1986

STATE OF CONNECTICUT
ANNUAL AIR QUALITY SUMMARY

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TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

I. INTRODUCTION

The 1986 Air Quality Summary of Ambient Air Quality in Connecticut is a compilation of all air pollutant measurements made at the Department of Environmental Protection (DEP) air monitoring network sites.

A. OVERVIEW OF AIR POLLUTANT CONCENTRATIONS IN CONNECTICUT

The assessment of ambient air quality in Connecticut is made by comparing the measured concentrations of a pollutant to each of two Federal air quality standards. The first is the primary standard which is established to protect public health with an adequate margin of safety. The second is the secondary standard which is established to protect plants and animals and to prevent economic damage. The specific air quality standards are listed in Table 1 along with the time and data constraints imposed on each.

The following section briefly describes the status of Connecticut's air quality for the year 1986. More detailed discussions of each of the six pollutants are provided in subsequent sections of this Air Quality Summary.

1. TOTAL SUSPENDED PARTICULATES (TSP)

Measured total suspended particulate (TSP) levels did not exceed the primary annual standard of 75 $\mu g/m^3$ or the secondary annual standard of 60 $\mu g/m^3$ in Connecticut during 1986. And neither the primary 24-hour standard of 260 $\mu g/m^3$ nor the secondary 24-hour standard of 150 $\mu g/m^3$ was exceeded at any site in 1986. Two exceedances of a standard are required at a particular site for the standard to be violated. No site recorded violations of any particulate standard in 1986.

In general, measured TSP levels in Connecticut were lower in 1986, in terms of annual average concentration values, than they were in 1985 (see Table 3).

2. SULFUR DIOXIDE (SO_2)

None of the air quality standards for sulfur dioxide were exceeded in Connecticut in 1986. Measured concentrations were below the 80 $\mu g/m^3$ primary annual standard, the 365 $\mu g/m^3$ primary 24-hour standard, and the 1300 $\mu g/m^3$ secondary 3-hour standard.

The results of continuous SO_2 monitoring indicate that sulfur dioxide levels in 1986 were not significantly different from those in 1985 (see Table 4). Temperature is an important factor in determining SO_2 emissions. The lack of change in measured SO_2 levels may have been due to the fact that, for Connecticut, 1986 was not appreciably warmer than 1985. This can be shown by the number of "degree days" : a measure of heating requirement (see Tables 31 and 32). As the number of degree days increases, the amount of fuel that must be burned to heat buildings also increases. Consequently, as more fossil fuel is burned, the emissions of sulfur oxides are proportionately increased. There was only about a 1% increase in degree days for Connecticut as a whole from 1985 to 1986.

3. OZONE (O_3)

National Ambient Air Quality Standards (NAAQS) - On February 8, 1979, the U.S. Environmental Protection Agency (EPA) established an ambient air quality standard for ozone of 0.12 ppm for a one-hour average. That level is not to be exceeded more than once per year. Furthermore, in order to determine compliance with the 0.12 ppm ozone standard, EPA directs the states to record the number of daily exceedances of 0.12 ppm at a given monitoring site over a consecutive 3-year period and then calculate the average number of daily exceedances for this interval. If the resulting average value is less than or equal to 1.0, (that is, if the fourth highest daily value in a consecutive 3-year period is less than or equal to 0.12 ppm), the ozone standard is considered to be attained. The definition of the pollutant was also changed, along with the numerical value of the standard, partly because the instruments used to measure photochemical oxidants in the air really measure only ozone. Ozone is one of a group of chemicals which are formed photochemically in the air and are called photochemical oxidants. In the past, the two terms have often been used interchangeably. This 1986 Air Quality Summary uses the term "ozone" in conjunction with the new NAAQS to reflect the changes in both the numerical value of the NAAQS and the definition of the pollutant.

The primary 1-hour ozone standard was exceeded at all the DEP monitoring sites in 1986 (see Table 2).

The incidence of ozone levels in excess of the 1-hour 0.12 ppm ozone standard decreased significantly from 1985 to 1986 (see Tables 18 and 19). Most of this difference is attributable to the changes in meteorological factors which occur from year-to-year. The formation of ozone is facilitated by high temperatures and strong sunlight in the presence of hydrocarbons and oxides of nitrogen. The prevailing southwest wind transports hydrocarbons and nitrogen oxides generated in the New Jersey - New York City Metropolitan Area into Connecticut. Along the way, these chemicals react in the presence of strong sunlight, forming ozone. Consequently, the ozone levels across Connecticut are highest when the prevailing wind flow is out of the southwest (see Table 21). However, there are recorded exceedences of the NAAQS for ozone on non-southwest wind days. This suggests that pollution control programs currently being implemented in this state are needed to protect the public health of Connecticut's citizenry on days when Connecticut is responsible for its own pollution.

4. NITROGEN DIOXIDE (NO_2)

The annual average NO_2 standard of 100 $\mu g/m^3$ was not exceeded at any site in Connecticut in 1986.

5. CARBON MONOXIDE (CO)

The primary eight-hour standard of 9 ppm was exceeded at two of the five carbon monoxide monitoring sites in Connecticut during 1986 (see Table 2). The standard was exceeded three times at Hartford 017 and once at Stamford 020. Two exceedances at a particular site are required for a standard to be violated. This means that the eight-hour standard was violated at Hartford 017 in 1986. A violation occurred at both Hartford 017 and Stamford 020 in 1985.

There were no violations of the primary one-hour standard of 35 ppm in 1986.

