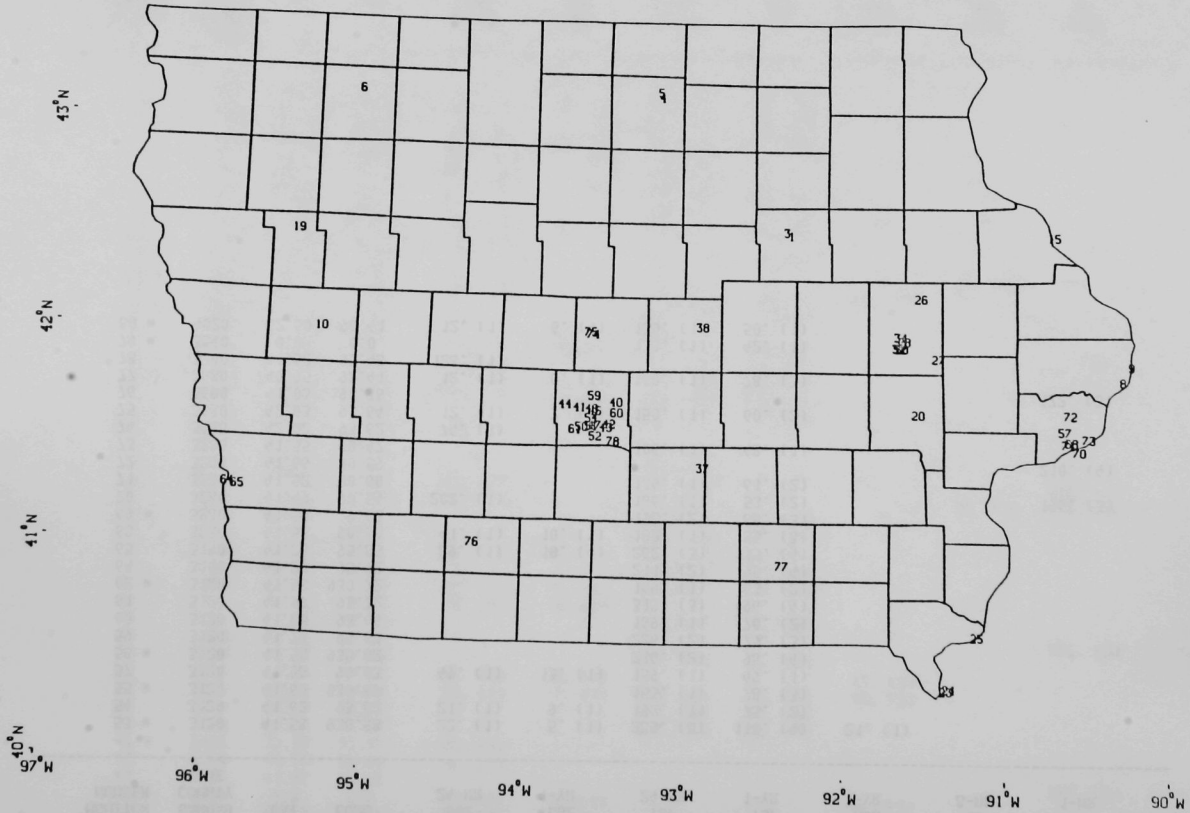


Fig. VII.94. Iowa: Locations of SAROAD Monitors
(See Table VII.19 for Monitor Numbers)

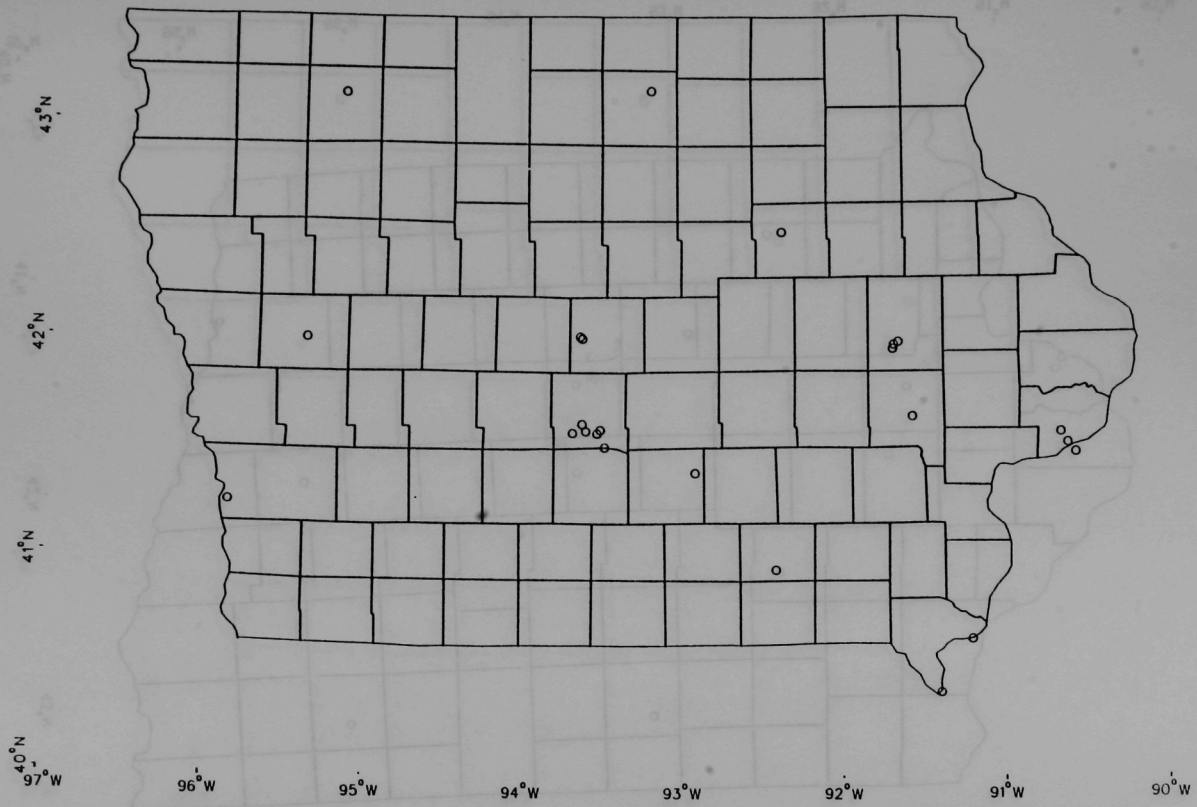


Fig. VII.95. Iowa: Monitors Reporting Adequate Data on 24-hr Average SO_2; No Violations

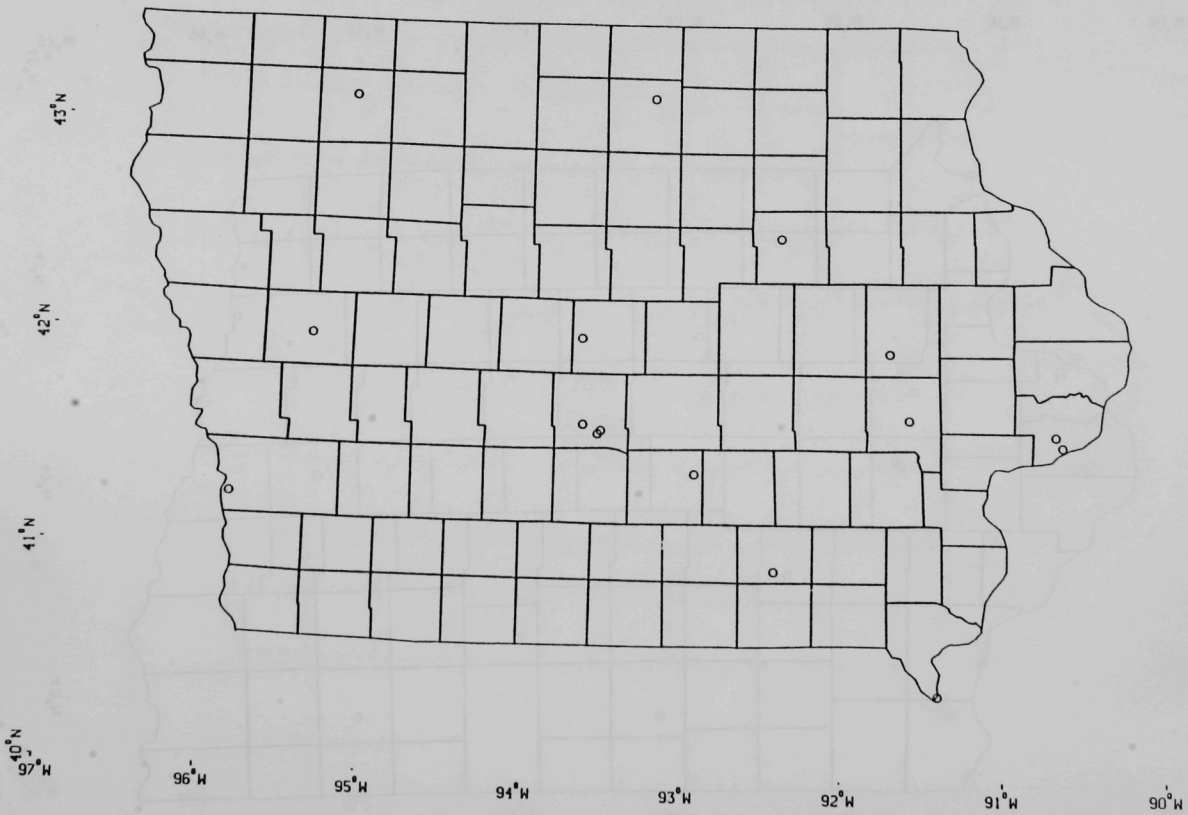


Fig. VII.96. Iowa: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

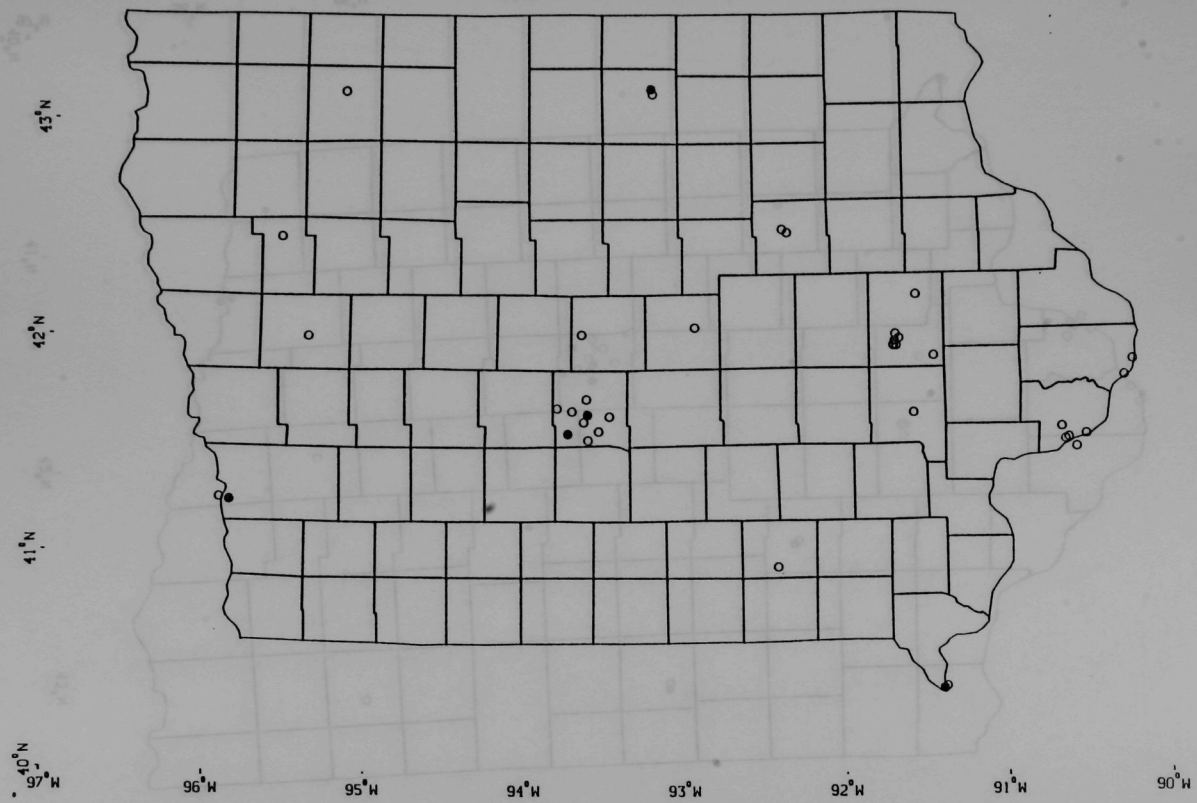


Fig. VII.97. Iowa: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

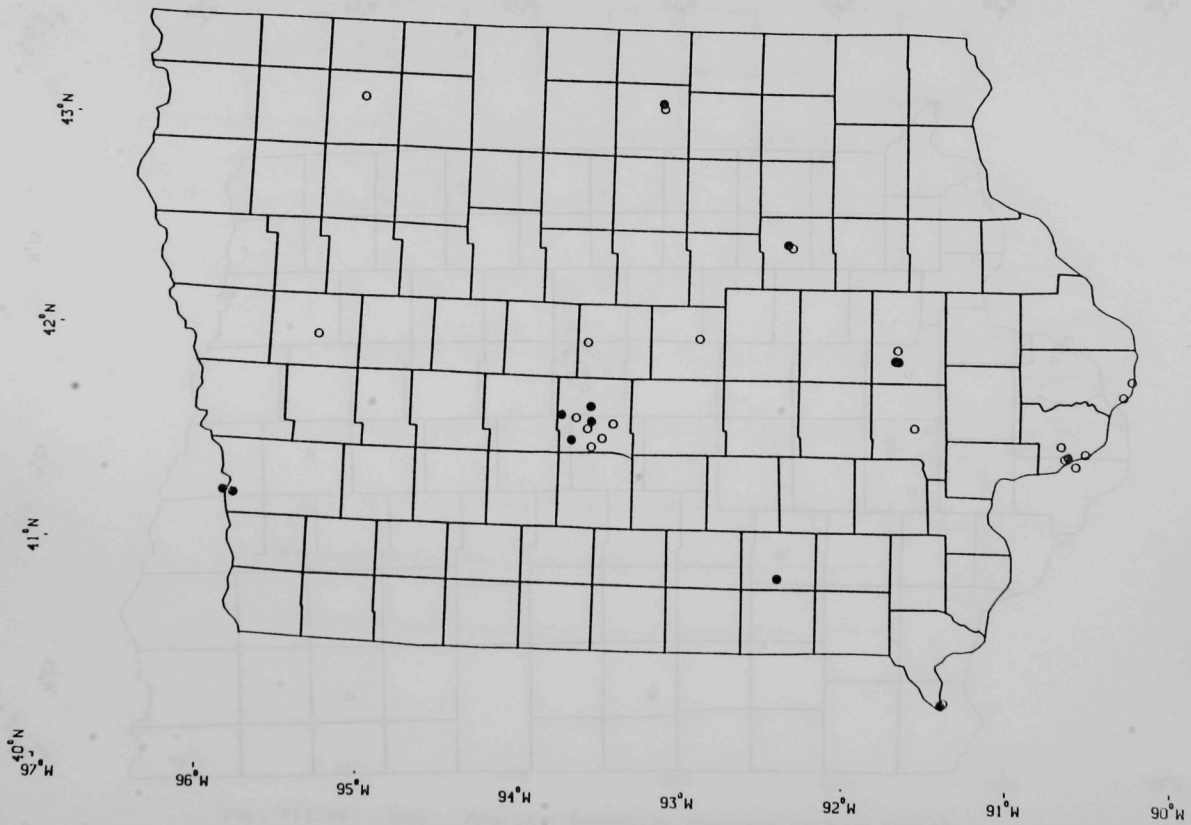


Fig. VII.98. Iowa: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

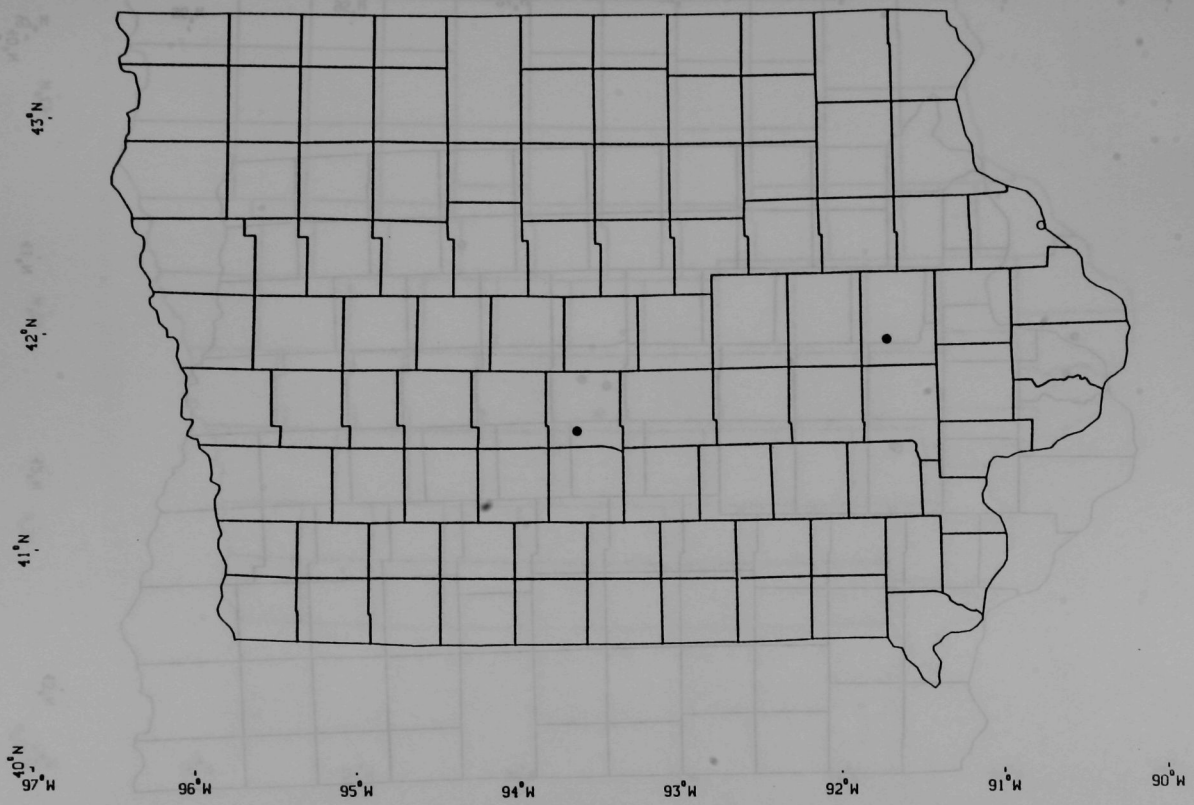


Fig. VII.99. Iowa: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

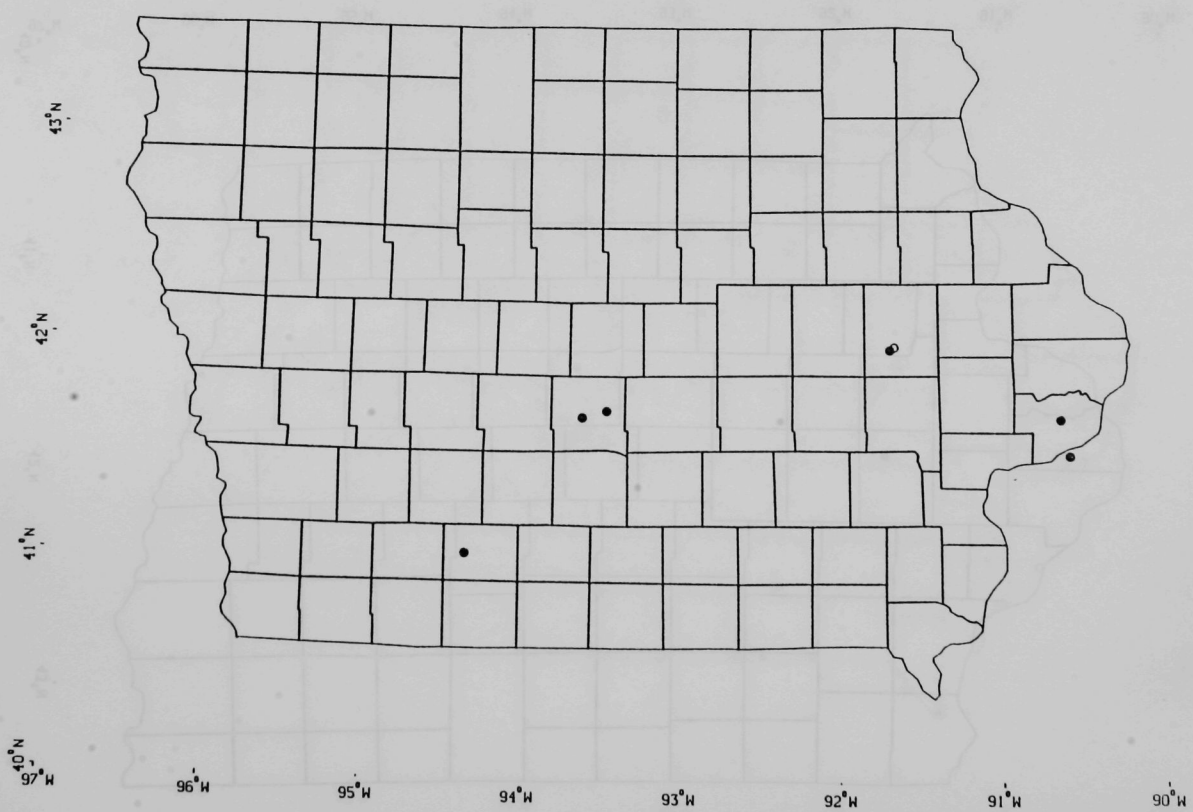


Fig. VII.100. Iowa: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

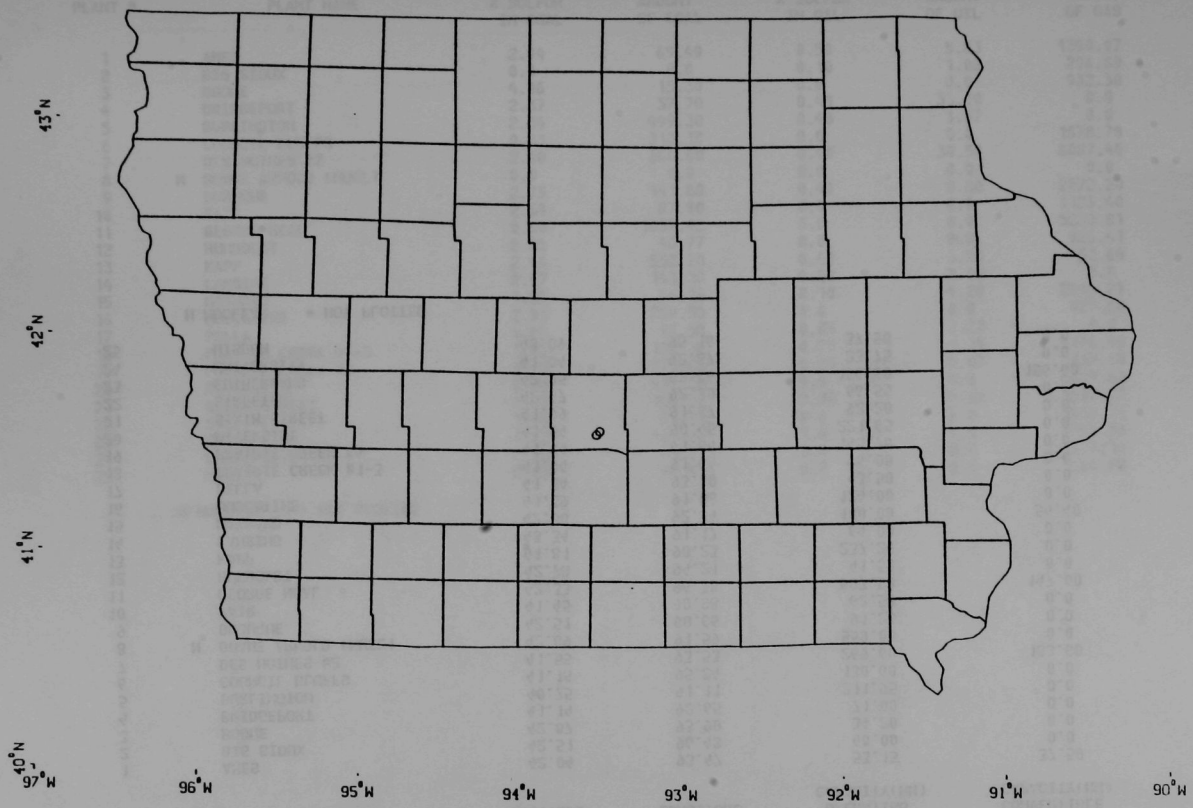


Fig. VII.101. Iowa: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table VII.20. Iowa: Power Plant Data