TABLE 1

ASSESSMENT OF AMBIENT AIR QUALITY

POLLUTANT	SAMPLING PERIOD	DATA REDUCTION	STATISTICAL BASE	AMBIENT AIR QUALITY STANDARDS			
				PRIMARY		SECONDARY	
				μg/m³	ppm	μg/m³	ppm
Total Suspended Particulates	24 Hours (every sixth day)[1]	24-Hour Average	Annual Geometric Mean	75		60*	
			24-Hour Average[3]	260		150	
Sulfur Oxides (measured as sulfur dioxide)	Continuous[2]	1-Hour Average	Annual Arithmetic Mean	80	0.03		
			24-Hour Average[3]	365	0.14		
			3-Hour Average[3]			1300	
Nitrogen Dioxide	Continuous[2]	1-Hour Average	Annual Arithmetic Mean	100	0.05	100	0.05
Ozone	Continuous[2]	1-Hour Average	1-Hour Average[4]	235	0.12	235	0.12
Lead	24 Hours (every sixth day)[5]	Monthly Composite	Weighted 3-Month Average	1.5		1.5	
Carbon Monoxide	Continuous[2]	1-Hour Average	8-Hour Average[3]	10**	9	10**	9
			1-Hour Average[3]	40**	35	40**	35

[1] EPA assessment criteria require at least 5 samples per calendar quarter and, if one month has no samples, then the other two months in that quarter must have at least two samples each.
[2] EPA assessment criteria require at least 75% of the possible data to compute a valid average.
[3] Not to be exceeded more than once per year.
[4] Not to be exceeded more than an average of once per year in three years.
[5] State of Connecticut assessment criteria require 75% of the possible data to compute a valid average.
* A guide to be used in assessing implementation plans to achieve the 24-hour standard.
** Units are mg/m³.

TABLE 2

AIR QUALITY STANDARDS EXCEEDED IN CONNECTICUT IN 1986 BASED ON MEASURED CONCENTRATIONS

		OZONE		CARBON MONOXIDE	
		Level Exceeding 1-Hour Standard		Level Exceeding 8-Hour Standard	
TOWN	SITE	Highest Observed Level (ppm)	Number of Days Standard Exceeded	Highest Observed Level 8-Hour / 1-Hour (ppm)	Number of Times Standard Exceeded
Bridgeport	123	0.158	6	-	-
Danbury	123	0.133	1	-	-
East Hartford	003	0.133	1	-	-
Greenwich	017	0.193	3	-	-
Groton	008	0.176	5	-	-
Hartford	017	-	-	11.0 / 19.0	3
Madison	002	0.152	4	-	-
Middletown	007	0.179	2	-	-
New Haven	123	0.170	2	-	-
Stafford	001	0.145	1	-	-
Stamford	020	-	-	10.9 / 16.4	1
Stratford	007	0.159	8	-	-

- : The pollutant is not monitored at the site.

6. LEAD (Pb)

The primary and secondary ambient air quality standard for lead is 1.5 µg/m^3,maximum arithmetic mean averaged over three consecutive calendar months. As was the case in 1985, the lead standard was not exceeded at any site in Connecticut during 1986.

A downward trend in measured concentrations of lead has been observed since 1978. This trend is probably due to the decreasing use of leaded gasoline.

B. TRENDS

Any attempt to assess statewide trends in air pollution levels must account for the tendency of local changes to obscure the statewide pattern. In order to reach some statistically valid conclusions concerning trends in pollutant levels in Connecticut, the DEP has applied a statistical test called a paired *t* test (referred to hereafter as the *t* test) to the annual average data for two pollutants. The *t* test has been applied to 1976-1986 total suspended particulate (TSP) data and to 1978-1986 continuous SO_2 data.

The *t* test is a parametric test which can ascertain statistically significant changes (increases or decreases) in the annual average pollutant concentrations at all the monitoring sites in Connecticut. The *t* test makes it possible to overcome the trend analysis problems which arise due to the changes in the number and location of monitoring sites from year-to-year, as well as problems associated with making equitable comparisons among sites. The annual mean pollutant concentrations for consecutive years are compared at each site; there is no inter-site comparison. Data for two consecutive years are required and the size of the change (increase or decrease) is noted. For example, if a high proportion of sites experienced an increase and/or if the magnitude of the increases at several sites is of much greater importance than the magnitude of the decreases at other sites, the *t* test will show that the increase was statistically significant for those two years.

The results of the *t* test for TSP and continuous SO2 data are presented in Tables 3 and 4, respectively. These analyses were performed only on data computed for sites at which the EPA's minimum sampling criteria were met. The years of data that were paired, the number of sites used, and the statewide average and standard deviation of the geometric mean pollutant concentrations at the sites are provided in the first four columns of each table. The statistical significance of any change in the statewide pollutant average is provided in the remaining columns. The significance of a change is indicated by an arrow for each confidence limit, and is also given numerically as the number of chances in 10,000 of not occurring under the heading "actual significance of change". For example, the statewide annual average for TSP decreased between 1977 and 1978 from 54.8 to 52.7. This change represented a significant decrease at the 95% confidence level, but it did not represent a significant change at the 99% confidence level. The "actual significance of change" is given as 0.0216, meaning that there are 216 chances in 10,000 that this measured decrease in TSP levels did not occur.

1. TSP

The results of the *t* test for TSP (see Table 3) show that total suspended particulate levels in Connecticut prior to 1985 improved year by year or remained unchanged, except for the periods 1981-1982 and 1983-1985 when levels increased significantly. The significant drop in measured TSP levels between 1979 and 1980 can be attributed to the elimination of passive sampling error through the use of retractable lids on the hi-vol monitors. From 1985 to 1986, there was again a significant improvement in TSP levels.