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		AMES	42.04	93.47	53.15	37.50
2		BIG SIOUX	42.51	96.43	40.00	0.0
3		BOONE	42.07	93.90	34.20	0.0
4		BRIDGEPORT	41.14	92.65	71.00	0.0
5		BURLINGTON	40.75	91.11	211.95	0.0
6		COUNCIL BLUFFS	41.13	95.84	130.60	0.0
7		DES MOINES #2	41.55	93.53	269.60	183.60
8	N	DUANE ARNOLD (NUCL)	42.09	91.59	550.00	0.0
9		DUBUQUE	42.51	90.66	91.25	0.0
10		FAIR	41.45	90.83	62.50	0.0
11		GEORGE NEAL	42.33	96.38	997.00	147.00
12		HUMBOLDT	42.78	94.21	41.50	0.0
13		KAPP	41.81	90.23	237.20	0.0
14		LANSING	43.34	91.17	64.00	0.0
15		MAYNARD	42.50	92.34	100.00	54.40
16		MUSCATINE	41.39	91.06	124.00	0.0
17		PELLA	41.34	93.10	43.50	0.0
18		PRAIRIE CREEK #1-3	41.94	91.64	96.00	0.0
19		PRAIRIE CREEK #4	41.94	91.64	148.70	0.0
20		RIVERSIDE	41.54	90.45	221.65	0.0
21		SIXTH STREET	41.99	91.67	92.20	0.0
22		STREETER	42.47	92.30	66.55	0.0
23		SUTHERLAND	42.05	92.86	156.60	156.60
24		UNIVERSITY	41.64	92.87	23.75	0.0
25		WISDOM	43.09	95.16	37.50	0.0

N NUCLEAR * NOT PLOTTED

Table VII.21. Iowa: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	AMES	2.94	69.40	0.50	5.83	1390.07
2	BIG SIOUX	0.0	0.0	0.10	1.03	296.89
3	BOONE	4.16	15.30	0.0	0.0	932.30
4	BRIDGEPORT	2.37	57.70	0.40	35.10	0.0
5	BURLINGTON	2.34	499.30	0.40	1.07	0.0
6	COUNCIL BLUFFS	0.81	313.10	0.0	0.0	1678.70
7	DES MOINES #2	2.60	366.60	0.40	30.50	8007.40
8	N DUANE ARNOLD (NUCL)	0.0	0.0	0.0	0.0	0.0
9	DUBUQUE	2.75	141.80	0.40	0.80	2072.20
10	FAIR	2.69	87.90	0.0	0.0	1186.40
11	GEORGE NEAL	0.60	1037.42	0.0	0.0	5280.81
12	HUMBOLDT	2.56	40.77	0.0	0.0	926.41
13	KAPP	2.44	552.20	0.40	3.50	52.60
14	LANSING	2.47	143.30	0.50	2.00	0.0
15	MAYNARD	1.05	46.14	0.10	4.29	2898.27
16	MUSCATINE	2.91	250.50	0.0	0.0	407.80
17	PELLA	4.65	94.50	0.05	2.22	0.0
18	PRAIRIE CREEK #1-3	1.91	132.70	0.25	1.14	1176.40
19	PRAIRIE CREEK #4	1.73	271.66	0.25	2.07	157.60
20	RIVERSIDE	2.74	431.80	0.0	0.0	4607.60
21	SIXTH STREET	2.27	154.70	0.30	0.60	1677.70
22	STREETER	1.87	63.76	0.0	0.0	1068.70
23	SUTHERLAND	1.92	164.60	0.0	0.0	5396.00
24	UNIVERSITY	2.16	65.77	0.0	0.0	1577.11
25	WISDOM	2.93	42.87	0.0	0.0	660.68

N NUCLEAR * NOT PLOTTED

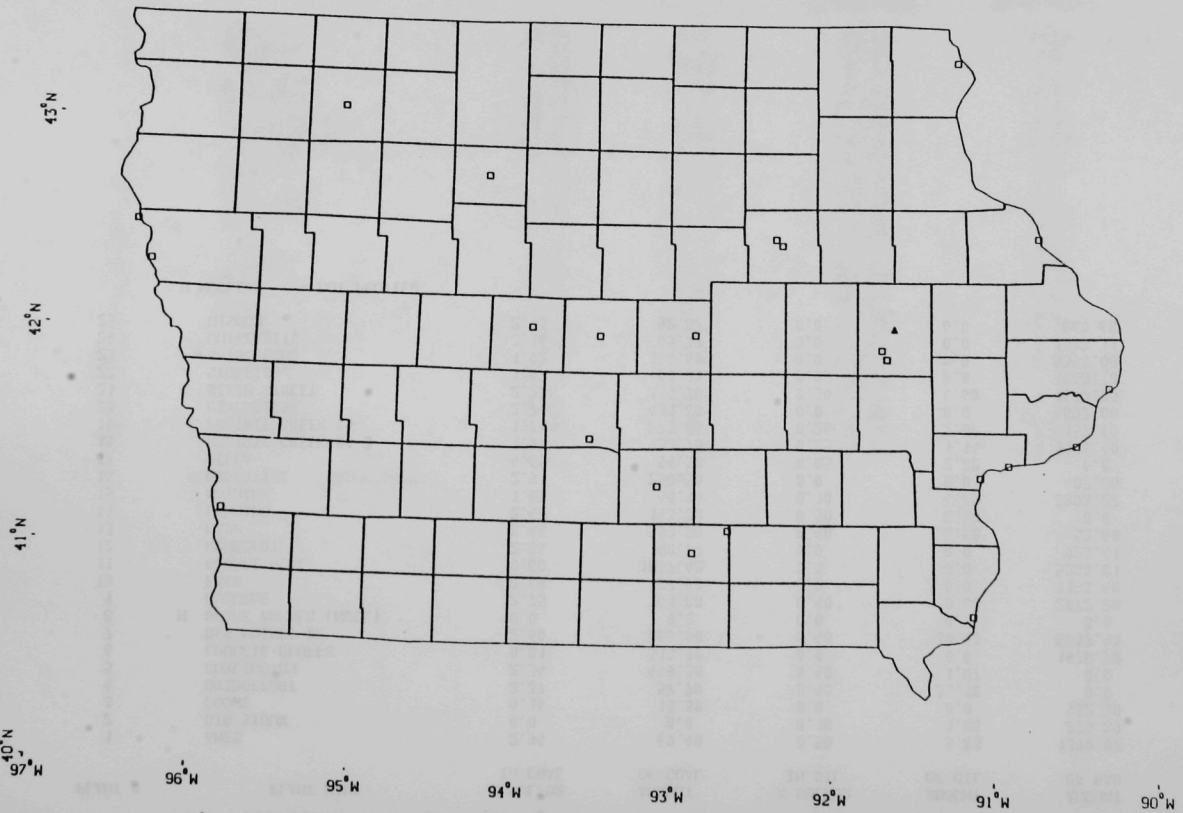


Fig. VII.102. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

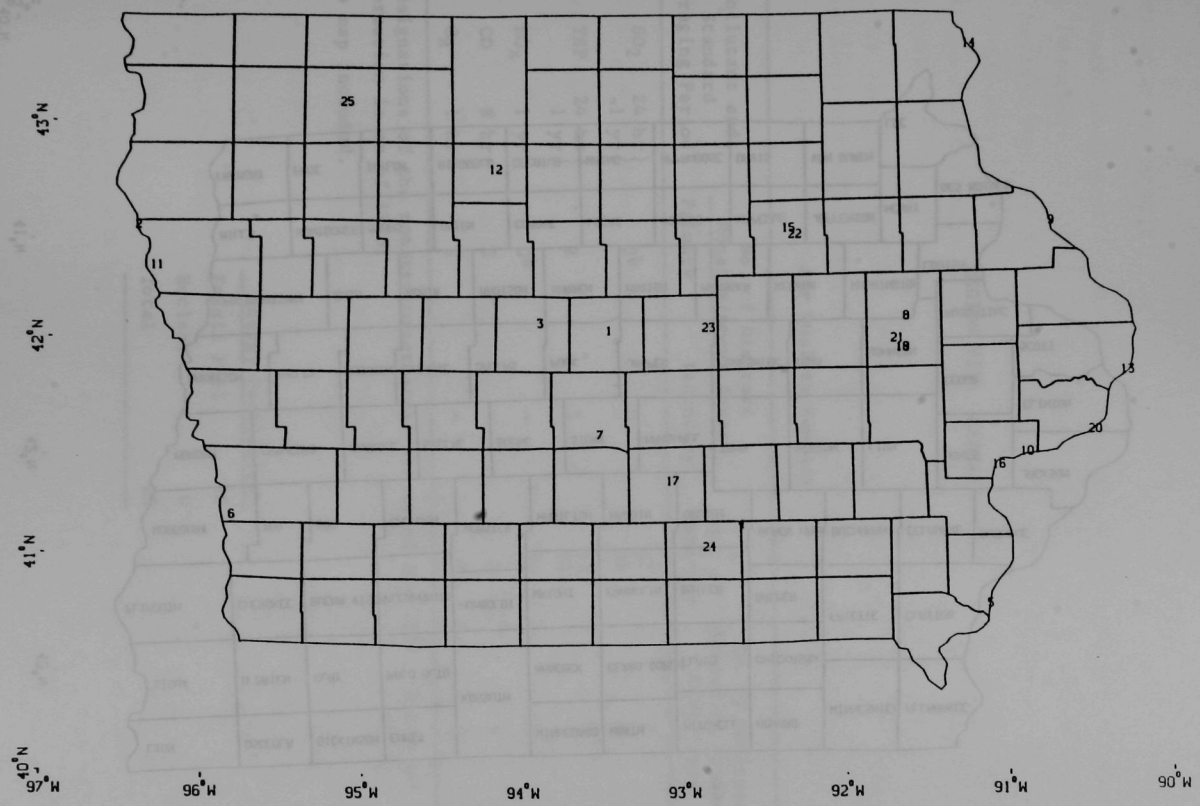


Fig. VII.103. Power Plant Key (See Tables VII.20 and VII.21 for Identification and Fuel Use Data)

Fig. VII.104. Iowa: Key to Counties

REGION VII: KANSAS

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a] Primary	Secondary	No. of Monitors	No. of Monitors Recording Primary Violations
SO_2	24 hr	0[b]	0	47	1
	1 yr			36	0
TSP	24 hr	2	1	63	3
	1 yr			53	7
NO_x	1 yr	0[b]	-	34	0
CO	8 hr	2	-	8	4
O_x	1 hr	2	-	7	3

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	20
Nuclear	0
Total	20

KANSAS (Draft SIP, to be reviewed)

I. SOURCES OF THE PROBLEM

Kansas designated nonattainment areas for the primary TSP standard in Topeka (Shawanee Co.) and in Kansas City (Wyandotte Co.). In both areas, urban fugitive dust was considered to be the source of violation, in particular reentrained road dust from motor vehicle traffic. Carbon monoxide exceedances due to transportation emissions have occurred in both Kansas City and Wichita.

EPA designated the Kansas City AQCR (Wyandotte and Johnson Counties) and the Northeast AQCR (Douglas Co. around Lawrence) as in nonattainment for ozone. In addition, the state designated Sedgwick Co. (around Wichita) as an O_x nonattainment area. The Lawrence exceedances were judged to be the result of transport of pollutants from the Kansas City area. In both Kansas City and Wichita, mobile sources were the primary source of emissions, with attainment expected to be achieved through FMVECP. Kansas' SIP submittals were delayed; the ozone plan for Kansas City was submitted in October, 1979.

II. ATTAINMENT STRATEGIES

A. TSP

1. Draft strategy for Kansas City was being totally reviewed 11/79

B. CO

1. Wichita - voluntary inspection and maintenance of motor vehicles

III. NEW SOURCE REVIEW

Kansas expects to use an emission offset policy.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

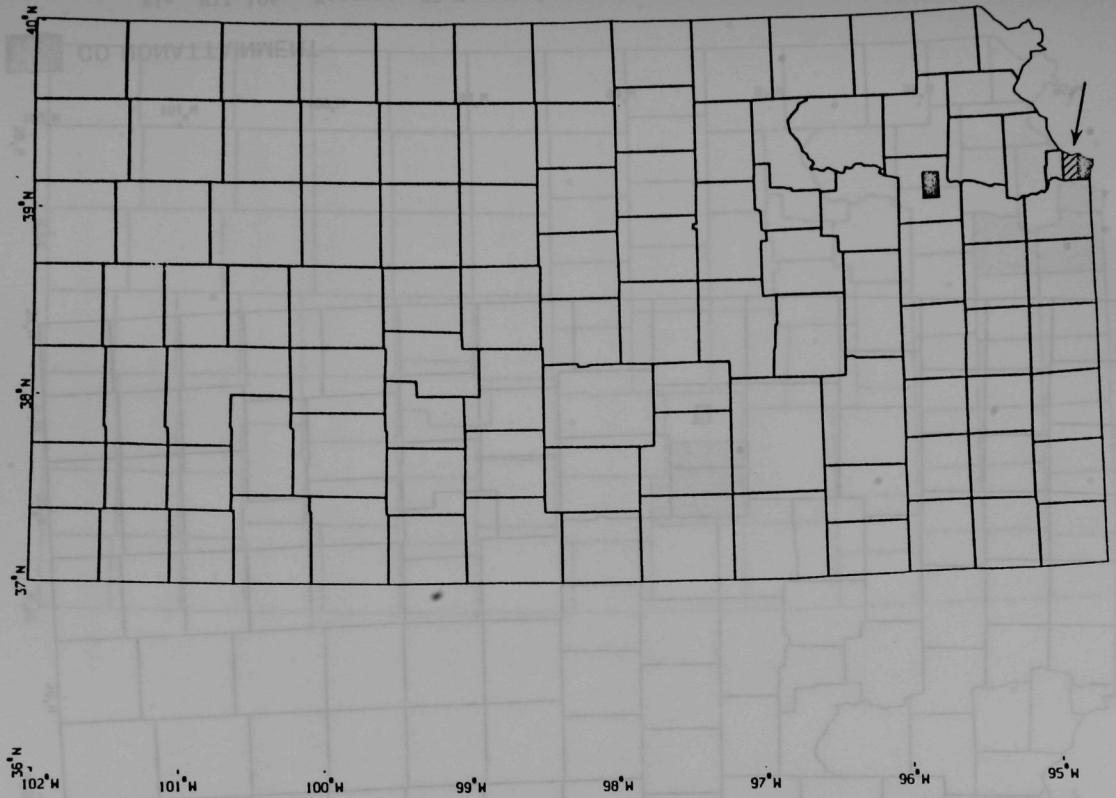
1. Sources with heat input > 250 MM Btu/hr: 1.5 lb S/MM Btu

B. TSP

1. Sources with heat input $\leq$ 10 MM Btu/hr: 0.6 lb PM/ MM Btu

2. Sources with heat input $\geq$ 10,000 MM Btu/hr: 0.12 PM/ MM Btu

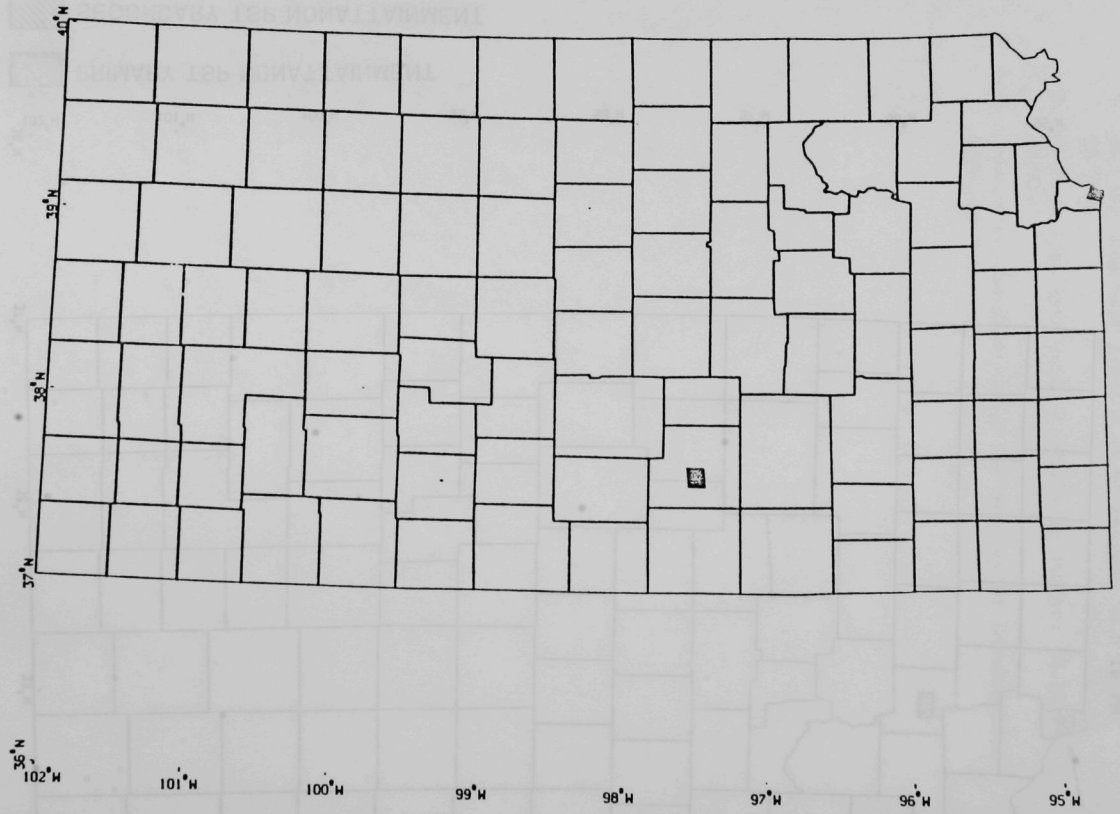
3. Interpolate between limits for sources of intermediate capacity



PRIMARY TSP NONATTAINMENT

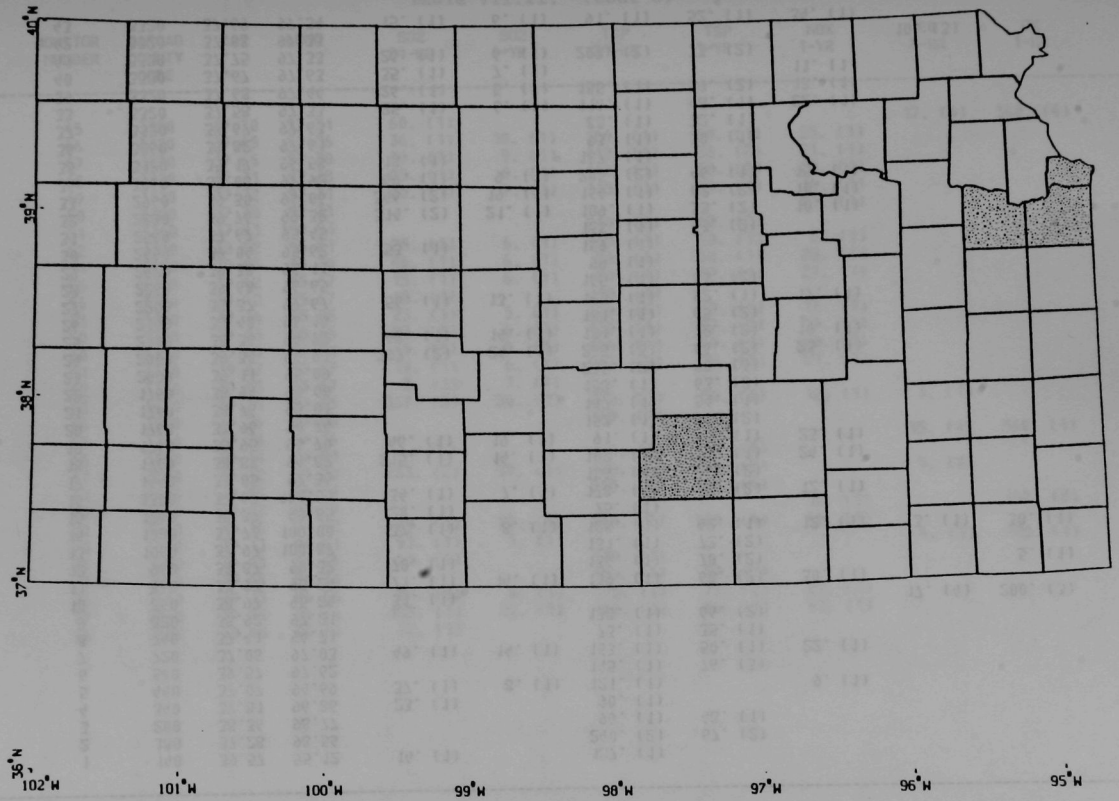
SECONDARY TSP NONATTAINMENT

Fig. VII.105. Kansas: TSP Nonattainment Areas as Designated May 1979



CO NONATTAINMENT

Fig. VII.106. Kansas: CO Nonattainment Areas as Designated May 1979



O_X NONATTAINMENT

Fig. VII.107. Kansas: O_X Nonattainment Areas as Designated May 1979

Table VII.22. Kansas: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	140	39.57	95.12	14. (1)		187. (1)				
2	180	37.28	98.56			240. (2)	67. (2)			
3	200	38.36	98.77			96. (1)	43. (1)			
4	340	37.81	96.86	23. (1)		90. (1)				
5	440	37.07	94.69	37. (1)	8. (1)	121. (1)		9. (1)		
6	560	39.57	97.62			145. (1)	76. (3)			
7	720	37.06	97.03	49. (1)	14. (1)	153. (1)	50. (1)	22. (1)		
8	740	37.41	94.71			73. (1)	35. (1)			
9	820	38.92	97.21			138. (1)	66. (2)			
10	860	38.97	95.24	31. (1)					17. (4)	200. (3)
11	860	38.97	95.24	71. (1)	14. (1)	119. (1)	68. (2)	30. (1)		
12	960	38.87	99.32	70. (1)		136. (1)	70. (2)			5. (1)
13	1060	37.97	100.87			131. (1)	72. (2)			
14	1080	37.73	100.00	37. (1)	8. (1)	128. (1)	42. (1)	12. (1)	3. (1)	30. (1)
15	1280	39.37	99.85	20. (1)		75. (1)				
16	1300	37.67	101.35	34. (1)	7. (1)	178. (1)	68. (2)	12. (1)		
17	1440	38.05	97.34			186. (1)	66. (2)			
18	1760	38.83	94.82	215. (1)	14. (1)	102. (1)	54. (1)	24. (1)		
19	1760	38.95	94.70	46. (1)	19. (1)	91. (1)	43. (1)	23. (1)		
20	1760	38.96	94.74			152. (1)	59. (2)			
21	1760	38.76	95.01			117. (1)	54. (1)			
22	1760	38.94	95.00			158. (1)	63. (2)			
23	2000	39.11	95.09			235. (2)	90. (3)			
24	2000	39.31	94.91	297. (2)	24. (1)	263. (3)	66. (2)	23. (1)		
25	2100	38.36	94.72	43. (1)	14. (1)	181. (1)	72. (2)	10. (1)		
26	2140	38.40	96.18			181. (1)	65. (2)			
27	2200	38.37	97.67	56. (1)	13. (1)	145. (1)	52. (1)	17. (1)		
28	2260	39.68	96.65			165. (1)	63. (2)			
29	2420	39.38	98.11			99. (1)				
30	2440	37.04	95.62	53. (1)		159. (1)				
31	2560	37.67	95.45			138. (1)	63. (2)			
32	2830	39.76	99.32	314. (2)	21. (1)	109. (1)	58. (2)	10. (1)		
33	2960	39.30	96.06	346. (2)	19. (1)	164. (1)	62. (2)	10. (1)		
34	3060	38.06	97.92	49. (1)	9. (1)	205. (2)	46. (1)	45. (1)		
35	3120	39.17	96.58	18. (1)		187. (1)				
36	3260	38.82	97.61			93. (1)	30. (1)			
37	3320	37.67	97.63			88. (1)	32. (1)			
38	3320	37.58	97.33	25. (1)	6. (1)	116. (1)	48. (1)	22. (1)		
39	3320	37.68	97.44	26. (1)	5. (1)	155. (1)	59. (2)	18. (1)		
40	3320	37.67	97.63	35. (1)	7. (1)			11. (1)		
41	3320	37.75	97.33	26. (1)	6. (1)	207. (2)	73. (2)			
42	3320	37.68	97.33						10. (3)	
43	3320	37.69	97.34	15. (1)	6. (1)	91. (1)	52. (1)	34. (1)		