These trend analyses do not account for the uncertainty associated with the individual annual mean computed for each TSP site. Most TSP sampling is conducted only every sixth day,

TABLE 3

TSP TRENDS: 1976-1986
(PAIRED *t* TEST)

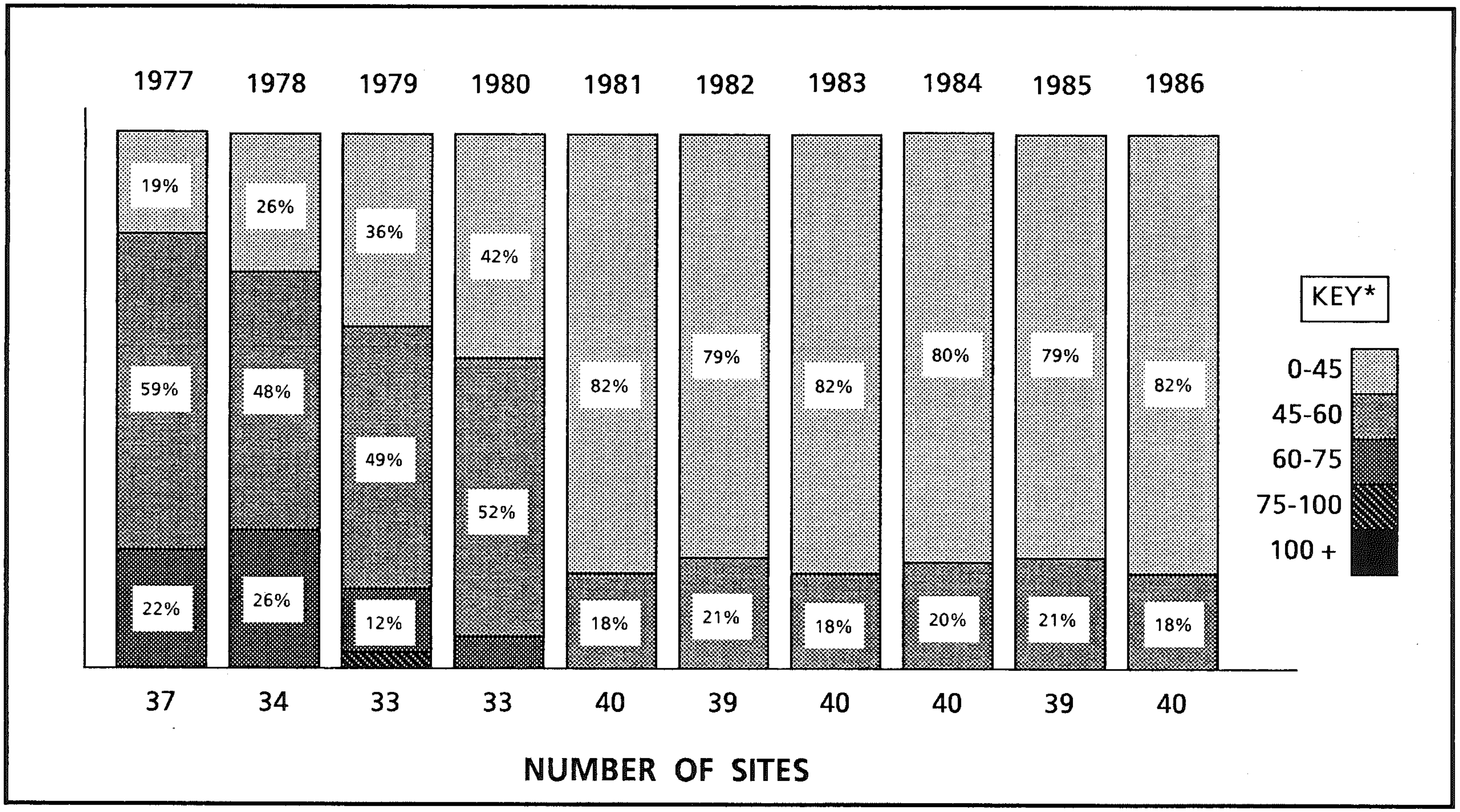
PAIRED YEARS	NUMBER OF SITES	AVERAGE OF ANNUAL GEOMETRIC MEANS (µg/m3)	STANDARD DEVIATION (µg/m3)	SIGNIFICANCE LEVEL		
				TREND AT		PROBABILITY THAT CHANGE IS NOT SIGNIFICANT
				95% LEVEL	99% LEVEL	
76 77	35 35	53.6 53.7	8.8 9.2	N.C.	N.C.	0.8715
77 78	30 30	54.8 52.7	9.8 9.3	↓	N.C.	0.0216
78 79	32 32	51.4 49.9	12.1 12.5	N.C.	N.C.	0.1530
79 80	32 32	49.3 45.4	13.2 10.0	↓	↓	0.0001
80 81	26 26	45.2 38.0	10.1 8.4	↓	↓	0.0001
81 82	37 37	38.3 40.5	6.8 8.0	↑	↑	0.0001
82 83	36 36	41.3 39.5	7.3 6.7	↓	↓	0.0001
83 84	38 38	39.6 40.5	6.7 6.5	↑	↑	0.0008
84 85	36 36	40.7 41.9	6.3 7.5	↑	N.C.	0.0141
85 86	39 39	41.4 39.7	7.7 7.4	↓	↓	0.0005

Key to Symbols : ↓ = Significant downward trend
↑ = Significant upward trend
N.C. = No significant change

FIGURE 1

TOTAL SUSPENDED PARTICULATE MATTER TREND

"PERCENT OF SITES WITHIN EACH RANGE"



PRIMARY ANNUAL STANDARD = 75 μg/m³

SECONDARY ANNUAL STANDARD = 60 μg/m³

* ANNUAL GEOMETRIC MEAN (μg/m³)

producing a maximum possible total of 61 samples per year. Therefore, the *t* test really compares year-to-year averages of the sampled concentrations, not actual annual averages. However, the every-sixth-day sampling schedule is believed to be sufficient to produce representative annual averages. The every-sixth-day schedule for TSP sampling began in 1971.

Significant changes in annual TSP levels can be caused by a number of things. Among these are simple changes of weather, particularly the wind; changes in annual fuel use associated with conservation efforts or heating demand; the frequency of precipitation events, which wash out particulates from the atmosphere; changes in average wind speed, since higher winds result in greater dilution of emissions; and a change in the frequency of southwesterly winds, which affect the amount of particulate matter transported into Connecticut from the New York City metropolitan area and from other sources of emissions located to the southwest.