Table VII.22. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
45	3320	37.70	97.31	60. (1)					17. (4)	360. (4)
46	3320	37.65	97.36	36. (1)	10. (1)	106. (1)	50. (1)	25. (1)		
47	3320	37.66	97.30	39. (1)	9. (1)	110. (1)	53. (2)	21. (1)		
48	3320	37.71	97.38	25. (1)	6. (1)	118. (1)	58. (2)	28. (1)		
49	3320	37.72	97.31	36. (1)	7. (1)	118. (1)	51. (1)	14. (1)		
50	3320	37.75	97.33					21. (1)		
51	3340	37.03	100.93			214. (2)	62. (2)			
52	3380	38.92	95.81	25. (1)	6. (1)	149. (1)	40. (1)	6. (1)		
54	3330	39.05	95.70	46. (1)	6. (1)	93. (1)	50. (1)	25. (1)		
55	3330	39.42	95.67	15. (1)	6. (1)	93. (1)	47. (1)	27. (1)		
56	3330	39.42	95.67	18. (1)		110. (1)				
58	3330	39.14	95.95	23. (1)	5. (1)	394. (4)	42. (1)	10. (1)		
59	3380	39.03	95.68	23. (1)	6. (1)	136. (1)	57. (2)	17. (1)		
60	3380	39.00	95.71	46. (1)	8. (1)	104. (1)	49. (1)	20. (1)		
61	3380	39.07	95.67	19. (1)	6. (1)	203. (2)	79. (3)	21. (1)		
62	3380	39.05	95.67	3. (1)	3. (1)					
63	3420	39.34	101.65	367. (3)	20. (1)	278. (3)	84. (3)	12. (1)	3. (1)	
64	3520	37.26	97.40			150. (1)				
65	3760	37.70	97.36						15. (4)	560. (4)
66	3840	39.14	94.89			160. (1)	52. (1)			
67 *	3840	39.12	94.29	283. (2)	39. (1)	170. (1)	73. (2)		9. (2)	
68	3840	39.08	94.64			245. (2)	110. (4)			
70 *	3840	39.12	94.29					30. (1)		150. (2)
71	3840	39.15	94.62	99. (1)	27. (1)	216. (2)	108. (4)	46. (1)		
73	3840	39.13	94.61	93. (1)	5. (1)				4. (1)	100. (1)
74	3840	39.08	94.64	23. (1)		119. (1)				
75 *	3840	39.44	94.71			109. (1)	57. (2)			
76	3840	39.13	94.66	21. (1)	5. (1)	195. (1)	72. (2)	29. (1)		
77	3840	39.08	94.64	158. (1)	29. (1)	139. (1)	86. (3)	43. (1)		
78	3840	39.08	94.64	22. (1)						

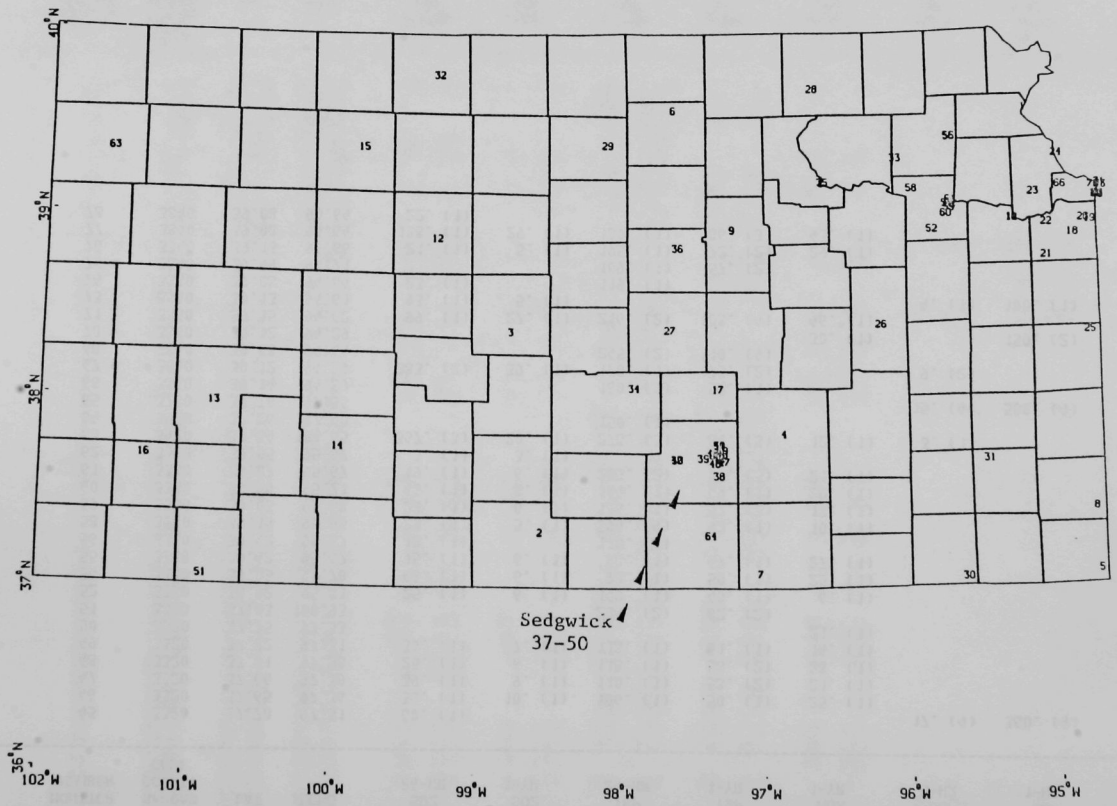


Fig. VII.108. Kansas: Locations of SAROAD Monitors
(See Table VII.22 for Monitor Numbers)

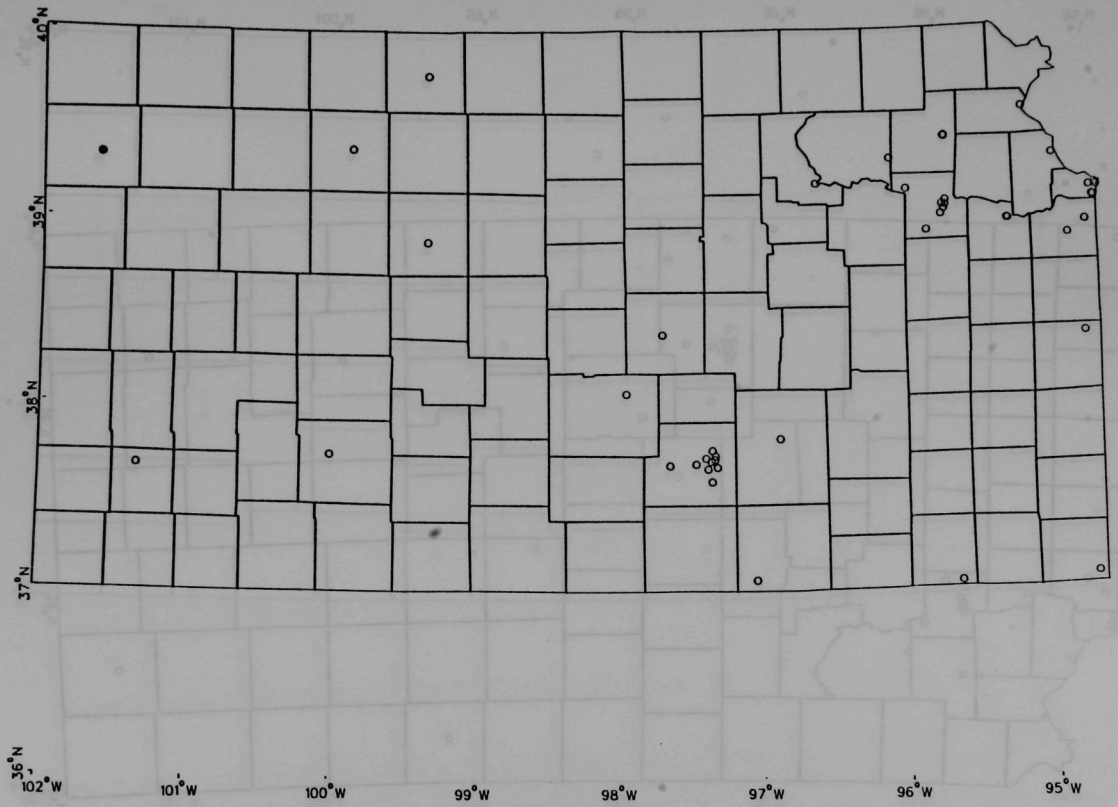


Fig. VII.109. Kansas: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

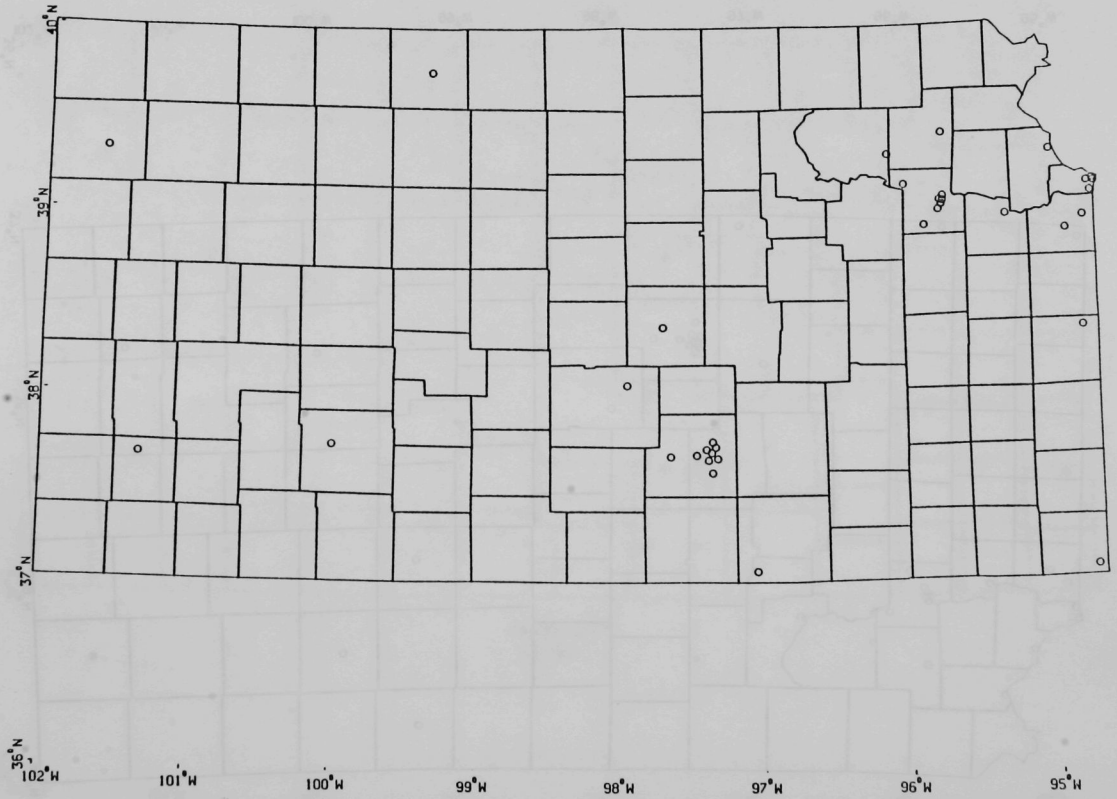


Fig. VII.110. Kansas: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

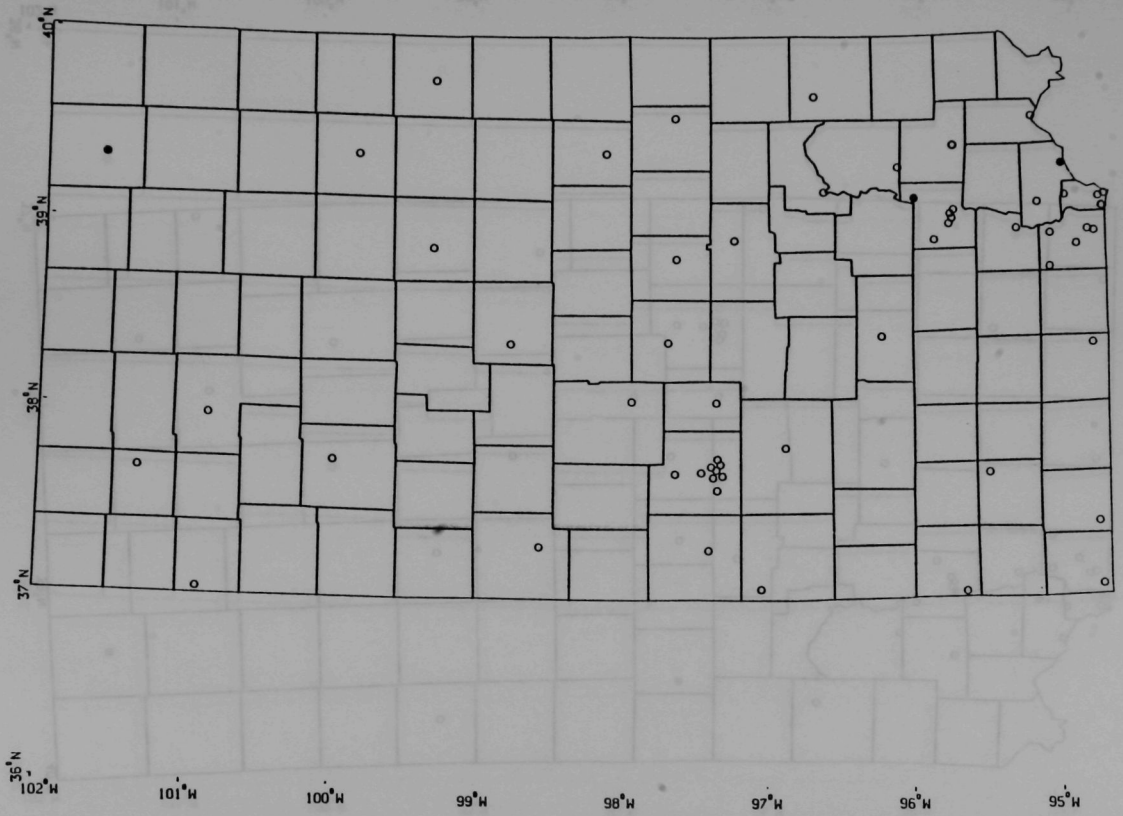


Fig. VII.111. Kansas: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

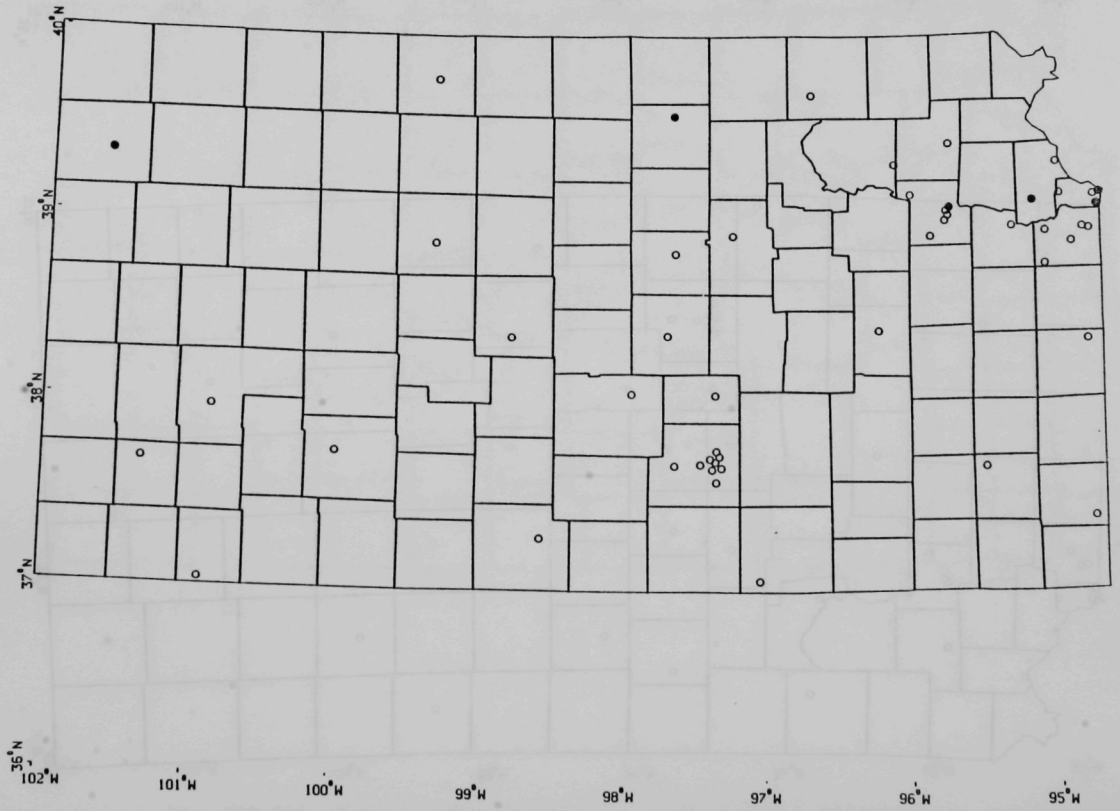


Fig. VII.112. Kansas: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

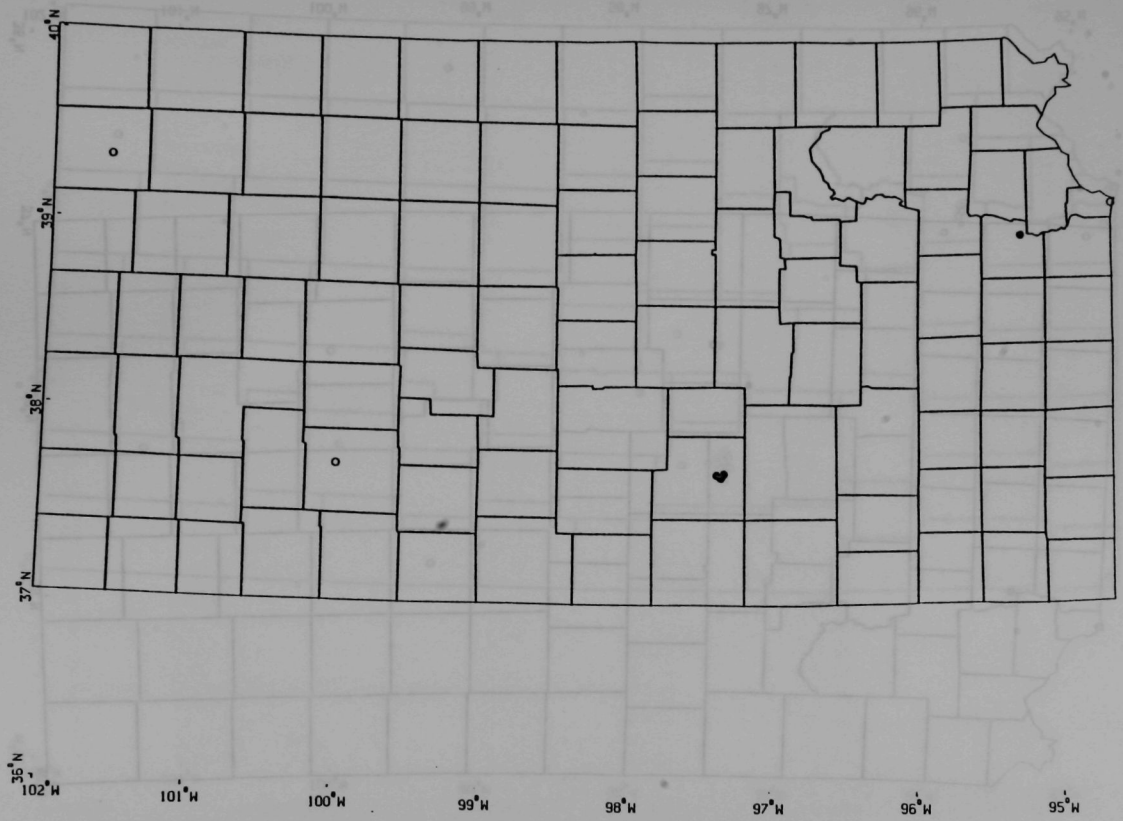


Fig. VII.113. Kansas: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

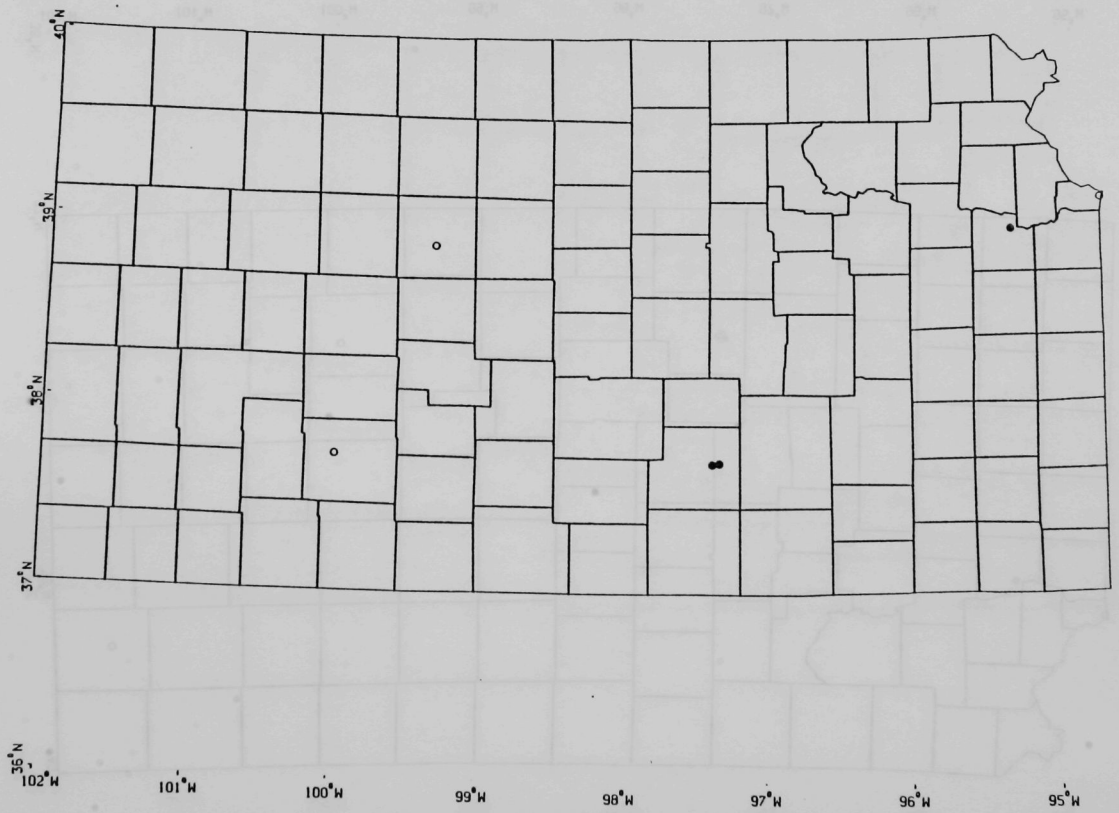


Fig. VII.114. Kansas: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

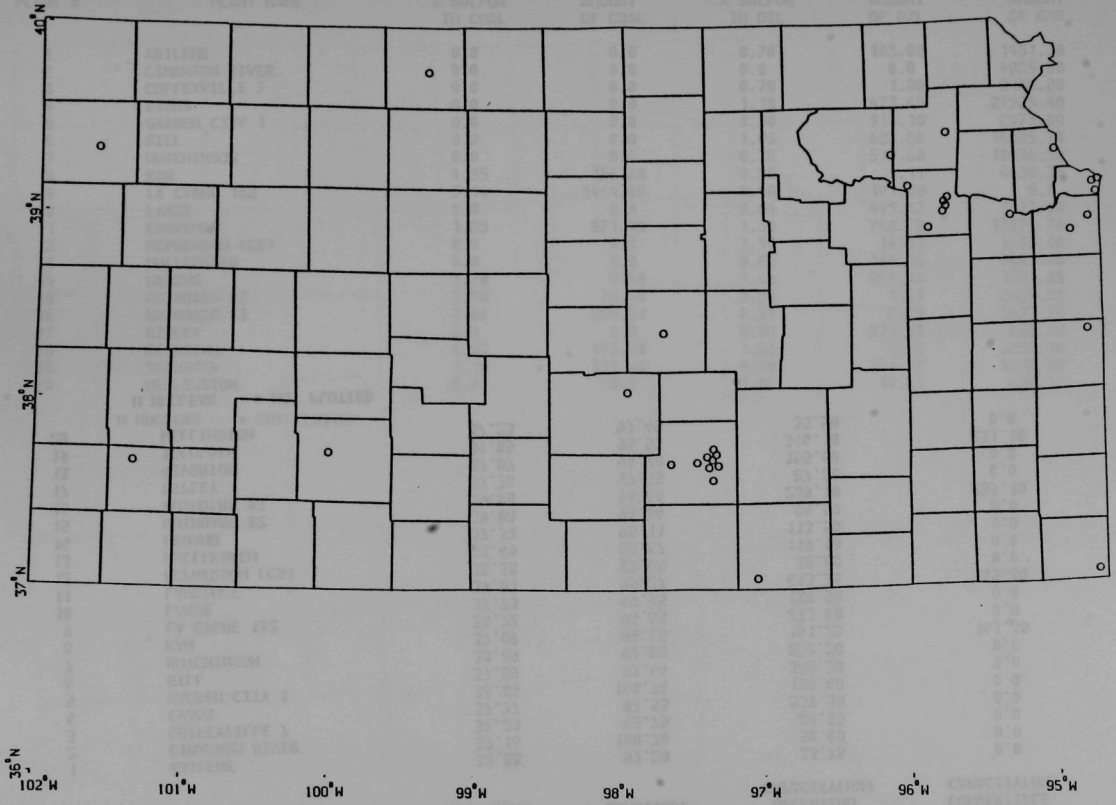


Fig. VII.115. Kansas: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table VII.23. Kansas: Power Plant Data

PLANT #	PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1	ABILENE	38.88	97.20	33.75	0.0
2	CIMARRON RIVER	37.16	100.76	50.00	0.0
3	COFFEYVILLE 7	37.20	95.75	80.05	0.0
4	EVANS	37.77	97.53	539.30	0.0
5	GARDEN CITY 1	38.04	100.74	120.40	0.0
6	GILL	37.59	97.44	348.30	0.0
7	HUTCHINSON	38.09	97.88	252.20	0.0
8	KAW	39.09	94.65	161.23	161.30
9	LA CYGNE 1&2	38.22	94.85	873.00	0.0
10	LARGE	37.73	99.95	179.50	0.0
11	LAWRENCE	39.01	95.27	613.35	585.20
12	MCPHERSON (CS)	38.38	97.65	52.00	0.0
13	NULLERGREN	38.40	98.87	119.10	0.0
14	NEOSHO	37.30	95.11	113.50	0.0
15	QUINDARO #2	39.08	94.64	94.50	0.0
16	QUINDARO #3	39.08	94.64	239.10	239.10
17	RIPLEY	37.76	97.35	87.20	0.0
18	RIVERTON	37.07	94.70	155.00	0.0
19	TECUMSEH	39.05	95.57	346.10	231.10
20	WELLINGTON	37.23	97.49	33.50	0.0

N NUCLEAR * NOT PLOTTED

Table VII.24. Kansas: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	ABILENE	0.0	0.0	0.70	103.00	1451.30
2	CIMARRON RIVER	0.0	0.0	0.0	0.0	4085.00
3	COFFEYVILLE 7	0.0	0.0	0.70	1.00	2178.00
4	EVANS	0.0	0.0	1.10	473.40	27575.40
5	GARDEN CITY 1	0.0	0.0	0.30	913.10	2973.00
6	GILL	0.0	0.0	1.00	623.80	14025.70
7	HUTCHINSON	0.0	0.0	0.70	518.60	10036.50
8	KAW	4.55	156.68	0.50	1.11	4456.34
9	LA CYGNE 1&2	5.14	1444.00	0.40	101.00	0.0
10	LARSE	0.0	0.0	0.64	495.42	3417.00
11	LAWRENCE	1.25	571.90	1.30	748.70	13074.70
12	MCPHERSON (CS)	0.0	0.0	1.50	14.83	1698.40
13	MULLERGREN	0.0	0.0	0.85	164.86	6031.00
14	NEOSHO	1.70	0.60	1.40	244.10	1321.00
15	QUINDARO #2	3.98	33.64	0.50	1.89	2625.88
16	QUINDARO #3	2.66	294.99	0.50	0.29	2611.29
17	RIPLEY	0.0	0.0	0.90	273.60	822.20
18	RIVERTON	4.01	143.55	1.63	5.53	3255.10
19	TECUMSEH	1.10	331.60	0.90	331.30	5378.20
20	WELLINGTON	0.0	0.0	0.02	14.85	679.59

N NUCLEAR * NOT PLOTTED

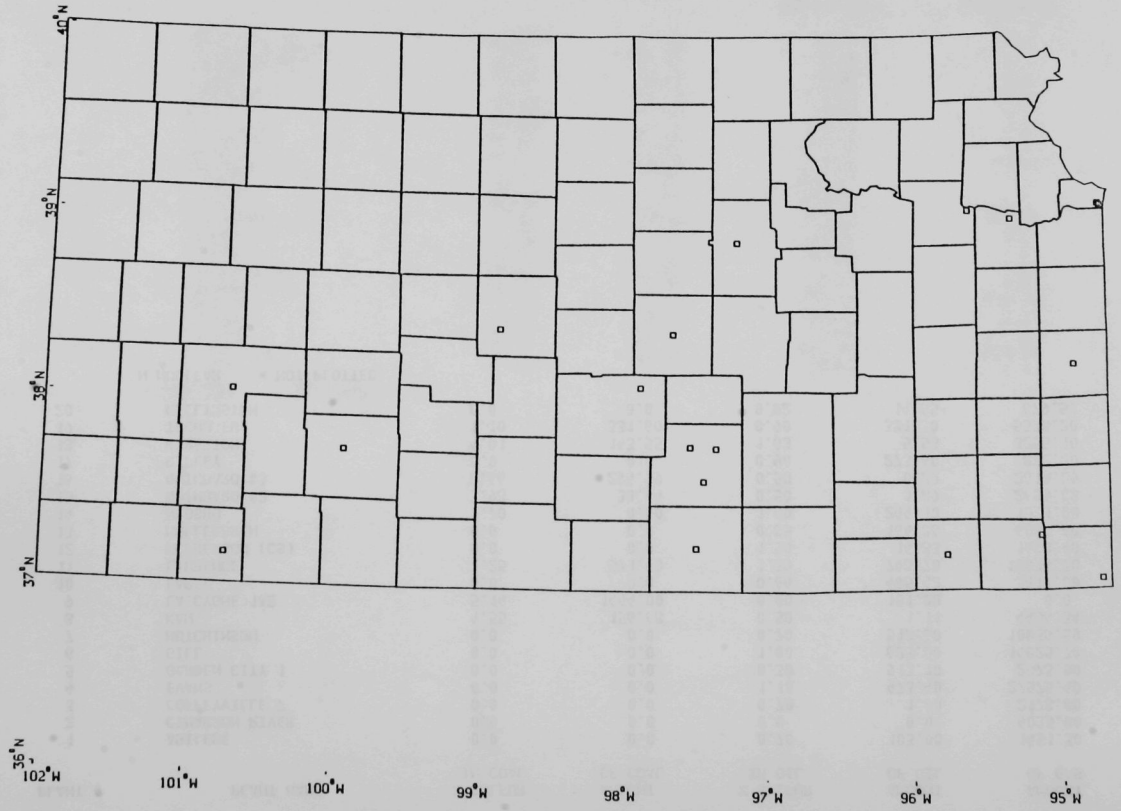


Fig. VII 116. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

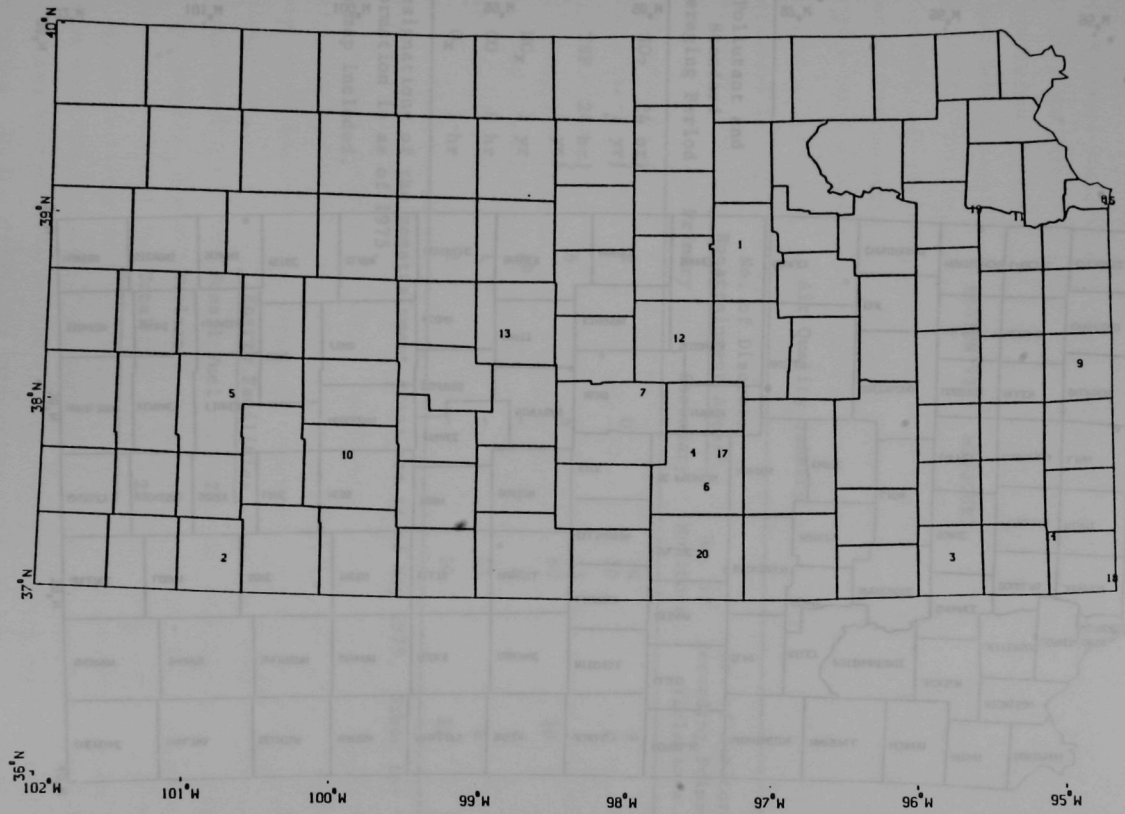


Fig. VII.117. Power Plant Key (See Tables VII.23 and VII.24 for Identification and Fuel Use Data)

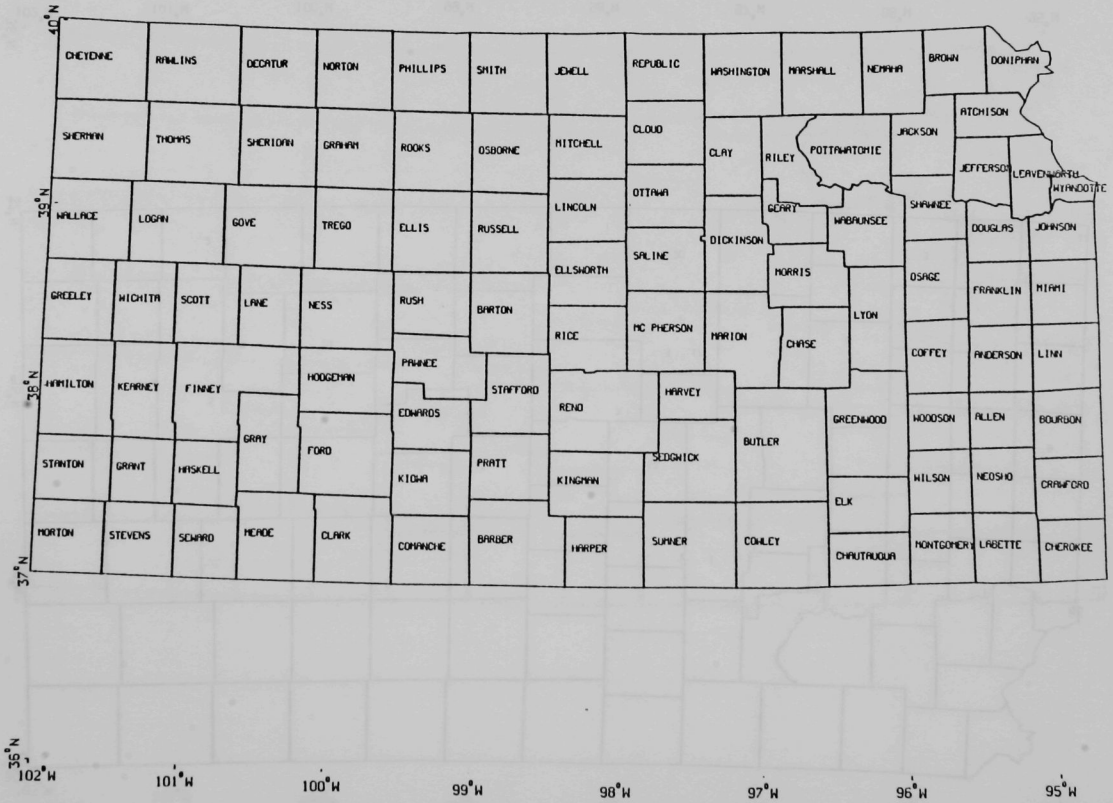


Fig. VII.118. Kansas: Key to Counties

REGION VII: MISSOURI

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a] Primary	Secondary	No. of Monitors	No. of Monitors Recording Primary Violations
SO_2	24 hr	2	0	26	9
	1 yr			10	0
TSP	24 hr	6	5	73	5
	1 yr			60	18
NO_x	1 yr	0[b]	-	8	0
CO	8 hr	1	-	13	6
O_x	1 hr	2	-	14	12

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	22
Nuclear	0
Total	22

MISSOURI (Official SIP, 6/79)

I. SOURCES OF THE PROBLEM

Missouri designated two small areas as in nonattainment for SO_2 -- St. Louis City and Bixby, in Iron County. In the St. Louis "hot spot" (located at the confluence of the River Des Peres and the Mississippi River), 90% of the SO_2 problem is attributed to emission sources at N.L. Industries' Titanium oxide plant. The plant's sources included coal-fired boilers, two sulfuric acid plants, and the calciners. The plant was shut down in May 1978 and the SIP notes that no violations have been recorded since that date. Bixby is the site of a large primary metals facility, currently out of compliance.

The state has designated six areas as in nonattainment for the primary TSP standard and six other areas for the secondary standard. A portion of the center of St. Louis has recorded primary violations, with the remainder of the city and a small additional area bordering the city recording violations of the secondary standard. A portion of Kansas City was designated in violation of the primary standards, as were the entire cities of St. Joseph (Buchanan Co.), Kirksville (Adair Co.), Mexico (Audrain Co.) and New Madrid (New Madrid Co.). Secondary areas include a one-mile area in St. Ann (west of St. Louis), Herculaneum (Jefferson Co.), Columbia City (Boone Co.) and all the rest of Kansas City AQCR #094.

In the city of St. Louis, 19% of particulate emissions are from major point sources, and 80% are from area sources including residential and commercial fuel combustion, small industries, resuspended road dust, and construction activity. The Chambers area just outside of St. Louis is affected by Missouri-Portland Cement Co. emissions, whereas St. Ann emissions are mainly fugitive dust. (St. Ann is 98% residential, with limited small commercial business.) There is some contribution of emissions from Illinois (East St. Louis). According to 1976 estimates for Kansas City, two thirds of particulate emissions resulted from point sources, with out-of-compliance power plants providing over 50% of that amount. Area sources provided the remaining one-third of particulate emissions. In the city of Columbia, 97% of emissions are from area sources such as wind blown dust from unpaved roads and rock quarries. In St. Joseph, the main sources of particulates are industrial processes and unpaved roads; in New Madrid, a power plant and unpaved roads;

in Mexico, industrial coal combustion, mineral processing, and unpaved roads; in Herculaneum, industrial coal combustion and unpaved roads, and in Kirksville, unpaved roads and resuspended dust.

Kansas City and St. Louis are in nonattainment for ozone. In metropolitan Kansas City, approximately 39% of the uncontrolled volatile organic compounds (VOC) come from stationary sources (gasoline service station loading and unloading, fugitive emissions from refineries, miscellaneous industrial processing). Approximately 54% of VOCs can be linked to mobile source (vehicle) emissions and the remainder to dry-cleaning solvent use and other dispersed minor sources. In St. Louis the percentage breakdown is similar for stationary sources (30%), motor vehicles (50%) and small sources such as dry cleaners (20%).

St. Louis is the only area in nonattainment for CO, with violations due to vehicle emissions. There are no NO_x nonattainment areas in Missouri.

II. ATTAINMENT STRATEGIES

A. SO_2

1. St. Louis Hotspot

a. SO_2 emissions limitations for sulfuric acid plant (500 ppm), coal-fired boilers (1.8 lb SO_2/MM Btu), and calciners (100 ppm) at NL Industries should operations start up again

- limit on boilers would require a switch from coal to oil

b. NL shut down titanium oxide plant in May 1978

- area has been in attainment since the shutdown

2. Bixby

a. To attain compliance with emissions limitations

B. TSP

1. St. Louis

a. Bring remaining out-of-compliance point sources into compliance with regulations

- current regulations are RACT
- Great Lakes Carbon Co. plant to be in compliance by 1980

- NL Industries are already shut down
- boiler controls to be instituted for Washington University
- shut down two city incinerators (to be replaced by a resource recovery plant)
- 1.2:1 ratio set for emissions offset
- no growth allowance possible

b. The state requests an extension of the deadline to submit plan to attain secondary standards and develop fugitive dust controls

- regulate construction practices
- improve street cleaning
- pave parking lots
- suppress truck and railroad yard spillage
- modify street sanding during the winter
- control industrial fugitive process emissions

c. Cleanup of sources in St. Louis County and Illinois

2. St. Louis (includes Chambers, St. Ann)

a. RACT already required on Missouri - Portland Cement Co.

- new ESPs
- more visits to site to achieve compliance
- opacity requirements reduced from 40% to 20%

b. Shut down of Certain-Teed Products Co.

c. Parking-lot paving and study of other fugitive dust measures (St. Ann)

3. Kansas City

a. RACT for major stationary sources

- existing SIP requires RACT
- compliance to be required
- better maintenance of scrubbers on Kansas City Power & Light Hawthorne Unit
- primary attainment projected by deadline

b. Secondary standard attainment

- fugitive dust controls at specific projected TSP "hotspots" (improved street cleaning, covering storage piles)
- federal program to use unleaded fuel reduces vehicle particulates
- Federal Fuel Economy for vehicles reduces tire fragments through use of lighter vehicles
- VOC emissions reductions cut aerosol formation
- the state requests extension of the deadline for a plan to attain secondary standards

4. Other TSP nonattainment areas

   a. Not available

C. O_x

1. Kansas City

   a. RACT (using the EPA's control guidance techniques) for 12 VOC source categories

   b. Federal Motor Vehicle Emissions Control Program

   c. Should attain 0.12 ppm standard by Dec. 31, 1982

2. St. Louis

   a. FMVECP

   b. Inspection and maintenance of motor vehicles

   c. RACT for major stationary sources with largest reductions from

      - service station loading
      - organic chemical manufacture
      - automobile surface coating
      - graphic arts

   d. Reasonably Available Transportation Controls Measures

      - improved mass transit
      - exclusive bus/carpool lanes
      - area-wide carpooling
      - parking controls
      - park-and-ride
      - staggered work hours
      - traffic flow improvements

D. CO

1. FMVECP
2. Inspection and maintenance of motor vehicles
3. Transportation control measures for ozone
4. Reductions of stationary source emissions at Monsanto plant
5. Increase number of vans for vanpooling

III. NEW SOURCE REVIEW

Missouri plans to use both growth allowances and emissions offsets. Growth allowances will be used for major sources of VOC in St. Louis and Kansas City, with an offset program as a back-up, should the allowances be exceeded. New sources of PM in nonattainment areas will be expected to obtain binding commitments for reduced emissions from existing sources to offset new emissions. In St. Louis the offset ratio is 1.2 tons from existing sources to 1 ton of new source emissions.

IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. St. Louis major metropolitan area

   a. Sources with heat input > 2,000 MM Btu/hr: 2.3 lb SO_2/MM Btu

   b. Sources with heat input < 2,000 MM Btu/hr: limited to fuel with 2% sulfur content

   c. Exceptions:

      - Union Electric Co. Labadie Plant: 6.2 lb SO_2/MM Btu until 12/31/81, when emission limit of 4.8 lb SO_2/MM Btu is to be met
      - Union Electric Co. Portage des Sioux: 4.8 lb SO_2/MM Btu

2. Kansas City Major Metropolitan Area

   a. Sources with heat input > 350 MM Btu/hr: 8.0 lb SO_2/MM Btu

   b. Exceptions:

      - Independence Power and Light: 6.3 lb SO_2/MM Btu

- Kansas City Power and Light Grand Ave. Plant: 9.0 lb SO_2/MM Btu
- K.C. P.L. Hawthorne Plant: 6.1 lb SO_2/MM Btu
- Missouri PSC Sibley Plant: 9.0 lb SO_2/MM Btu
- St. Joseph Power and Light: 8.6 lb SO_2/MM Btu

3. Rest of State

   a. Sources with heat input > 350 MM Btu/hr: 8.0 lb SO_2/MM Btu

B. TSP

1. St. Louis

   a. Sources with heat input < 10 MM Btu/hr: 0.60 lb PM/MM Btu

   b. Sources with heat input > 5,000 MM Btu/hr: 0.13 lb PM

   c. For sources with intermediate capacities, interpolate between the above limits

   d. Revisions to previous limits of 0.6 lb PM/MM Btu for < 10 MM Btu heat input and 0.18 lb PM/MM Btu for > 10,000 MM Btu heat input with a stack height allowance

2. Kansas City Major Metropolitan area

   a. Sources with heat input < 10 MM Btu/hr: 0.4 lb PM/MM Btu

   b. Sources with heat input > 1,000 MM Btu/hr: 0.1 (interpolate between sizes)

   c. Interpolate between the above limits for sources of intermediate capacities

   d. Revisions of previous limits of 0.6 lb PM/MM Btu for < 10 MM Btu/hr heat input and 0.12 lb PM/MM Btu for > 10,000 MM Btu/hr heat input