Figure 1 shows the long-term trend of TSP concentrations in Connecticut in graphical form. The trend chart is based on data obtained from high volume sampling devices. High volume sampler data at a site are included only if there was a sufficient number of samples taken in a year to compute a valid annual geometric mean concentration.

2. SO_2

Connecticut has been measuring ambient levels of sulfur dioxide since prior to the inception of the SO_2 standards in 1971. Several monitoring methods have been employed including bubblers, sulfation plates, and various types of continuous instruments. The bubblers became the EPA reference method, but unfortunately the field data have turned out to be very unreliable. The sulfation plates were in use for 15 years, but they do not measure SO_2 directly. Sulfation rate-derived SO_2 values were thought to be reliable, but recent information has cast doubt on their reliability. Continuous monitors presently yield reliable data, but this has not always been the case. The earliest continuous monitors (conductometric and coulometric) were subject to interference from many chemicals other than SO_2 and also had difficulties with quality control. Later generations of instruments (flame photometric and pulsed fluorescent) alleviated these problems, and there has been a corresponding increase in the reliability of the data, especially since 1978.

In order to perform a valid trend analysis, the data for the period of interest must be adequate, reliable and from similar sampling methods. Up until 1978, the only method which consistently fit these criteria was the sulfation plate. Between 1978 and 1982 there were approximately three times as much sulfation rate data as continuous SO_2 data and the former method was used for the purpose of analyzing SO_2 trends. However, recent information now indicates that sulfation rate-derived SO_2 values may not be as accurate as once thought. Sulfation rate data are dependent on relative humidity and wind speed -- being extremely sensitive to the latter -- and the precision of the data suffers even under uniform conditions. Furthermore, EPA has requested that DEP use continuous SO_2 data in order to analyze SO_2 trends. Consequently, the SO_2 trend analysis now uses only continuous SO_2 data. The data are restricted to the period 1977-1986 because earlier data are judged not to be adequate or reliable. The results are summarized in Table 4 and Figure 2. Table 4 does not present a trend analysis for the period 1977-1978 because the number of matched monitors for both years was 3 -- too few to establish an accurate statewide trend.

In response to the skyrocketing prices of low sulfur fuels in the late 1970's, most states relaxed their sulfur-in-fuel requirements to the full extent the law allowed, creating considerable pressure on Connecticut to follow suit. This caused Connecticut to reevaluate its philosophy for controlling sulfur oxide emissions in 1981. To meet the challenge of increased costs of fuel in the economy, DEP restructured its air pollution control requirements for fuel burning sources. Under this new "three-pronged" program, Connecticut's businesses and industries are (1) now allowed (effective November 1981) to burn a less expensive grade of oil with a higher sulfur content -- one percent (1.0%) sulfur oil, and (2) allowed to burn higher sulfur content oil in exchange for reductions in energy use. The third aspect of the program is the repeal of the 24-hour secondary air quality standard for sulfur oxides.

This action increased statewide allowable sulfur oxide emissions by almost 60%. (Sulfur oxide emissions were not doubled by going from 0.5% to 1.0% sulfur-in-fuel since residential fuel users, which account for almost one-third of annual statewide sulfur oxide emissions, use distillate fuel oil with a sulfur content of less than 0.5%.) One would expect measured SO_2 levels to increase in 1982 and subsequent years, as compared to 1981, due to the use of 1.0% sulfur oil. However, no significant trend was apparent in 1982; SO_2 levels actually declined in 1983; and since 1983, there has been no significant change in SO_2 levels (see Table 4). This may be attributable to year-to-year fluctuations in meteorology or decreased fuel use caused by increased fuel prices and/or increased fuel efficiency (i.e., 'tighter' buildings).

The long-term trend of SO_2 concentrations is shown in graphical form in Figure 2. An improvement in SO_2 levels is demonstrated by the decrease over time of concentrations in excess of 40 $\mu g/m^3$. Table 4 shows the year-to-year trend in ambient SO_2 levels. Decreases in SO_2 concentrations from 1979 to 1980 and from 1982 to 1983 are evident. However, no significant change in SO_2 levels is evident since 1983.

Continuous SO_2 monitors were operated each year at five (5) sites between 1981 and 1986. The mean SO_2 levels at these five locations are depicted in Figures 2A through 2D. Figure 2A shows the annual geometric mean SO_2 levels at each of the five sites. There is no clear trend at any of the sites, except for decreasing levels at Bridgeport-123. Figure 2B shows the yearly average of the mean SO_2 concentrations at all the sites. Annual SO_2 levels appear to decrease from 1982 to 1984 and increase thereafter. Figure 2C illustrates the three-year running averages of the data depicted in Figure 2B. Three-year running averages tend to smooth out the year-to-year effects of meteorology on pollutant levels. Figure 2C apppears to show moderately decreasing levels of SO_2 over the past six years. Figure 2D is a linear regression of the data presented in Figure 2A. Although there appears to be a moderately decreasing trend in SO_2 levels, the 95% confidence limits do not confirm this. The confidence bands -- and the fact that much of the data lies outside these bands -- lead one to conclude that no valid statistical inference can be made about SO_2 trends during the period 1981-1986. This long term trend analysis also demonstrates that there is no clear evidence of any impact on SO_2 levels resulting from the State's decision to allow fuel burning sources to use 1% sulfur oil since 1982. This conclusion is reinforced by the data presented in Table 4.

C. AIR MONITORING NETWORK

A computerized Air Monitoring Network consisting of an IBM System 7 computer and numerous telemetered monitoring sites has operated in Connecticut for several years. In 1985, this data acquisition system was modernized by installing new data loggers at the monitoring sites and replacing the dedicated IBM System 7 computer with a non-dedicated Data General Eclipse MV/10000 computer. This essentially improved both data accuracy and data capture. As many as 12 measurement parameters are transmitted from a site via telephone lines to the Data General unit located in the DEP Hartford office. The data are then compiled twice daily into 24-hour summaries. The telemetered sites are located in the towns of Bridgeport, Danbury, East Hartford, East Haven, Enfield, Greenwich, Groton, Hartford, Madison, Middletown, Milford, New Britain, New Haven, Norwalk, Stafford, Stamford, Stratford and Waterbury.

TABLE 4

<u>SO2 TRENDS FROM CONTINUOUS DATA: 1978-1986</u>

(PAIRED *t* TEST)

PAIRED YEARS	NUMBER OF SITES	AVERAGE OF ANNUAL GEOMETRIC MEANS (µg/m3)	STANDARD DEVIATION (µg/m3)	SIGNIFICANCE LEVEL		
				TREND AT		PROBABILITY THAT CHANGE IS NOT SIGNIFICANT
				95% LEVEL	99% LEVEL	
78 79	9 9	23.8 21.3	6.1 5.3	N.C.	N.C.	0.1238
79 80	10 10	21.8 19.8	4.5 5.2	↓	N.C.	0.0215
80 81	8 8	21.1 20.9	4.1 4.4	N.C.	N.C.	0.9100
81 82	8 8	20.9 21.0	4.4 4.5	N.C.	N.C.	0.9522
82 83	8 8	20.0 18.1	5.0 5.1	↓	↓	0.0002
83 84	8 8	18.1 18.2	5.1 4.5	N.C.	N.C.	0.9237
84 85	~~15~~ 14 ~~15~~ 14	~~16.4~~ 16.3 ~~16.5~~ 16.7	~~4.4~~ 4.5 ~~4.9~~ 5.0	N.C.	N.C.	0.6753 ~~0.9654~~
85 86	~~16~~ 15 ~~16~~ 15	~~14.6~~ 14.9 ~~15.5~~ 15.7	5.3 4.4	N.C.	N.C.	0.4672 ~~0.3772~~

Key to Symbols : ↓ = Significant downward trend

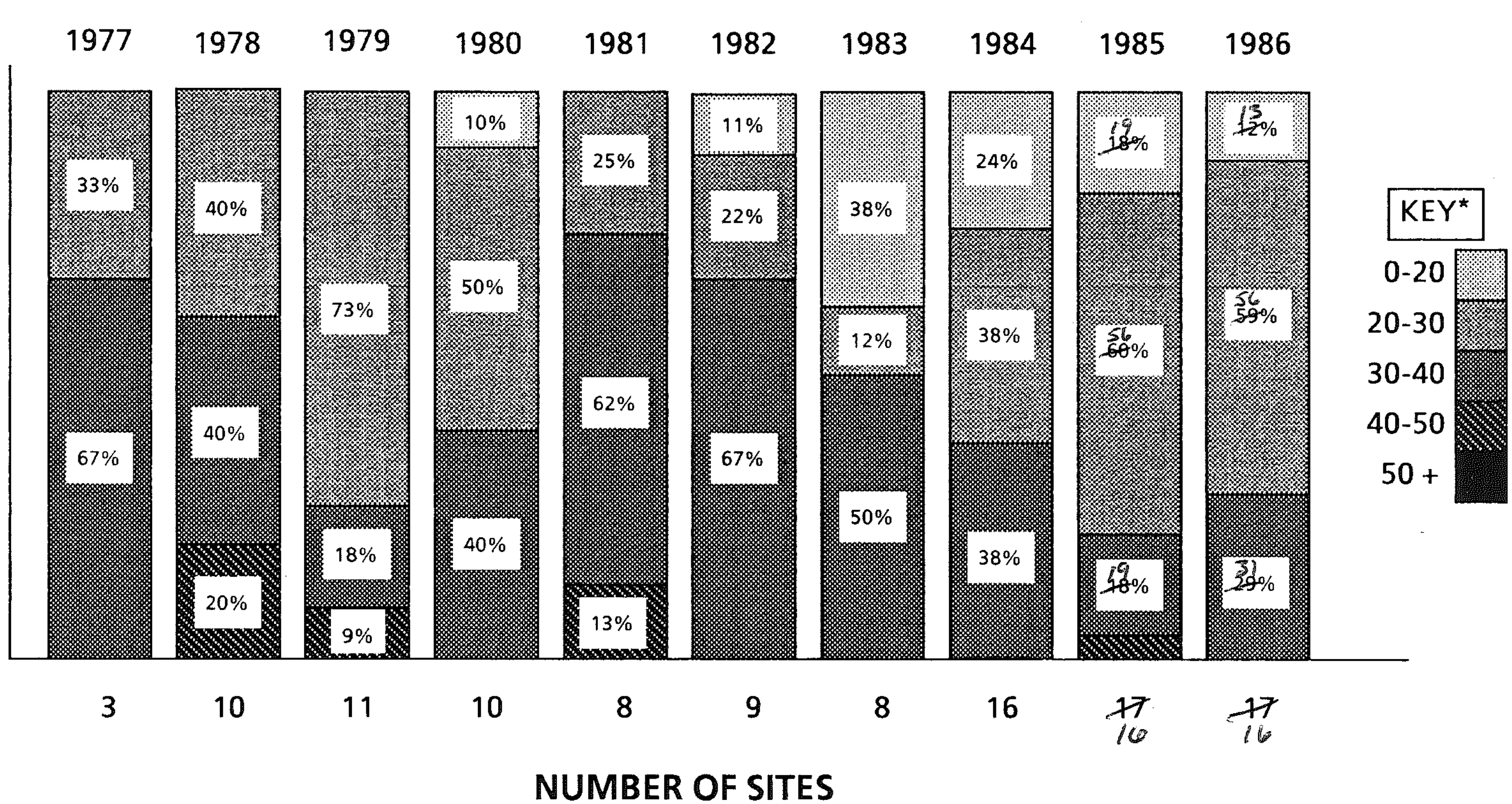
↑ = Significant upward trend

N.C. = No significant change

FIGURE 2

SULFUR DIOXIDE TREND FROM CONTINUOUS DATA

"PERCENT OF SITES WITHIN EACH RANGE"