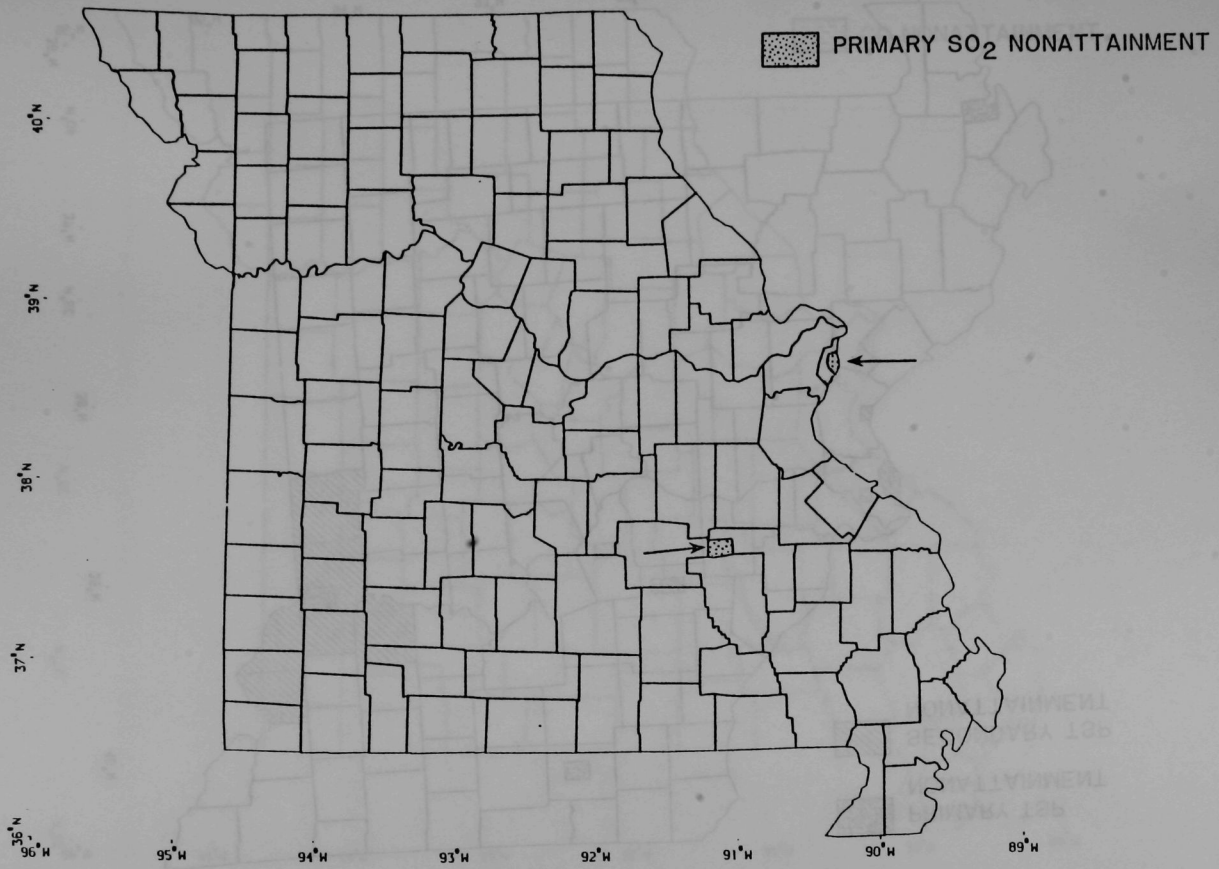


Fig. VII.119. Missouri: SO_2 Nonattainment Areas as Designated May 1979

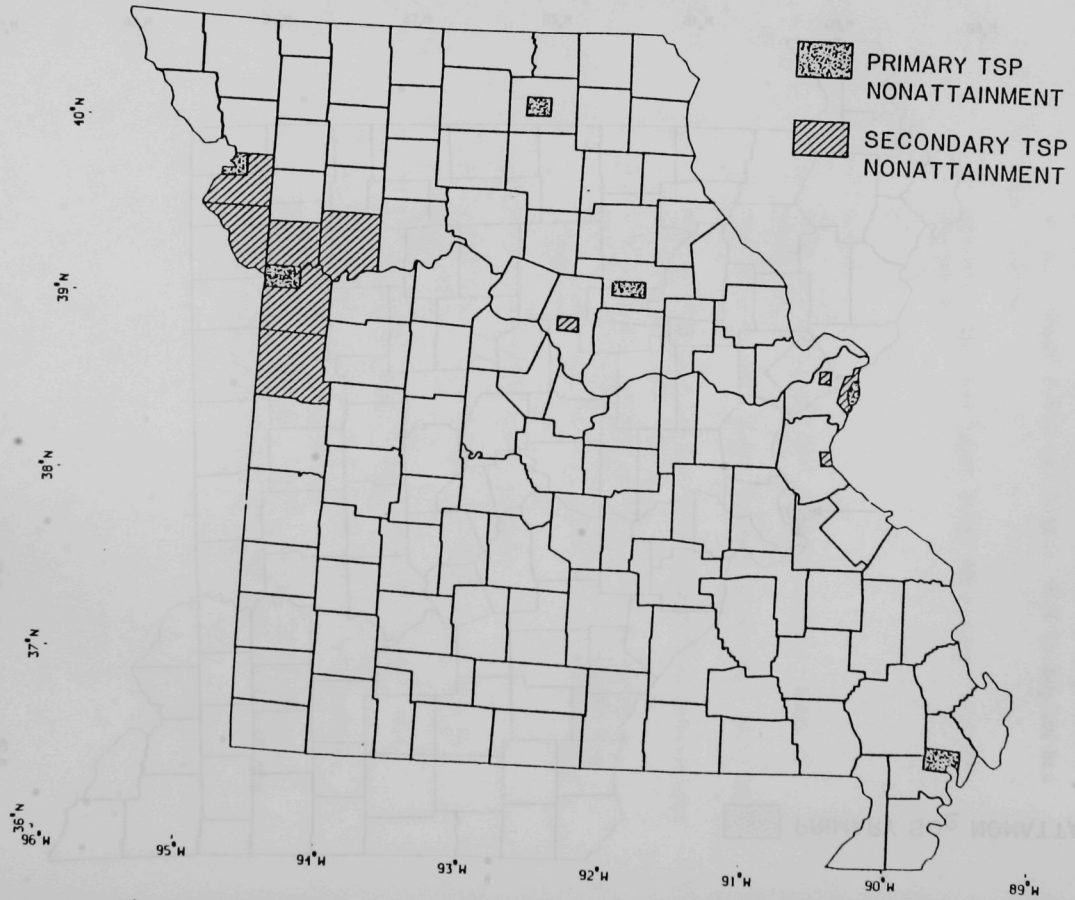


Fig. VII.120. Missouri: TSP Nonattainment Areas as Designated May 1979

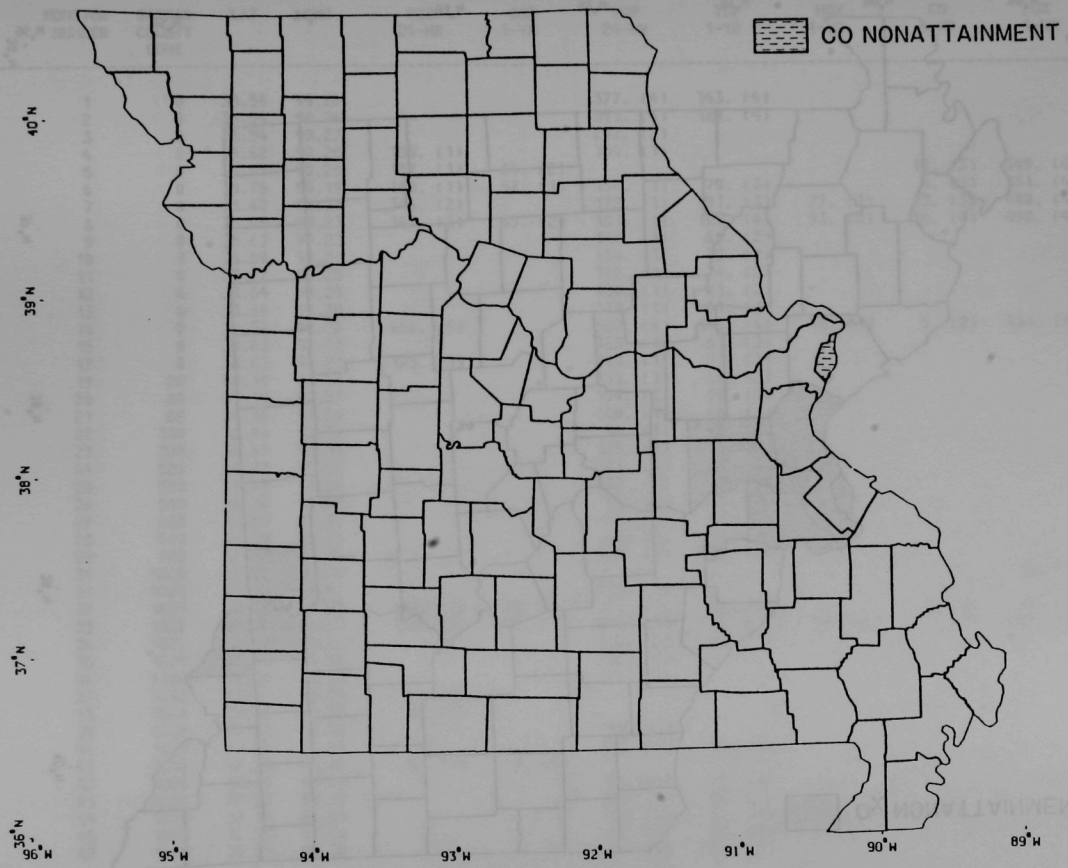


Fig. VII.121. Missouri: CO Nonattainment Areas as Designated May 1979

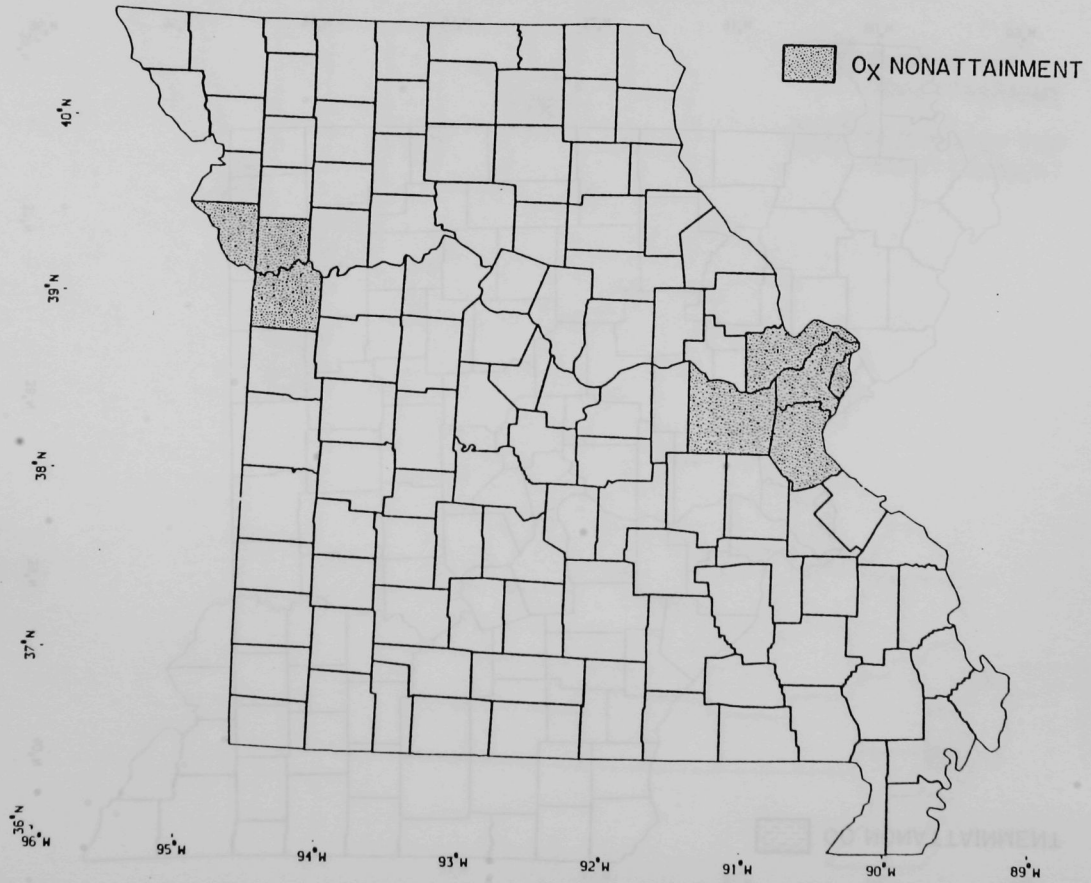


Fig. VII.122. Missouri: O_X Nonattainment Areas as Designated May 1979

Table VII.25. Missouri: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	0	38.54	90.26			377. (4)	143. (4)			
2	0	38.54	90.26			391. (4)	121. (4)			
3	0	38.54	90.27			242. (2)				
4	0	38.62	90.20	134. (1)		154. (1)				
5	0	38.63	90.20	187. (1)	64. (2)				11. (3)	549. (4)
6	0	38.75	90.19	180. (1)	57. (1)	150. (1)	79. (3)		4. (1)	351. (4)
7	0	38.62	90.28	346. (2)		172. (1)	91. (3)	27. (1)	12. (3)	490. (4)
8	0	38.68	90.23	397. (3)	69. (2)	181. (1)	105. (4)	93. (2)	18. (4)	490. (4)
9	0	38.63	90.23			117. (1)	64. (2)			
10	0	38.59	90.24			154. (1)	72. (2)			
11	0	38.67	90.28			150. (1)	74. (2)			
12	0	38.64	90.29			130. (1)	61. (2)			
13	0	38.59	90.30			112. (1)	64. (2)			
14	0	38.54	90.26	666. (4)		563. (4)	106. (4)	44. (1)	9. (2)	431. (4)
15	0	38.63	90.20			163. (1)	81. (3)			
17	0	38.63	90.21	125. (1)		195. (1)	81. (3)			
19	20	40.19	92.58			130. (1)	66. (2)			
20	80	39.17	91.87			199. (2)	90. (3)			
21	80	39.16	91.89			140. (1)	46. (1)			
22	380	38.96	92.33			94. (1)	42. (1)			
23	330	38.97	92.30			139. (1)	75. (2)			
24	520	39.77	94.85			171. (1)	81. (3)			
25	520	39.79	94.80			152. (1)	75. (2)			
26	540	36.76	90.42			93. (1)	33. (1)			
27	620	38.85	91.95			93. (1)	38. (1)			
28	640	38.00	92.75			64. (1)	35. (1)			
29	720	37.32	89.57			120. (1)	49. (1)			
30	1020	39.42	94.28							18. (1)
31	1020	39.19	94.51			134. (1)				
32	1020	39.15	94.55	164. (1)	22. (1)	187. (1)	83. (3)		4. (1)	10. (1)
33	1020	39.15	94.58	133. (1)	25. (1)	144. (1)	72. (2)	36. (1)	5. (1)	225. (4)
34	1020	39.18	94.52			128. (1)	69. (2)			
35	1020	39.11	94.59			172. (1)				
36	1100	38.59	92.22			66. (1)				
37	1860	37.13	93.25	72. (1)						
38	1860	37.18	93.38	3. (1)						
39	1860	37.22	93.28			93. (1)				
40	1860	37.25	93.33			132. (1)	42. (1)			
41	1860	37.23	93.38	16. (1)	4. (1)					
42	1860	37.20	93.31			96. (1)	51. (1)			
43	1860	37.20	93.28			119. (1)	56. (1)			
44	1860	37.18	93.33			95. (1)	44. (1)			
45	1860	37.25	93.26			79. (1)	42. (1)			
47	1860	37.24	93.30			95. (1)	55. (1)			

Table VII.25. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
48	1860	37.23	92.58			81. (1)	44. (1)			
49	2200	37.61	91.12	1292. (4)						
50	2200	37.57	90.72	64. (1)						
51	2240	39.12	94.42			125. (1)	73. (2)			
52	2240	39.09	94.42	50. (1)	10. (1)	151. (1)	81. (3)	28. (1)		
53	2240	38.89	94.54			136. (1)	64. (2)			
54	2240	39.06	94.51			144. (1)	85. (3)			
55	2240	39.06	94.51			164. (1)	78. (3)			
56	2240	39.03	94.57	10. (1)		127. (1)	65. (2)			
57	2240	39.10	94.58	49. (1)	13. (1)	163. (1)		46. (1)		
59	2240	38.96	94.58	16. (1)		141. (1)	74. (2)			
60	2240	39.10	94.50			160. (1)	84. (3)			
61	2240	39.11	94.58	183. (1)	12. (1)	238. (2)		48. (1)	8. (2)	294. (4)
62	2240	39.02	94.46			75. (1)				
63	2260	37.09	94.51			136. (1)	53. (1)			
64	2280	38.27	90.38	419. (3)		127. (1)	79. (3)			
65	2740	39.54	93.54			110. (1)				
66	2940	39.71	91.36			121. (1)	62. (2)			
67	3300	36.59	89.55			133. (1)				
68	3340	40.35	94.88			144. (1)	44. (1)			
69	3660	38.69	93.28			56. (1)				
70	3680	38.95	91.77			91. (1)	41. (1)			
71	3740	39.30	94.70			107. (1)	46. (1)			
72	3740	39.37	94.77			131. (1)	56. (1)			
73	4300	38.53	90.26			271. (3)	103. (4)			
74	4300	38.54	90.27			145. (1)	64. (2)			
75	4300	38.73	90.33	182. (1)		150. (1)	59. (2)		18. (4)	686. (4)
77	4300	38.85	90.25			113. (1)	39. (1)			
78	4300	38.61	90.50	134. (1)					10. (2)	372. (4)
79	4300	38.55	90.49			274. (3)	103. (4)			
80	4300	38.72	90.34			131. (1)	58. (2)			
81	4300	38.77	90.23	173. (1)		117. (1)	54. (1)		12. (3)	451. (4)
82	4300	38.75	90.21			143. (1)	66. (2)			
83	4300	38.34	90.34	123. (1)		103. (1)			7. (1)	372. (4)
84	4300	38.64	90.35						37. (4)	
85	4300	38.64	90.34			109. (1)	53. (2)			
86	4300	38.64	90.35	328. (2)						431. (4)
87	4440	36.89	89.53			131. (1)	43. (1)			
88	4480	37.17	91.35					9. (1)		
90	4480	37.17	91.35	27. (1)	9. (1)	55. (1)	24. (1)			

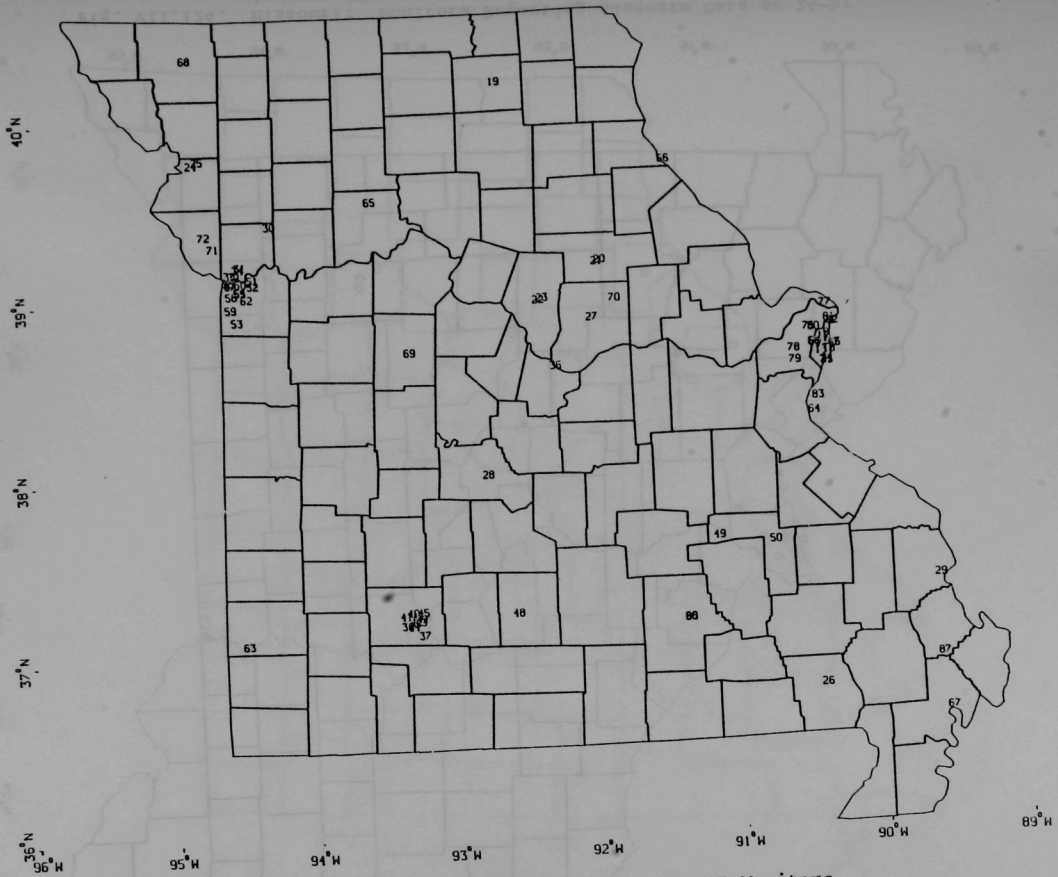


Fig. VII.123. Missouri: Locations of SAROAD Monitors
(See Table VII.25 for Monitor Numbers)

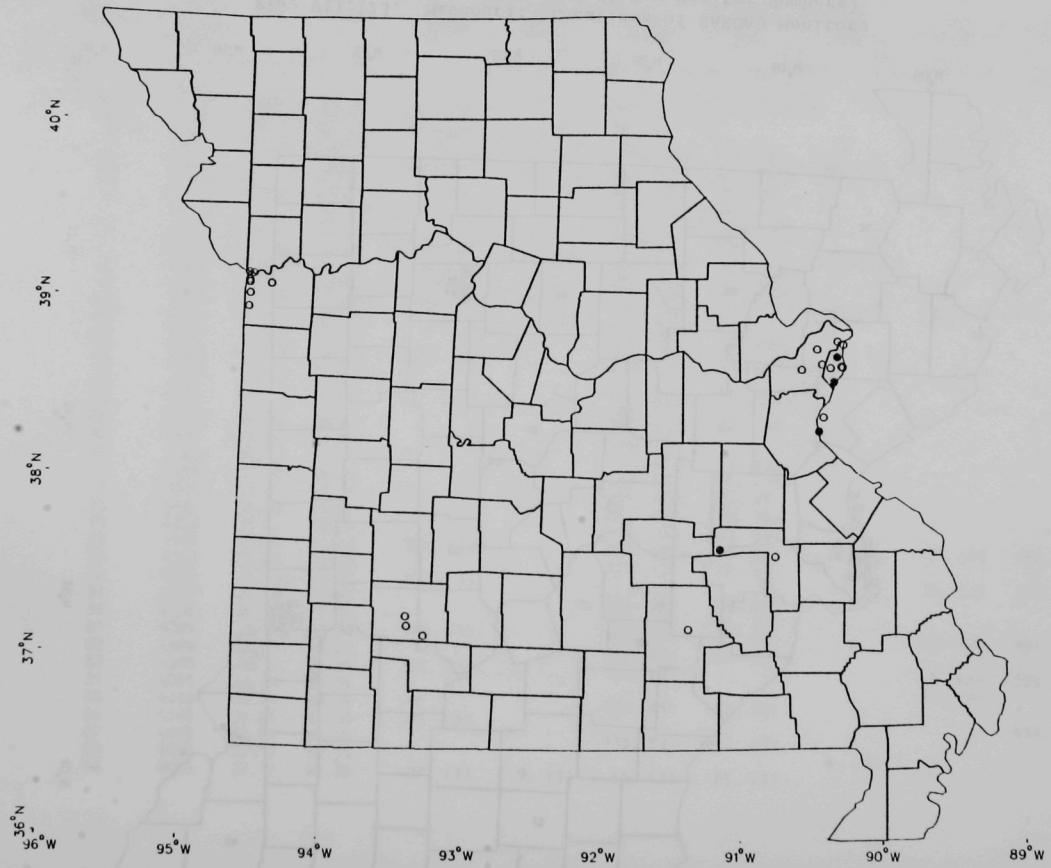


Fig. VII.124. Missouri: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

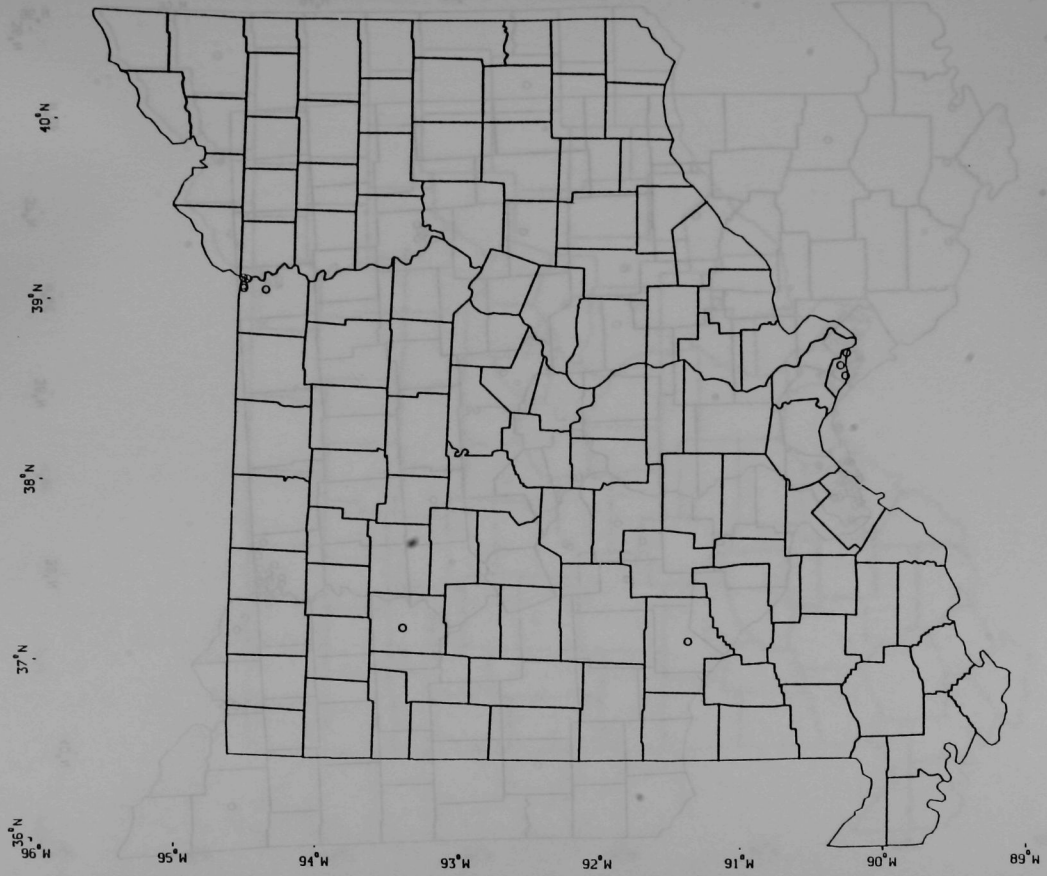


Fig. VII.125. Missouri: Monitors Reporting Adequate Data on Annual Average SO_2; No Violations