PRIMARY ANNUAL STANDARD = 80 μg/m³

* ANNUAL ARITHMETIC MEAN (μg/m³)

FIGURE 2A

ANNUAL GEOMETRIC MEAN CONCENTRATIONS OF SO2 (PPB) FOR 1981-1986 AT EACH OF FIVE CONCURRENTLY OPERATING SITES

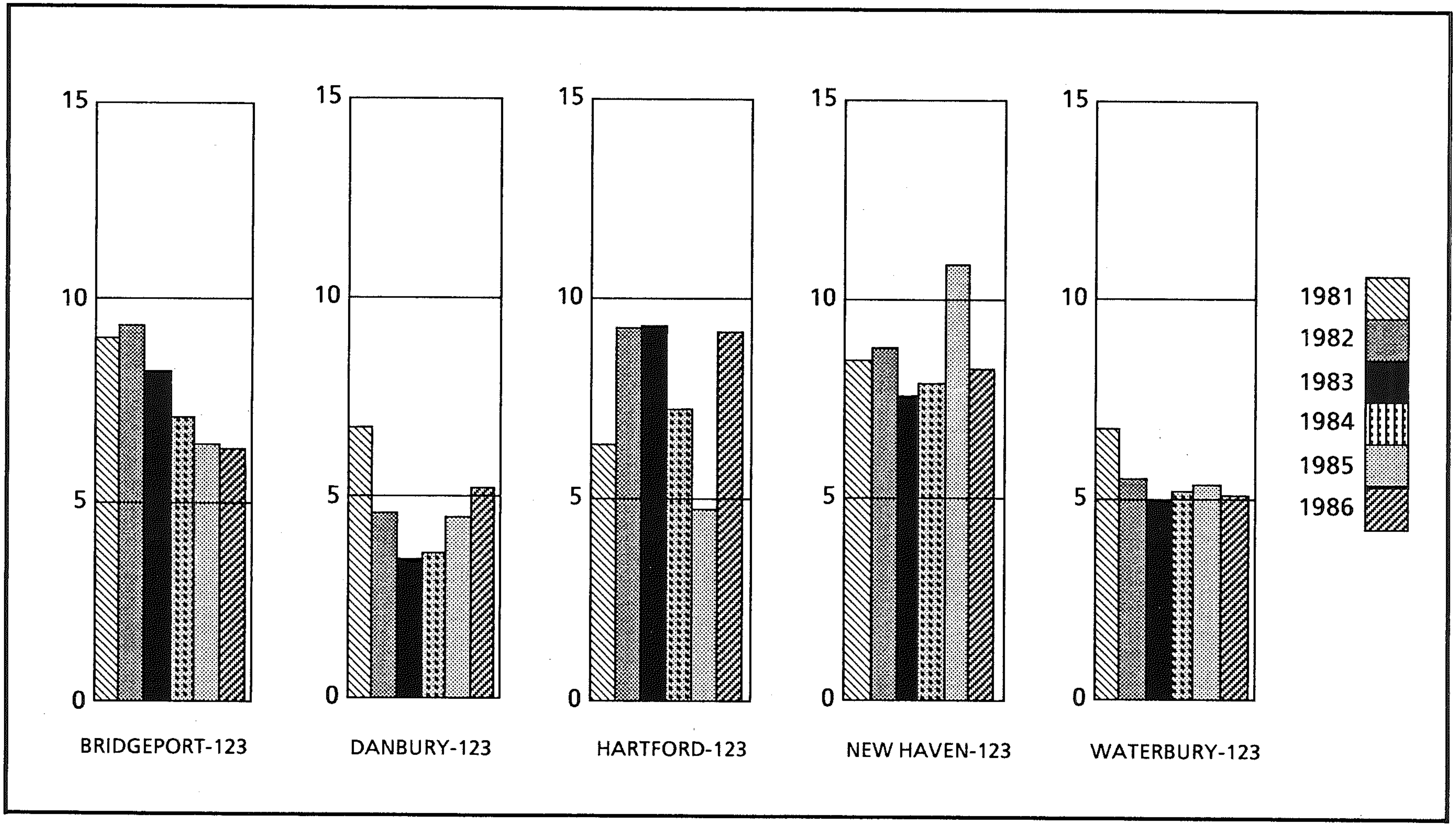


FIGURE 2B

THE AVERAGE OF THE ANNUAL GEOMETRIC MEAN SO2 CONCENTRATIONS FOR 1981-1986 AT FIVE CONCURRENTLY OPERATING SITES

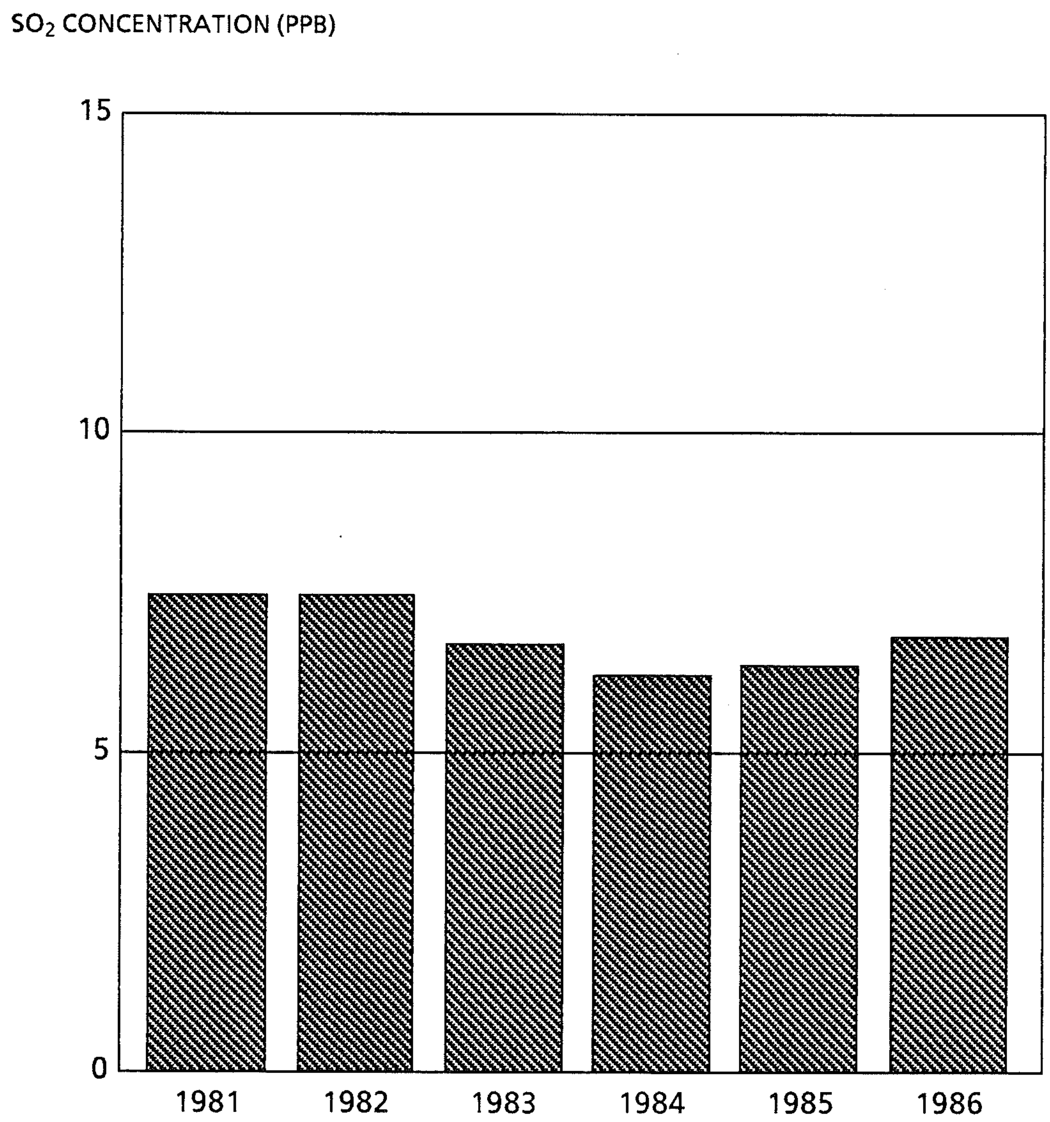


FIGURE 2C

THREE-YEAR RUNNING AVERAGES OF THE ANNUAL GEOMETRIC MEAN SO2 CONCENTRATIONS FOR 1981-1986 AT FIVE CONCURRENTLY OPERATING SITES