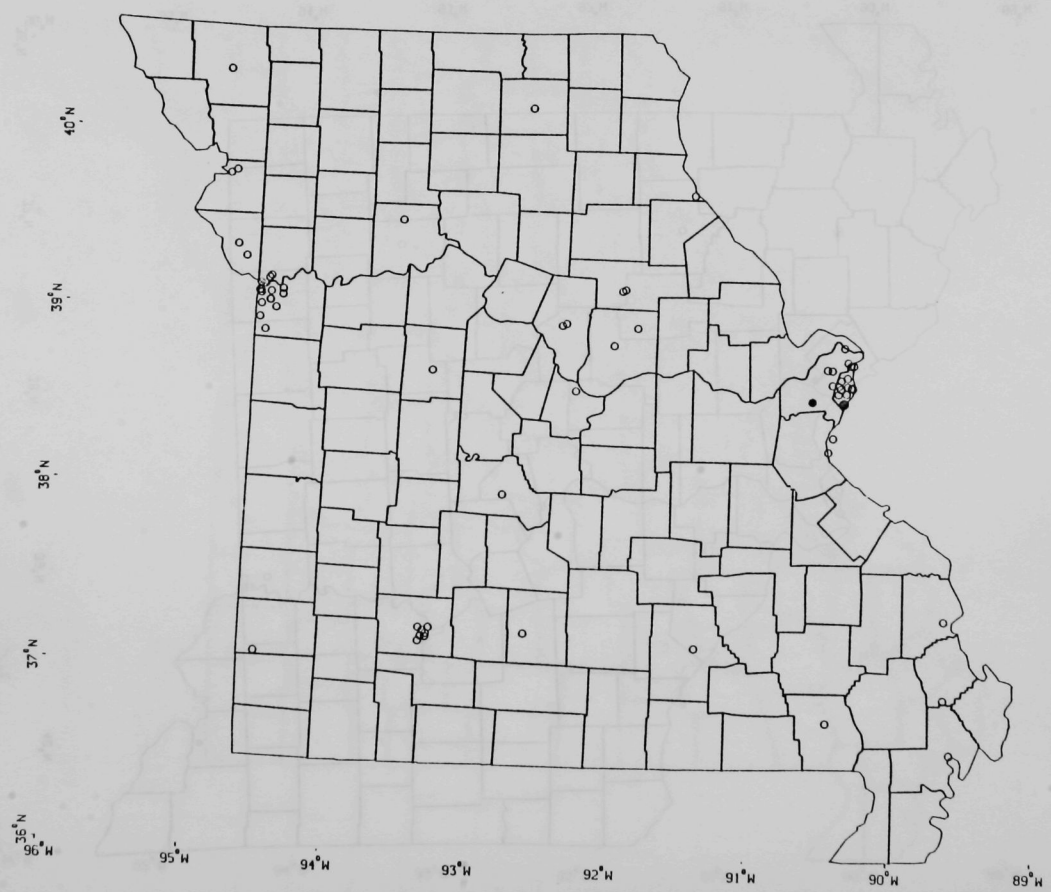


Fig. VII.126. Missouri: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

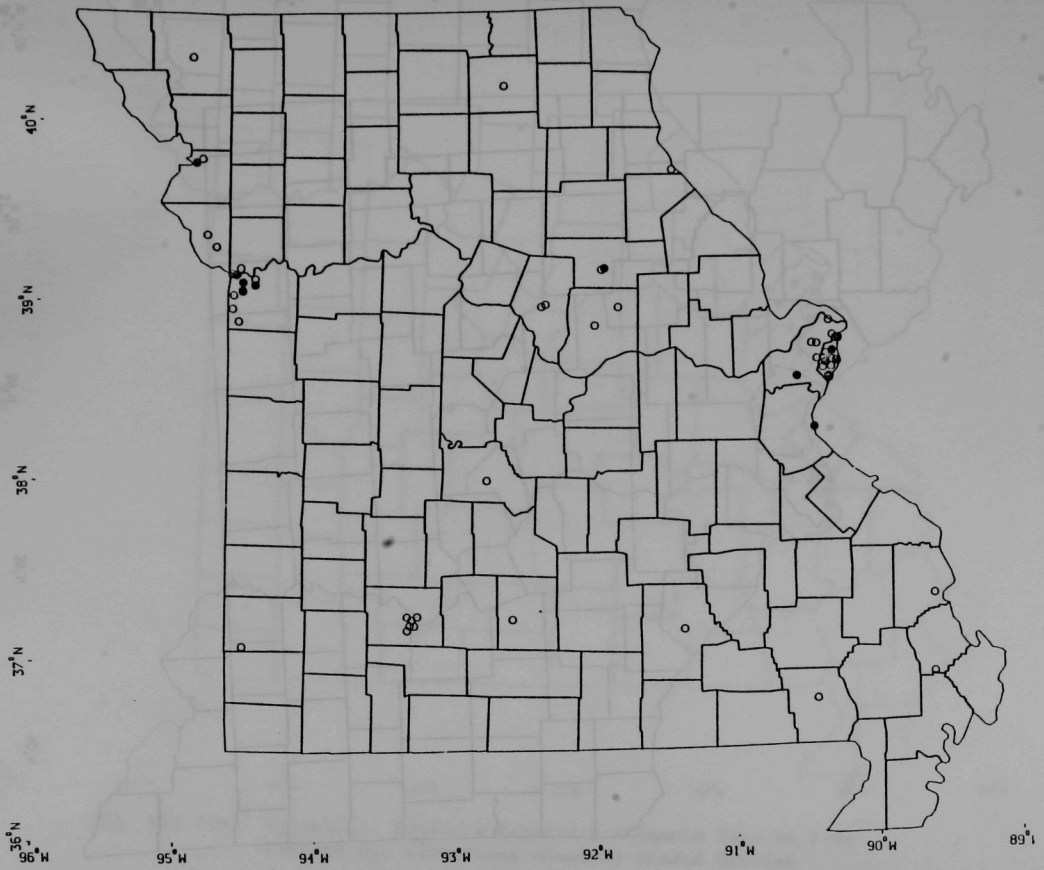


Fig. VII.127. Missouri: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

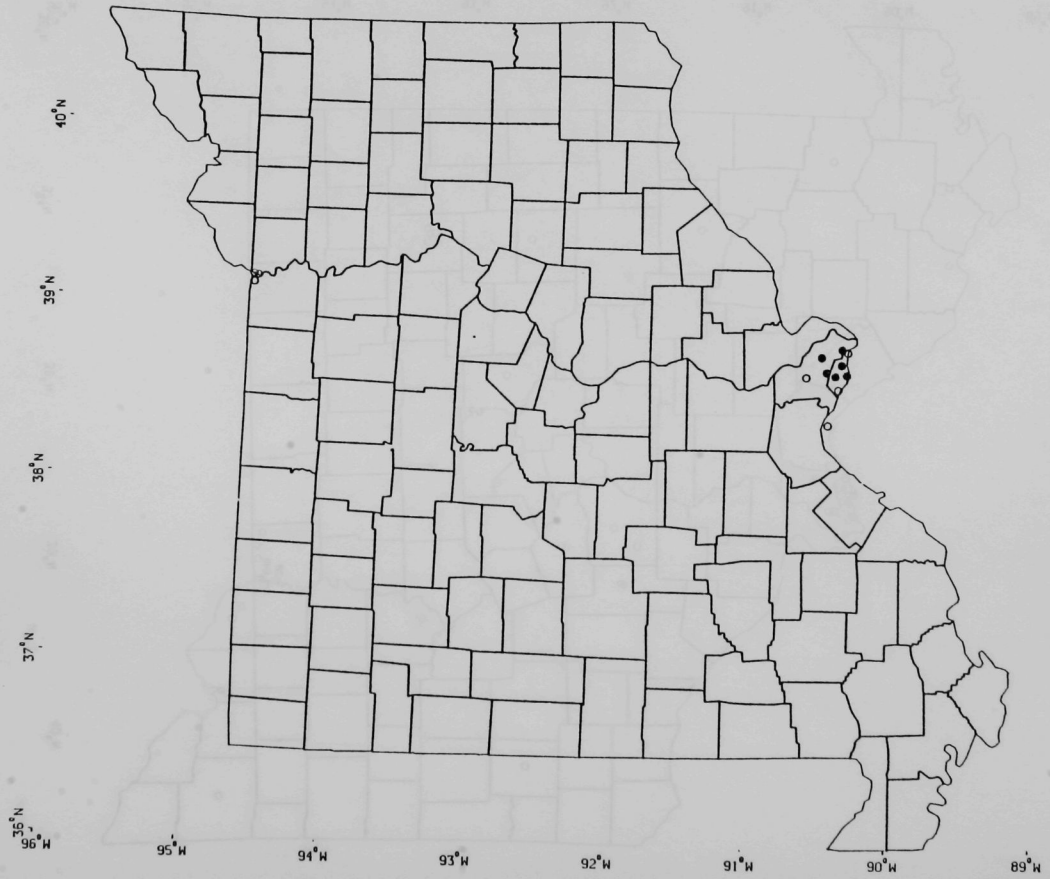


Fig. VII.128. Missouri: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

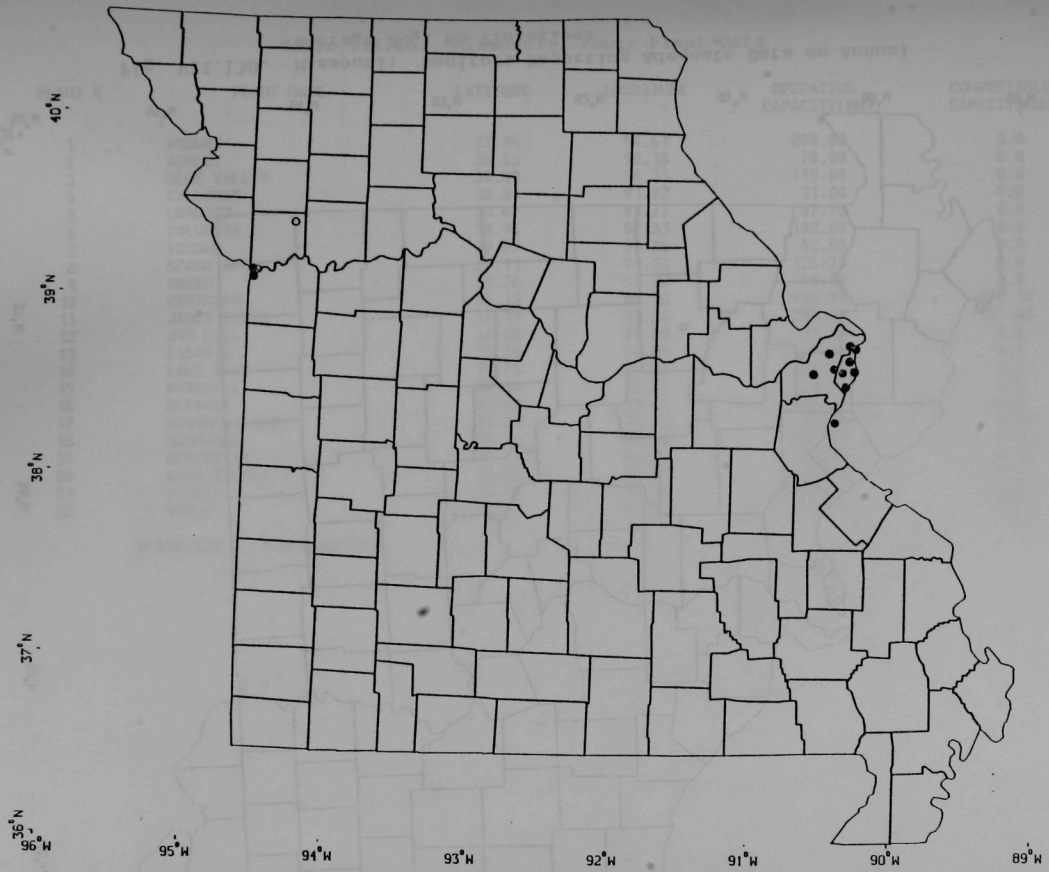


Fig. VII.129. Missouri: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

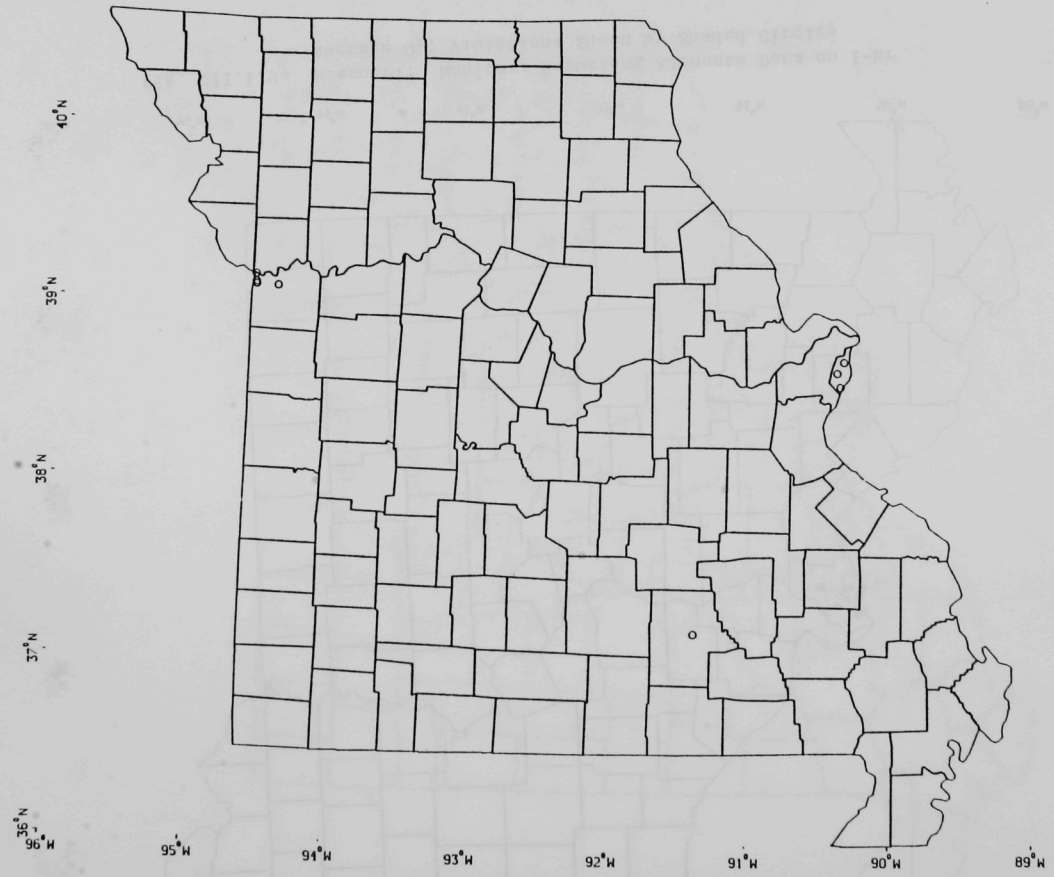


Fig. VII.130. Missouri: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table VII.26. Missouri: Power Plant Data

PLANT #	PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1	ASBURY	37.34	94.61	200.00	0.0
2	ASHLEY	38.65	90.18	70.00	0.0
3	BLUE VALLEY	39.09	94.33	115.00	0.0
4	CALLAWAY	38.84	91.92	11.00	0.0
5	CHANOIS	38.67	91.77	67.70	0.0
6	COLUMBIA	38.96	92.33	102.00	0.0
7	EDMOND	39.77	94.86	42.50	0.0
8	GRAND AVE	39.11	94.58	126.75	0.0
9	GREEN	38.78	94.27	49.50	0.0
10	HAWTHORN	39.13	94.48	903.00	770.10
11	JAMES RIVER	37.11	93.26	257.00	104.00
12	JIM HILL	36.28	90.09	33.00	0.0
13	LABADIE	38.56	90.84	2482.00	0.0
14	LAKE ROAD	39.75	94.86	150.50	0.0
15	MARSHALL	39.14	93.20	38.50	0.0
16	MERAMEC	38.40	90.34	923.04	0.0
17	MISSOURI CITY	39.23	94.31	40.00	0.0
18	MONTROSE	38.38	93.76	563.00	0.0
19	NORTHEAST	39.12	94.56	133.00	0.0
20	RUSH ISLAND 1 & 2	38.26	90.54	45.00	0.0
21	SIBLEY	39.18	94.19	513.50	0.0
22	SIOUX	38.91	90.29	1099.60	0.0

N NUCLEAR * NOT PLOTTED

Table VII.27. Missouri: Fuel Use Data

PLANT #	PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1	ASBURY	4.73	657.64	0.10	2.79	0.0
2	ASHLEY	0.0	0.0	1.85	523.80	0.0
3	BLUE VALLEY	2.01	130.70	0.12	8.20	2940.90
4	CALLAWAY	0.0	0.0	0.0	0.0	0.0
5	CHAMOIS	3.54	59.00	0.10	0.52	0.0
6	COLUMBIA	2.04	79.17	0.10	23.60	46.69
7	EDMOND	0.0	0.0	1.34	55.03	1403.65
8	GRAND AVE	3.60	174.00	0.30	69.00	732.00
9	GREEN	3.78	12.70	0.0	0.0	939.00
10	HAWTHORN	1.54	1315.00	0.30	11.00	5222.00
11	JAMES RIVER	2.74	197.33	0.0	0.0	5373.00
12	JIM HILL	0.0	0.0	1.30	13.79	0.0
13	LABADIE	2.89	5693.90	0.30	152.40	0.0
14	LAKE ROAD	3.90	124.82	1.71	35.33	5864.00
15	MARSHALL	3.50	19.39	0.10	1.92	681.60
16	MERAMEC	2.48	1945.10	0.0	0.0	17.00
17	MISSOURI CITY	3.97	18.14	0.94	2.27	0.0
18	MONTROSE	4.83	1609.00	0.30	30.00	0.0
19	NORTHEAST	0.0	0.0	0.30	5.00	762.00
20	RUSH ISLAND 1 & 2	0.0	0.0	0.0	0.0	0.0
21	SIBLEY	3.76	840.00	0.0	0.0	0.0
22	SIOUX	3.05	2104.90	0.30	14.00	0.0

N NUCLEAR * NOT PLOTTED

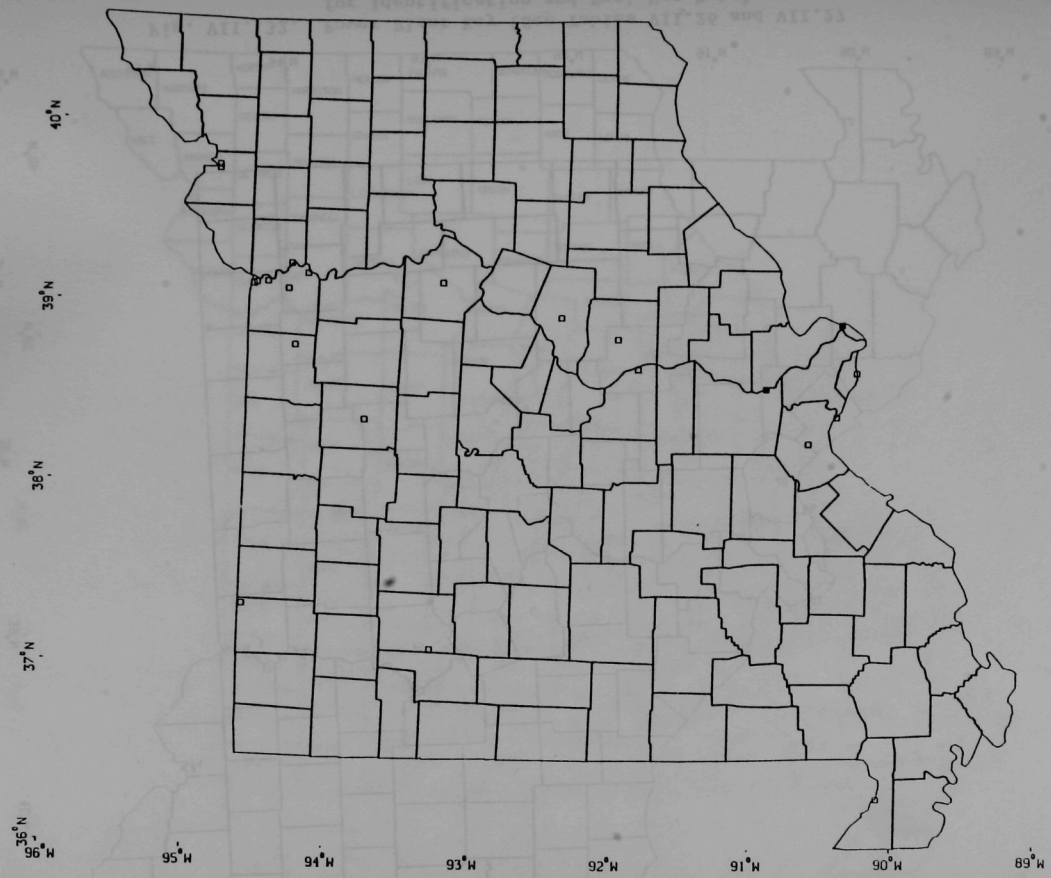


Fig. VII 131. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

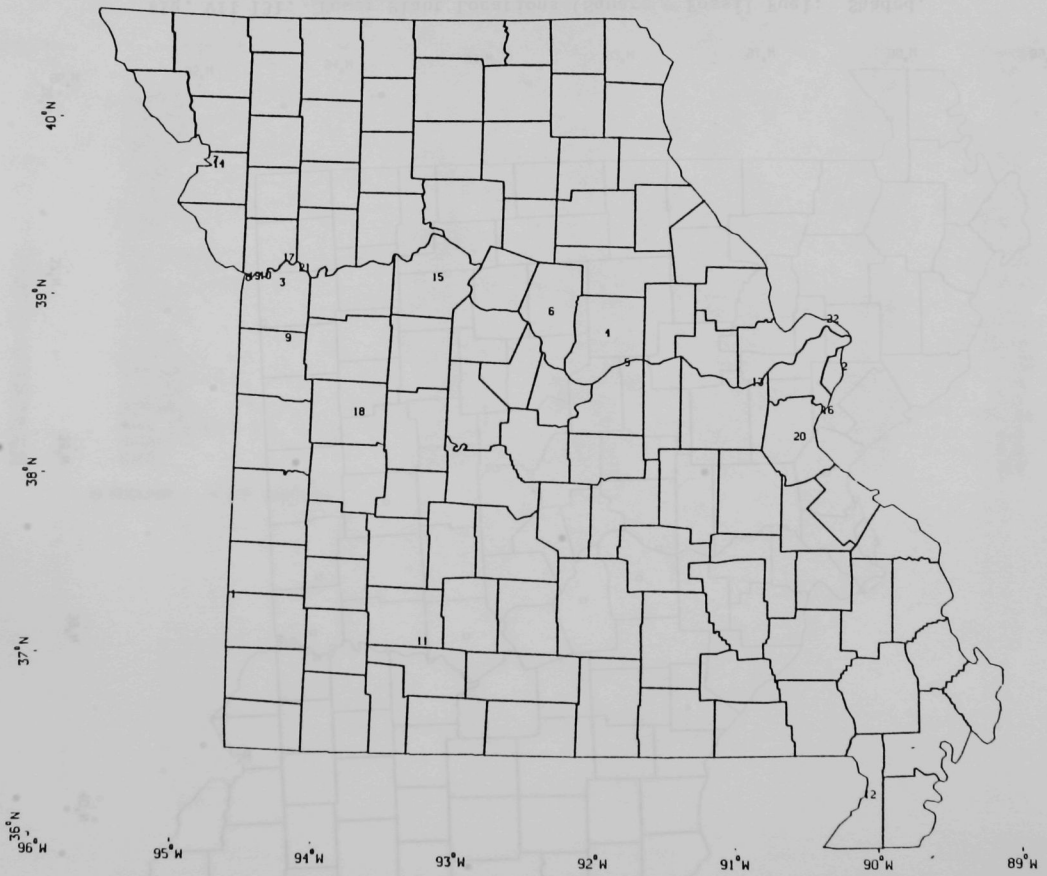


Fig. VII.132. Power Plant Key (See Tables VII.26 and VII.27 for Identification and Fuel Use Data)

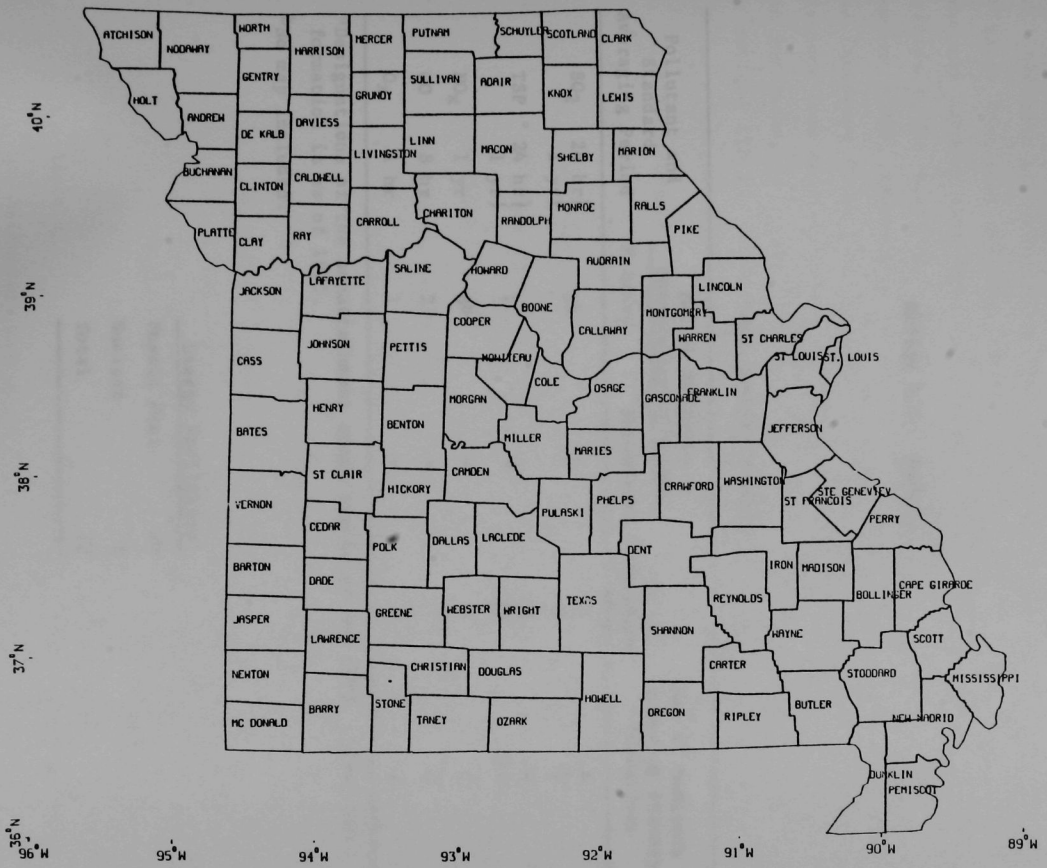


Fig. VII.133. Missouri: Key to Counties

REGION VII: NEBRASKA

Air Quality Summary

Pollutant and Standard Averaging Period		No. of Discrete Nonattainment Areas[a]		No. of Monitors	No. of Monitors Recording Primary Violations
		Primary	Secondary		
SO_2	24 hr	0[b]	0	17	5
	1 yr			8	2
TSP	24 hr	1	0	48	8
	1 yr			36	17
NO_x	1 yr	0[b]	-	8	0
CO	8 hr	2	-	3	3
O_x	1 hr	1	-	2	2

[a]Designations of the nonattainment areas are as of May 1979. Other information is as of 1975.

[b]No map included.

Energy Facilities	
Fossil Fuel	10
Nuclear	2
Total	12

NEBRASKA (Draft SIP, to be reviewed)

I. SOURCES OF THE PROBLEM

Nebraska has primary nonattainment areas for TSP in AQCR 085 (Douglas and Sarpy Counties) and Cass County -- all surrounding the city of Omaha. Omaha and Lincoln have both been designated as in nonattainment for carbon monoxide. The state submitted a plan for CO attainment for Lincoln in November, 1979, requesting reclassification for all except a small central area (Antelope Creek Basin), which remains in nonattainment as a result of emissions from motor vehicles. AQCR 085 has been designated as in nonattainment for ozone, as a result of motor vehicle traffic in Omaha. Submission of the revised SIP has been delayed, with state officials estimating January, 1980, as a "target" date.

II. ATTAINMENT STRATEGIES

A. TSP

1. Cass County

a. Need to control several point sources

2. Douglas County

a. Omaha city asphalt plant

- source of fugitive emissions
- to be controlled

b. Urban fugitive dust is a major problem

- street cleaning
- street washing
- reducing amount of dirt carried out of construction sites

B. TSP

1. Lincoln

a. Reclassify most of the city

b. FMVECP judged to be adequate

c. Resite monitors

III. NEW SOURCE REVIEW

Nebraska expects to follow an emission offset policy, in accordance with the EPA's ruling.

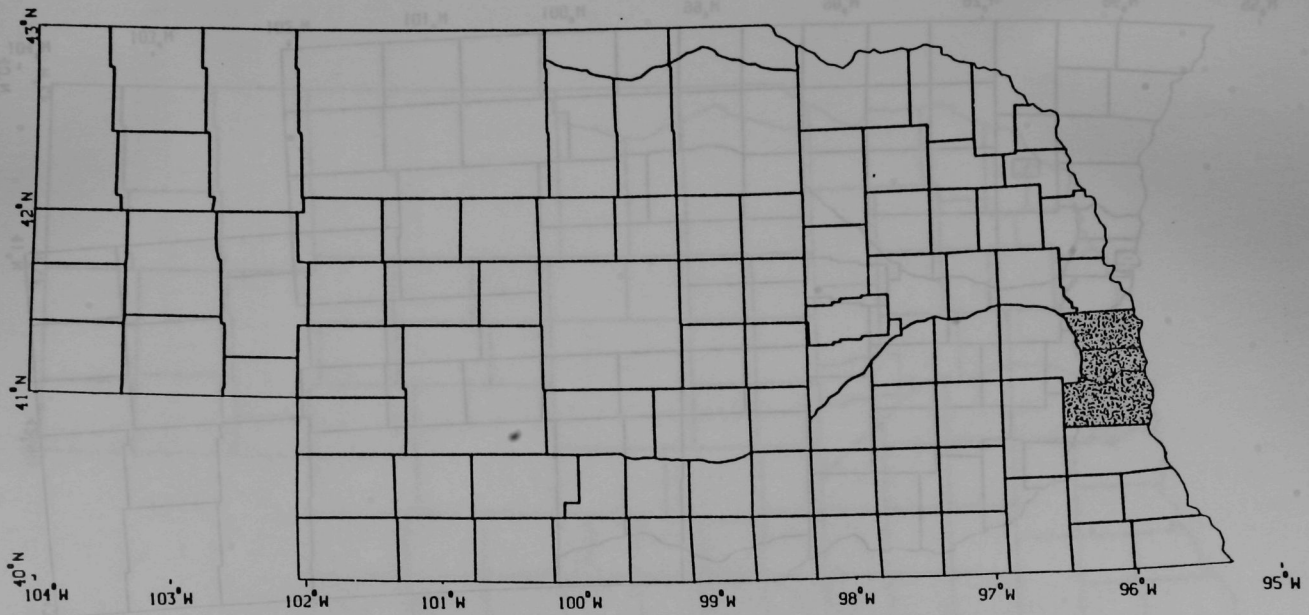
IV. EMISSION LIMITATIONS FOR FUEL COMBUSTION

A. SO_2

1. Existing sources: 2.5 lb SO_2/MM Btu

B. TSP

1. Sources with heat input $\leq$ 10 MM Btu/hr: 0.6 lb PM/MM Btu
2. Sources with heat input > 3,800 MM Btu/hr: 0.15 lb PM/MM Btu
3. Interpolate between the above limits for sources of intermediate capacity



PRIMARY TSP NONATTAINMENT

Fig. VII.134. Nebraska: TSP Nonattainment Areas as Designated May 1979

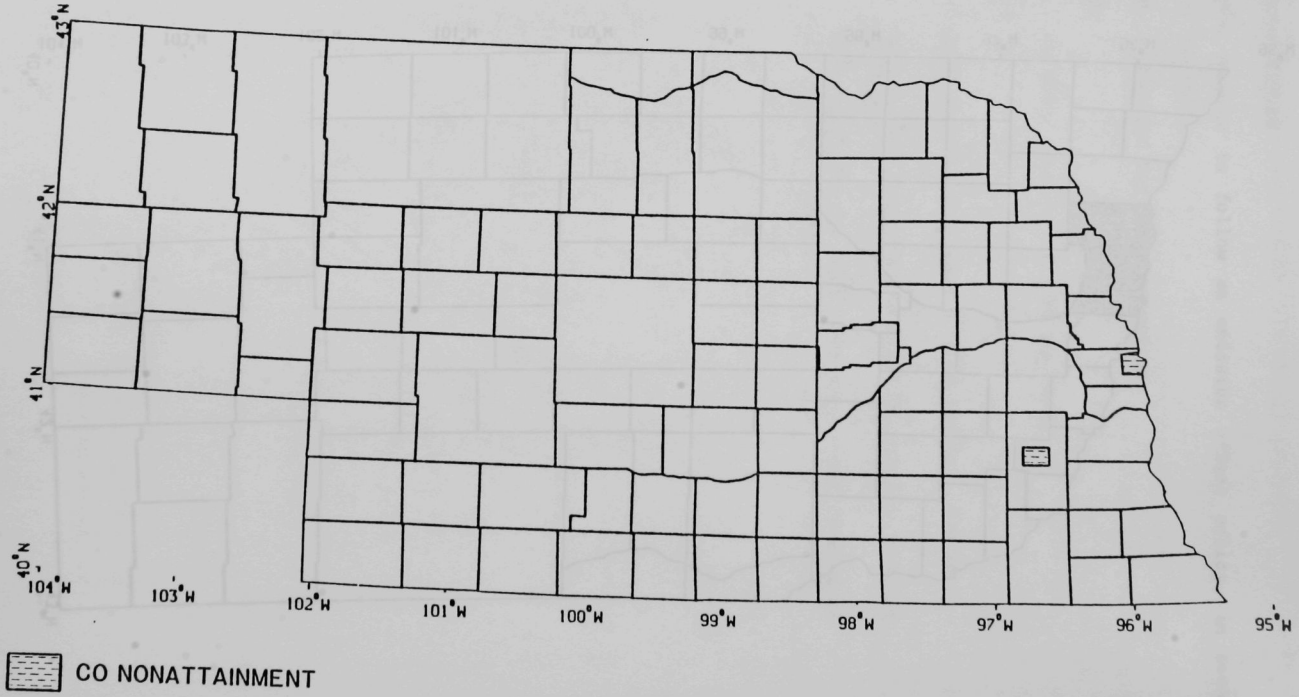
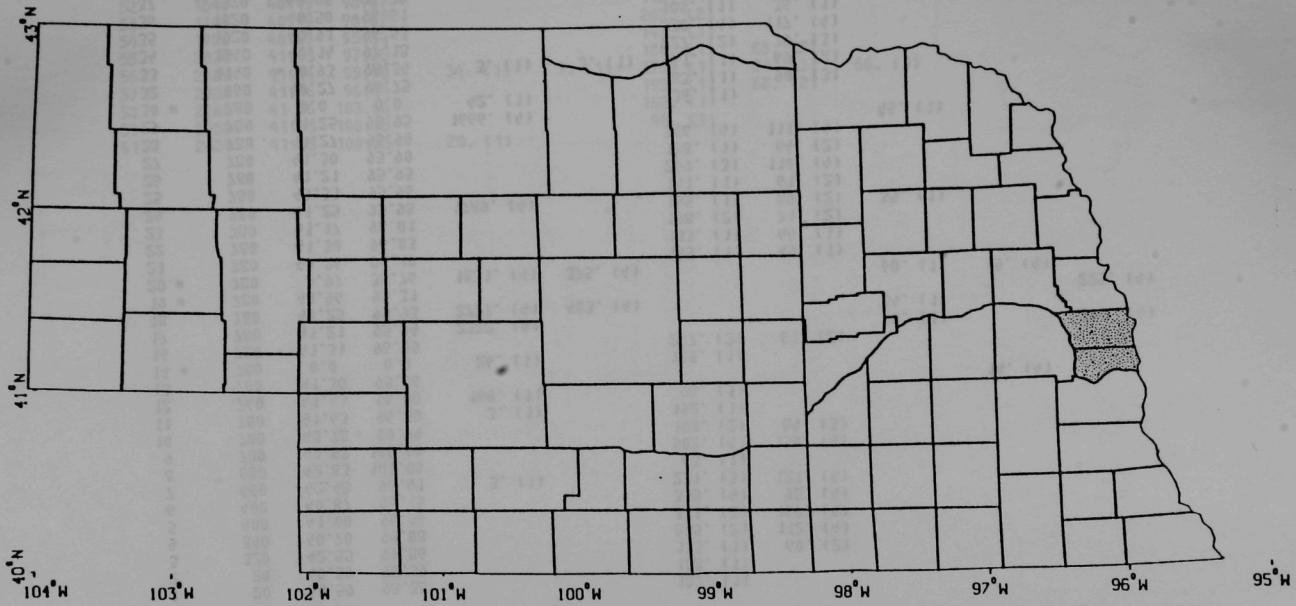


Fig. VII.135. Nebraska: CO Nonattainment Areas as Designated May 1979



O_X NONATTAINMENT

Fig. VII.136. Nebraska: O_X Nonattainment Areas as Designated May 1979

Table VII.28. Nebraska: SAROAD Monitor Numbers and 1975 Data
($\mu g/m^3$, or mg/m^3 for CO)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
1	20	40.59	98.38			189. (1)				
2	20	40.59	98.39			138. (1)				
3	320	42.55	99.86			133. (1)	60. (2)			
4	340	40.70	99.08			255. (2)	112. (4)			
5	400	41.00	96.16			311. (3)	109. (4)			
6	400	40.87	96.15			335. (4)	95. (4)			
7	660	42.48	96.41	3. (1)		271. (3)	121. (4)			
8	680	42.83	103.00			63. (1)				
9	700	40.92	100.00			502. (4)	130. (4)			
10	700	40.73	99.74			193. (2)	84. (3)			
11	760	41.43	96.50	3. (1)		152. (1)				
12	760	41.43	96.50	160. (1)		93. (1)				
13	780	41.30	95.96						14. (4)	
14 *	780	0.0	0.0	26. (1)		125. (1)				
16	780	41.31	96.05			207. (2)	61. (2)			
17	780	41.21	95.94	2122. (4)				40. (1)		206. (4)
18	780	41.25	95.93	2777. (4)	483. (4)			34. (1)		
19 *	780	41.96	95.31							225. (4)
20 *	780	5.97	33.76	1831. (4)	375. (4)			60. (1)	15. (4)	
21	780	41.26	96.10			145. (1)	49. (1)			
22	780	41.30	96.03			133. (1)	44. (1)			
23	780	41.17	96.01			198. (2)	71. (2)			
24	780	41.25	95.93	1789. (4)		165. (1)	60. (2)	35. (1)		
25	780	41.33	95.96			141. (1)	61. (2)			
26	780	41.21	95.95			269. (3)	110. (4)			
27	780	41.30	95.90			188. (1)	64. (2)			
28	780	41.27	95.90			346. (4)	111. (4)			
29	780	41.25	95.95	1666. (4)				46. (1)		
30 *	780	0.0	0.0	42. (1)		136. (1)				
32	960	40.27	96.75			183. (1)	90. (3)			
33	1140	40.93	98.34	3. (1)	3. (1)	161. (1)	69. (2)			
34	1340	40.14	97.18			227. (2)	79. (3)			
35	1520	40.91	96.53			330. (4)	117. (4)			
36	1520	40.50	96.61			108. (1)	36. (1)			
37	1520	40.95	96.78			144. (1)	51. (1)			
38	1520	40.68	96.51			440. (4)	117. (4)			
39	1520	40.54	96.78	34. (1)	8. (1)	135. (1)	53. (1)			
40	1520	40.73	96.84			132. (1)	53. (1)			
42 *	1520	0.0	0.0	39. (1)	13. (1)	111. (1)	59. (2)	32. (1)		
44	1520	40.81	96.68						20. (4)	
45	1520	40.85	96.63			160. (1)	76. (3)			
46	1520	40.85	96.70			143. (1)	56. (1)			
47	1520	40.81	96.71	10. (1)	6. (1)	197. (2)	85. (3)	38. (1)		
48	1520	40.81	96.65			120. (1)	66. (2)			

Table VII.28. (Cont'd)

MONITOR NUMBER	SAROAD COUNTY CODE	LAT	LONG	SO2 24-HR	SO2 1-YR	TSP 24-HR	TSP 1-YR	NOX 1-YR	CO 8-HR	OX 1-HR
49 *	1560	0.0	0.0			84. (1)	30. (1)			
50	1580	41.13	100.77	3. (1)	3. (1)	116. (1)	61. (2)			
51	1680	42.03	97.42			214. (2)	90. (3)			
52	1840	40.19	98.07			148. (1)				
53	1840	40.19	98.07			202. (2)				
54	1920	40.69	95.84			147. (1)				
55	2020	41.43	97.35			180. (1)	83. (3)			
56	2180	41.14	95.90	34. (1)	7. (1)	176. (1)	81. (3)	66. (1)		
57	2180	41.16	96.04			195. (1)	68. (2)			
58	2260	41.86	103.66			162. (1)				
59	2480	41.88	100.35			44. (1)				
61	2480	41.88	100.35	20. (1)						

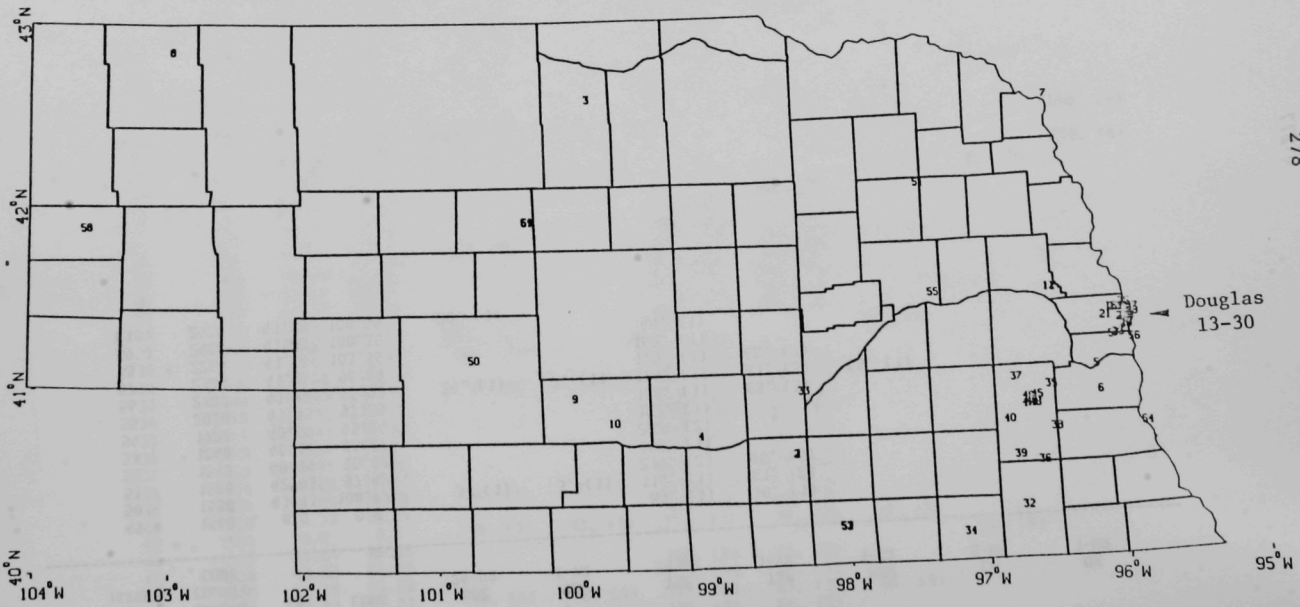


Fig. VII.137. Nebraska: Locations of SAROAD Monitors (See Table VII.28 for Monitor Numbers)

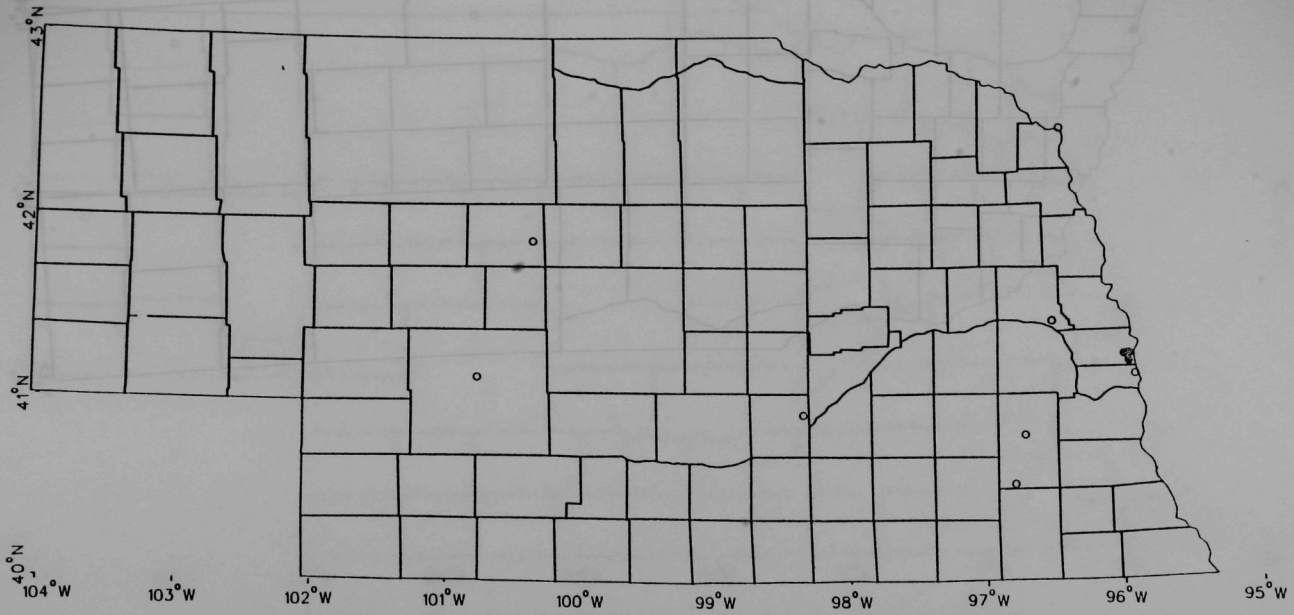


Fig. VII.138. Nebraska: Monitors Reporting Adequate Data on 24-hr Average SO_2; Violations Shown by Shaded Circles

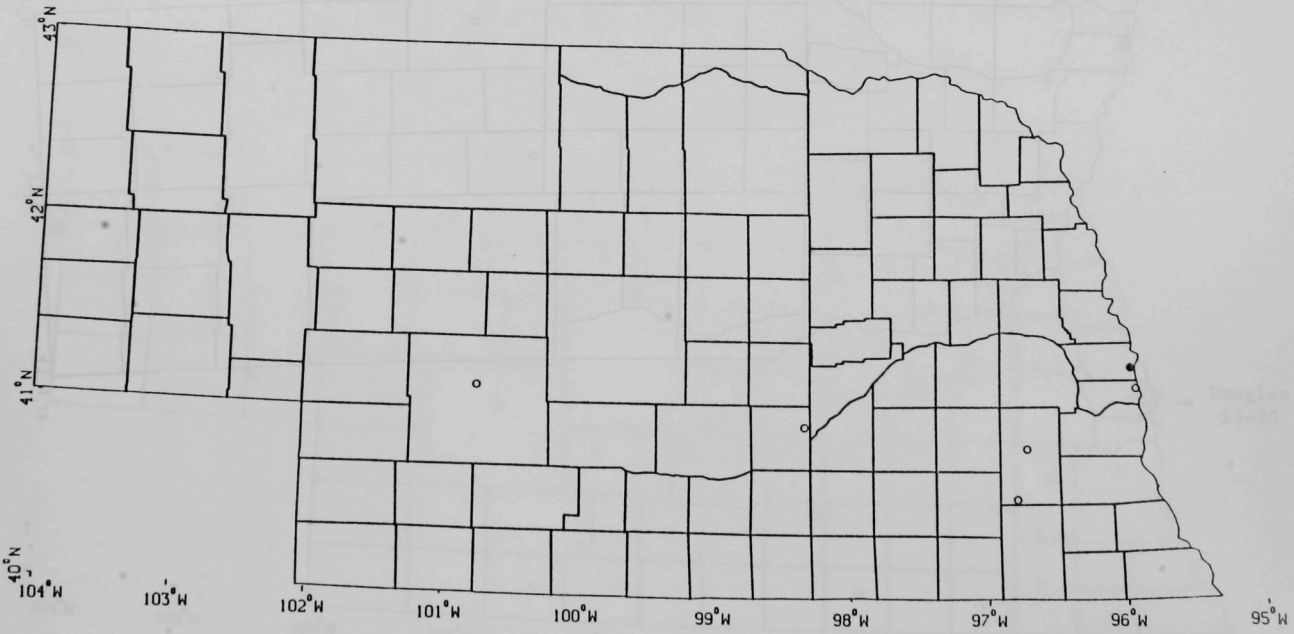


Fig. VII.139. Nebraska: Monitors Reporting Adequate Data on Annual Average SO_2; Violations Shown by Shaded Circles

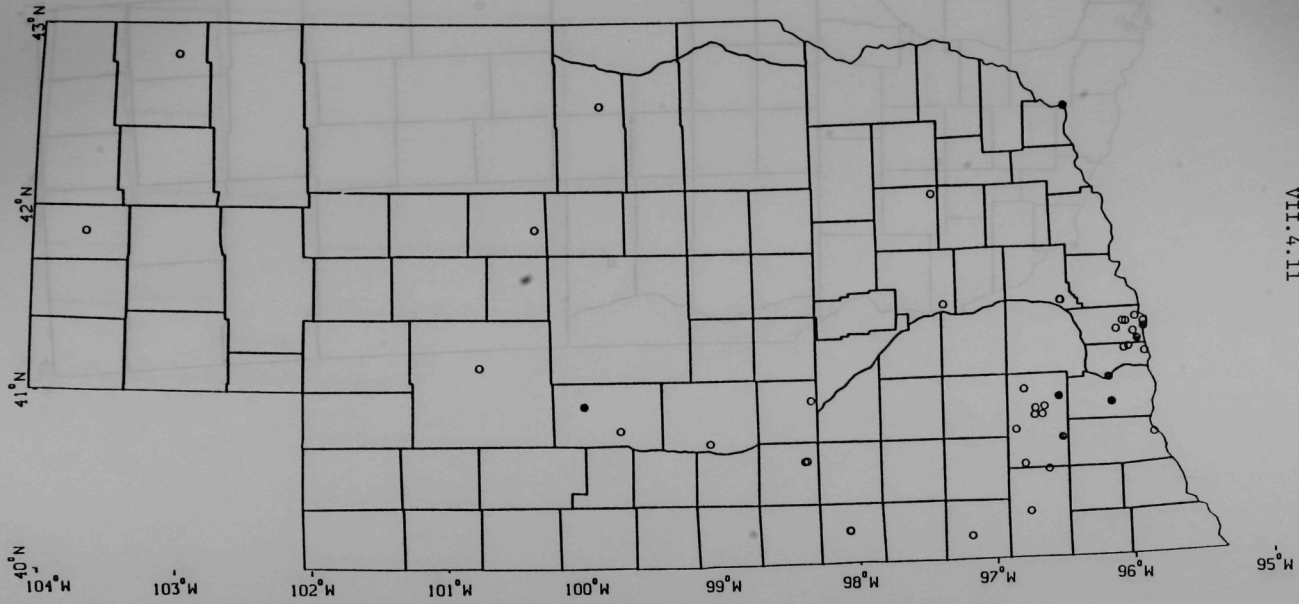


Fig. VII.140. Nebraska: Monitors Reporting Adequate Data on 24-hr Average TSP; Violations Shown by Shaded Circles

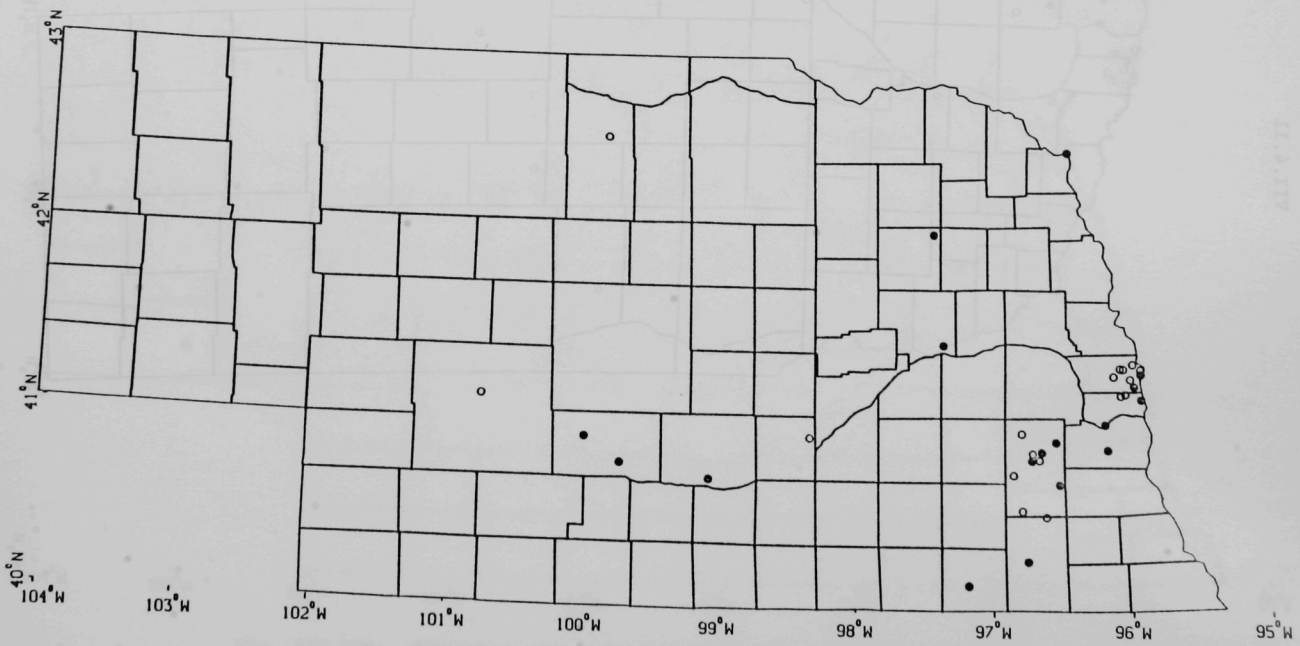


Fig. VII.141. Nebraska: Monitors Reporting Adequate Data on Annual Average TSP; Violations Shown by Shaded Circles

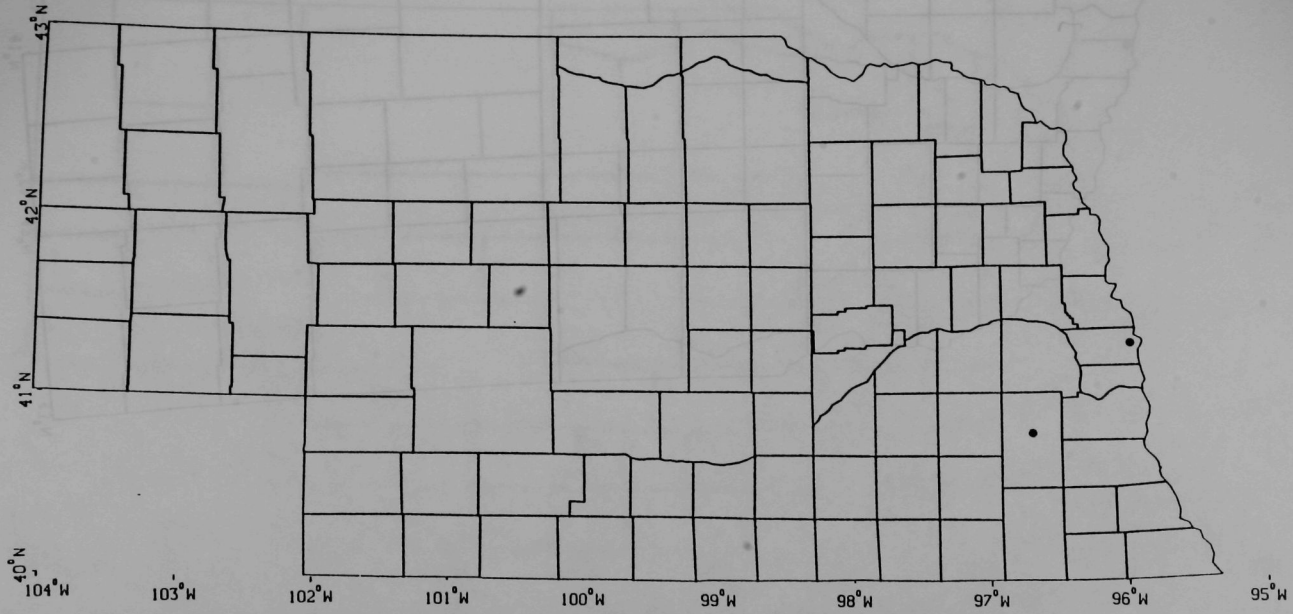


Fig. VII.142. Nebraska: Monitors Reporting Adequate Data on 8-hr Average CO; Violations Shown by Shaded Circles

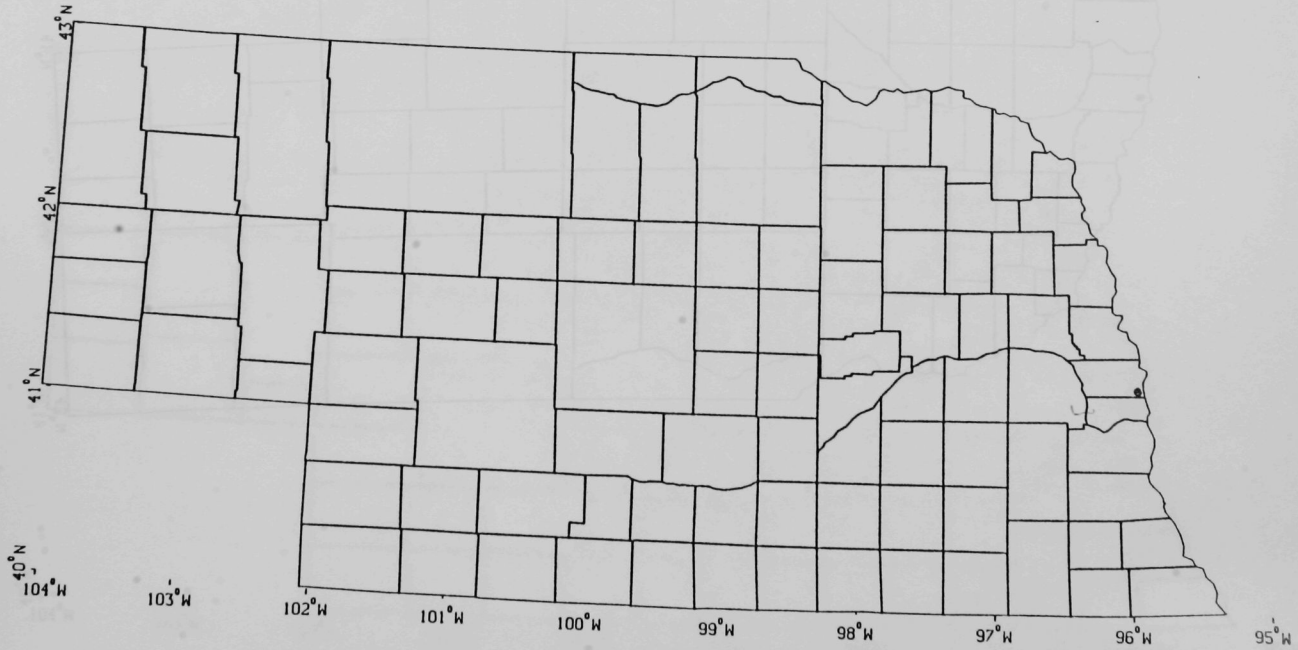


Fig. VII.143. Nebraska: Monitors Reporting Adequate Data on 1-hr Average O_x; Violations Shown by Shaded Circles

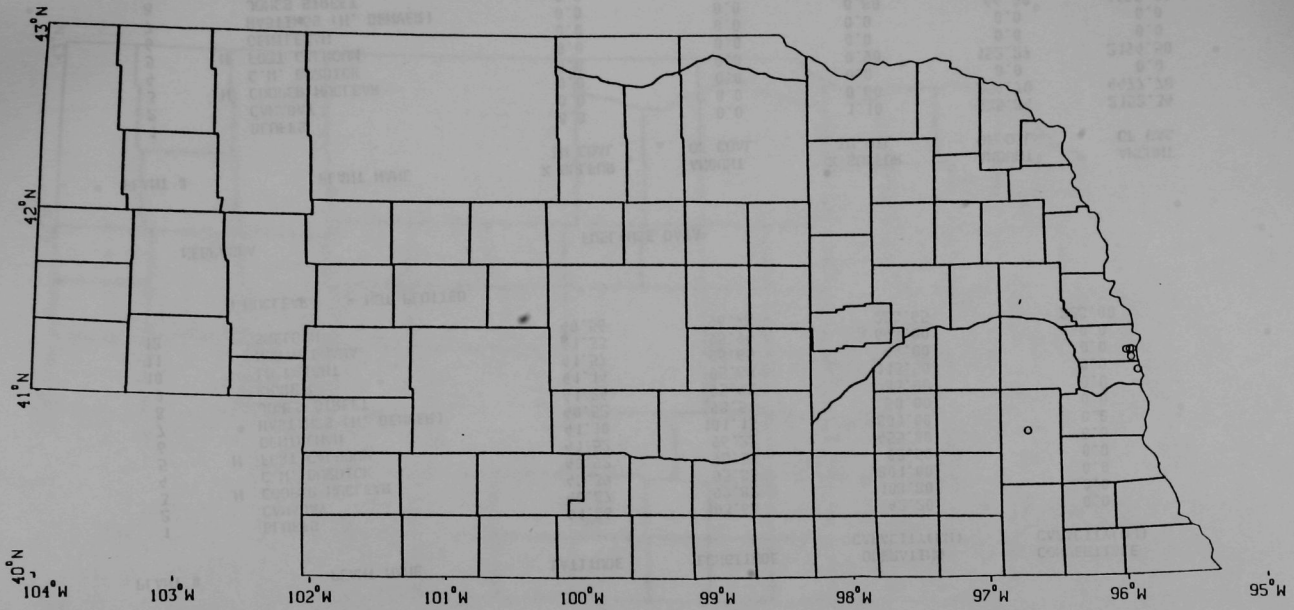


Fig. VII.144. Nebraska: Monitors Reporting Adequate Data on Annual Average NO_x; No Violations

Table VII.29. Nebraska: Power Plant and Fuel Use Data

NEBRASKA POWER PLANT DATA

PLANT #		PLANT NAME	LATITUDE	LONGITUDE	OPERATING CAPACITY(MW)	CONVERTIBLE CAPACITY(MW)
1		BLUFFS	41.86	103.66	42.20	0.0
2		CANADAY	40.87	99.82	103.80	0.0
3	N	COOPER NUCLEAR	40.39	95.85	801.00	0.0
4		C.N. BURDICK	40.92	98.33	92.50	0.0
5	N	FORT CALHOUN	41.52	96.22	455.00	0.0
6		GENTLEMAN	41.10	101.13	801.00	0.0
7		HASTINGS (N. DENVER)	40.52	98.51	50.00	0.0
8		JONES STREET	41.24	95.92	83.00	0.0
9		KRAMER	41.14	95.89	113.50	0.0
10		LD WRIGHT	41.57	96.65	44.00	0.0
11		NORTH OMAHA	41.33	95.94	646.00	0.0
12		SHELDON	40.56	96.78	228.65	228.00

N NUCLEAR * NOT PLOTTED

NEBRASKA FUEL-USE DATA

PLANT #		PLANT NAME	% SULFUR IN COAL	AMOUNT OF COAL	% SULFUR IN OIL	AMOUNT OF OIL	AMOUNT OF GAS
1		BLUFFS	0.0	0.0	1.10	125.84	2152.34
2		CANADAY	0.0	0.0	0.60	254.70	4477.70
3	N	COOPER NUCLEAR	0.0	0.0	0.0	0.0	0.0
4		C.N. BURDICK	0.0	0.0	0.90	152.27	2194.50
5	N	FORT CALHOUN	0.0	0.0	0.0	0.0	0.0
6		GENTLEMAN	0.0	0.0	0.0	0.0	0.0
7		HASTINGS (N. DENVER)	0.0	0.0	0.80	44.20	1432.60
8		JONES STREET	0.0	0.0	0.25	40.54	581.21
9		KRAMER	0.77	210.80	0.0	0.0	2041.40
10		LD WRIGHT	0.70	36.80	0.0	0.0	1159.53
11		NORTH OMAHA	0.71	803.01	0.0	0.0	12773.05
12		SHELDON	1.82	199.12	0.0	0.0	3397.63

N NUCLEAR * NOT PLOTTED

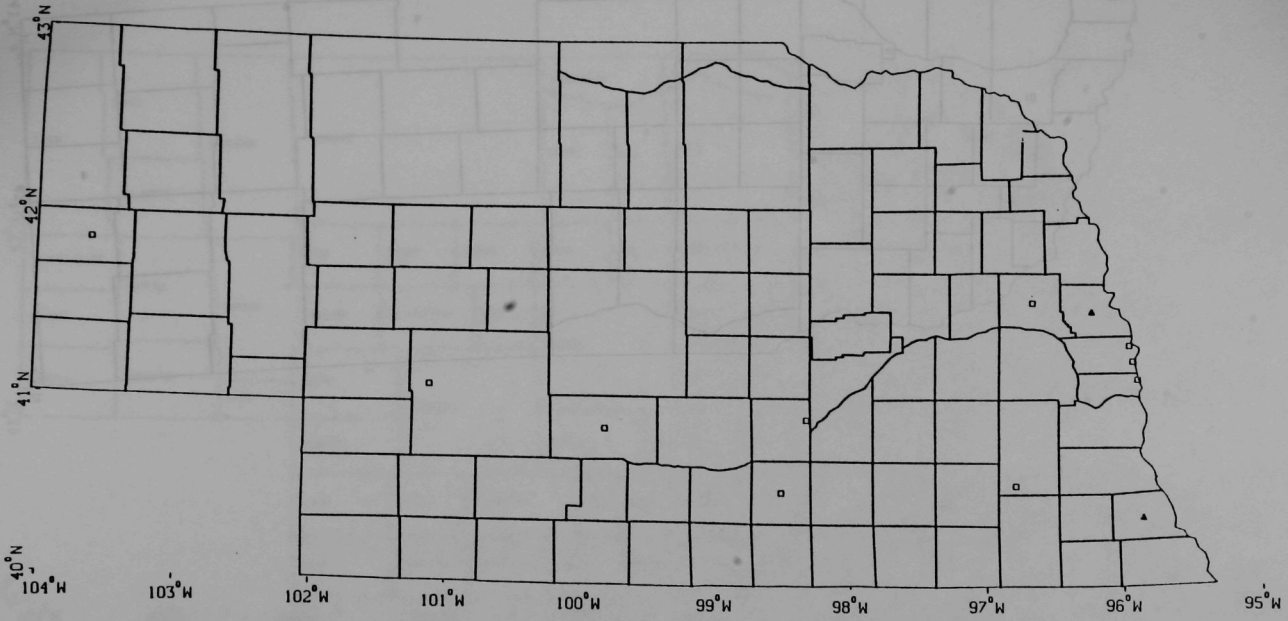


Fig. VII 145. Power Plant Locations (Square = Fossil Fuel: Shaded, ≥1000 MW; Open, <1000 MW. Triangle = Nuclear)

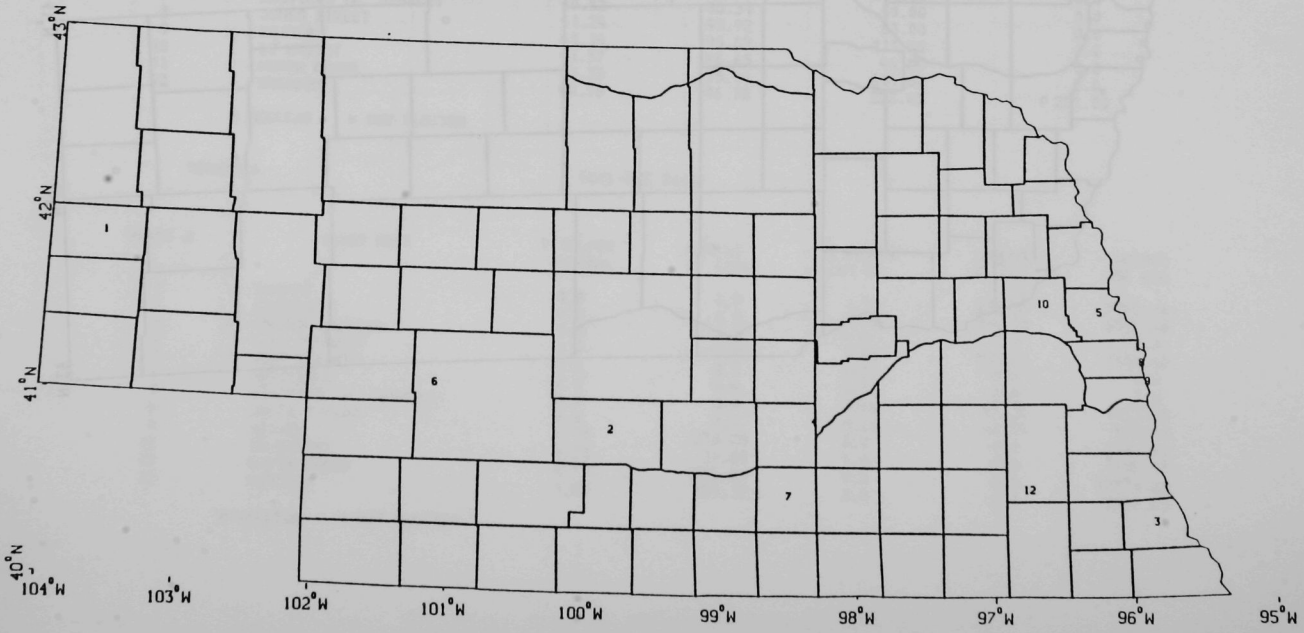


Fig. VII.146. Power Plant Key (See Table VII.29 for Identification and Fuel Use Data)

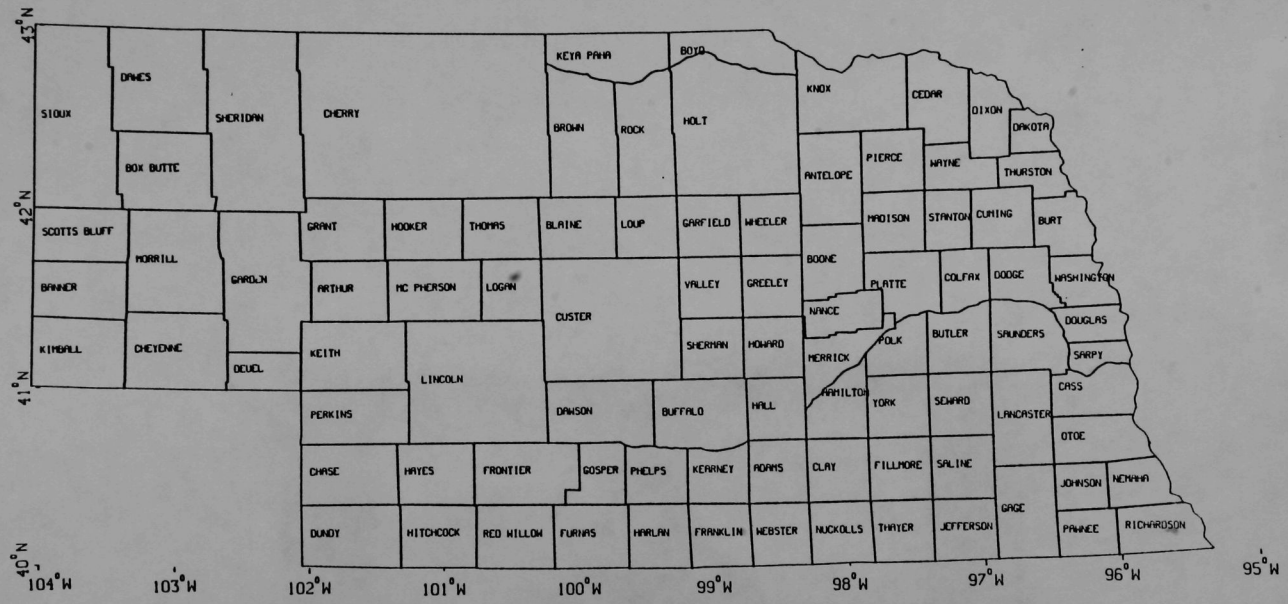


Fig. VII.147. Nebraska: Key to Counties

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