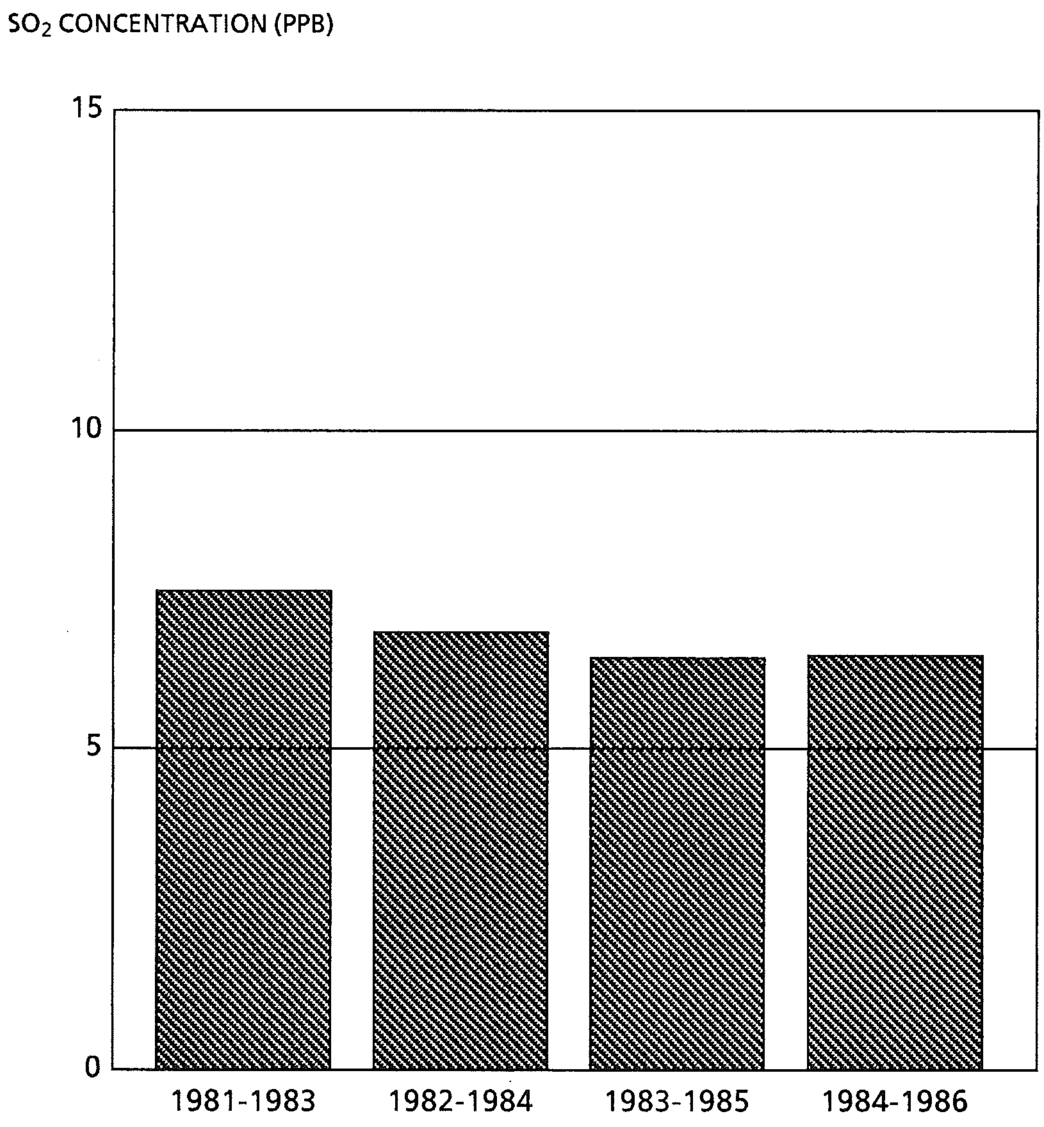
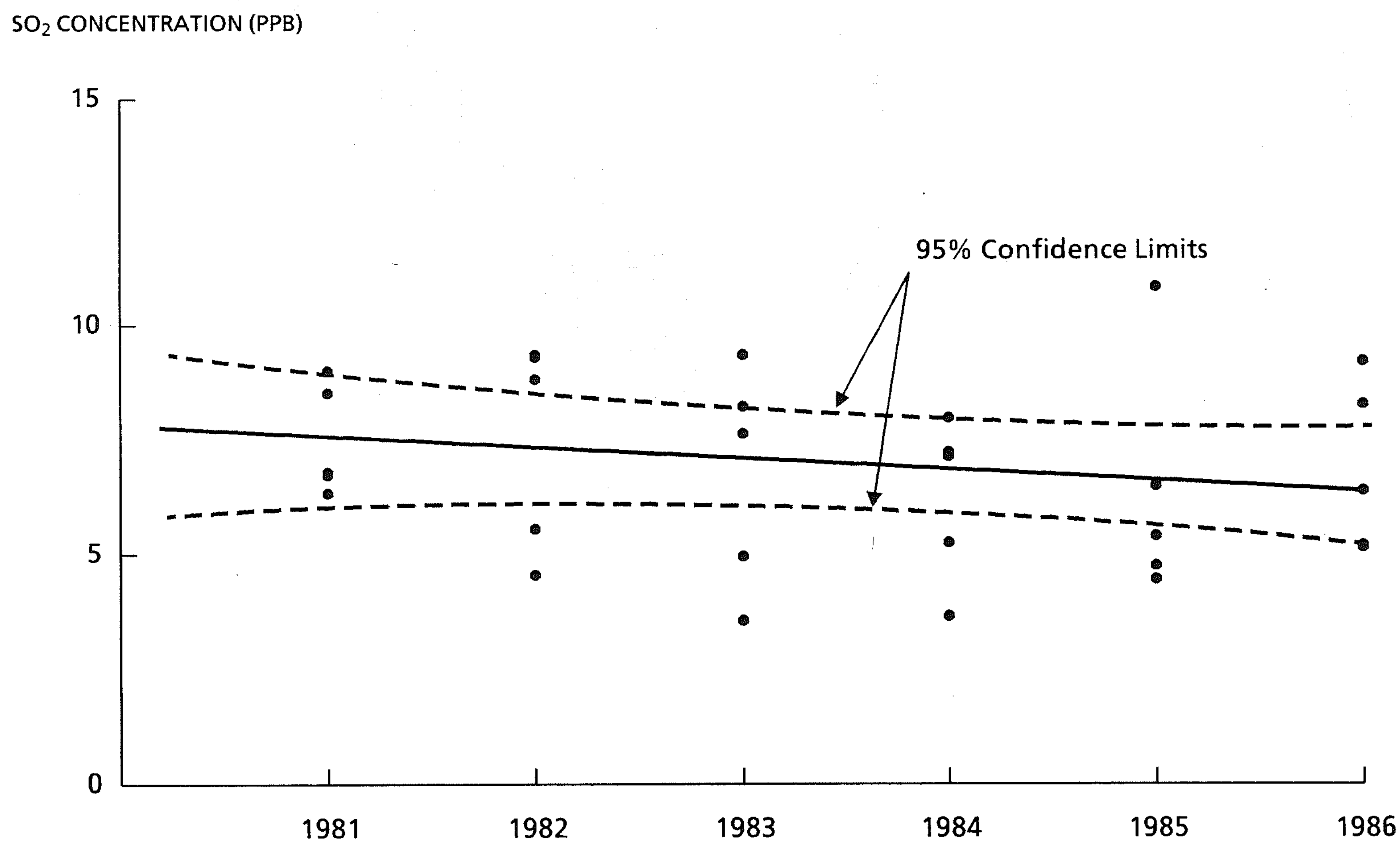


FIGURE 2D

TREND OF THE ANNUAL GEOMETRIC MEAN SO2 CONCENTRATIONS FOR 1981-1986 AT FIVE CONCURRENTLY OPERATING SITES



Continuously measured parameters include the pollutants sulfur dioxide, particulates (measured as the coefficient of haze), carbon monoxide, nitrogen dioxide and ozone. Meteorological data consists of wind speed and direction, wind horizontal sigma, temperature, dew point, precipitation, barometric pressure and solar radiation (insolation).

The real-time capabilities of the Data General telemetry network have enabled the Air Monitoring Unit to report the Pollutant Standards Index for a number of towns on a daily basis while continuously keeping a close watch for high pollution levels which may occur during adverse weather conditions.

The complete monitoring network used in 1986 consisted of:

- 40 Total suspended particulate hi-vol sites
- 14 Lead hi-vol sites
- 6 Lead lo-vol sites
- 18 Sulfur dioxide sites
- 10 Ozone sites
- 3 Nitrogen dioxide sites
- 5 Carbon monoxide sites

A complete description of all permanent air monitoring sites in Connecticut operated by DEP in 1986 is available from the Department of Environmental Protection, Air Compliance Unit, Monitoring Section, State Office Building, Hartford, Connecticut, 06106.

D. POLLUTANT STANDARDS INDEX

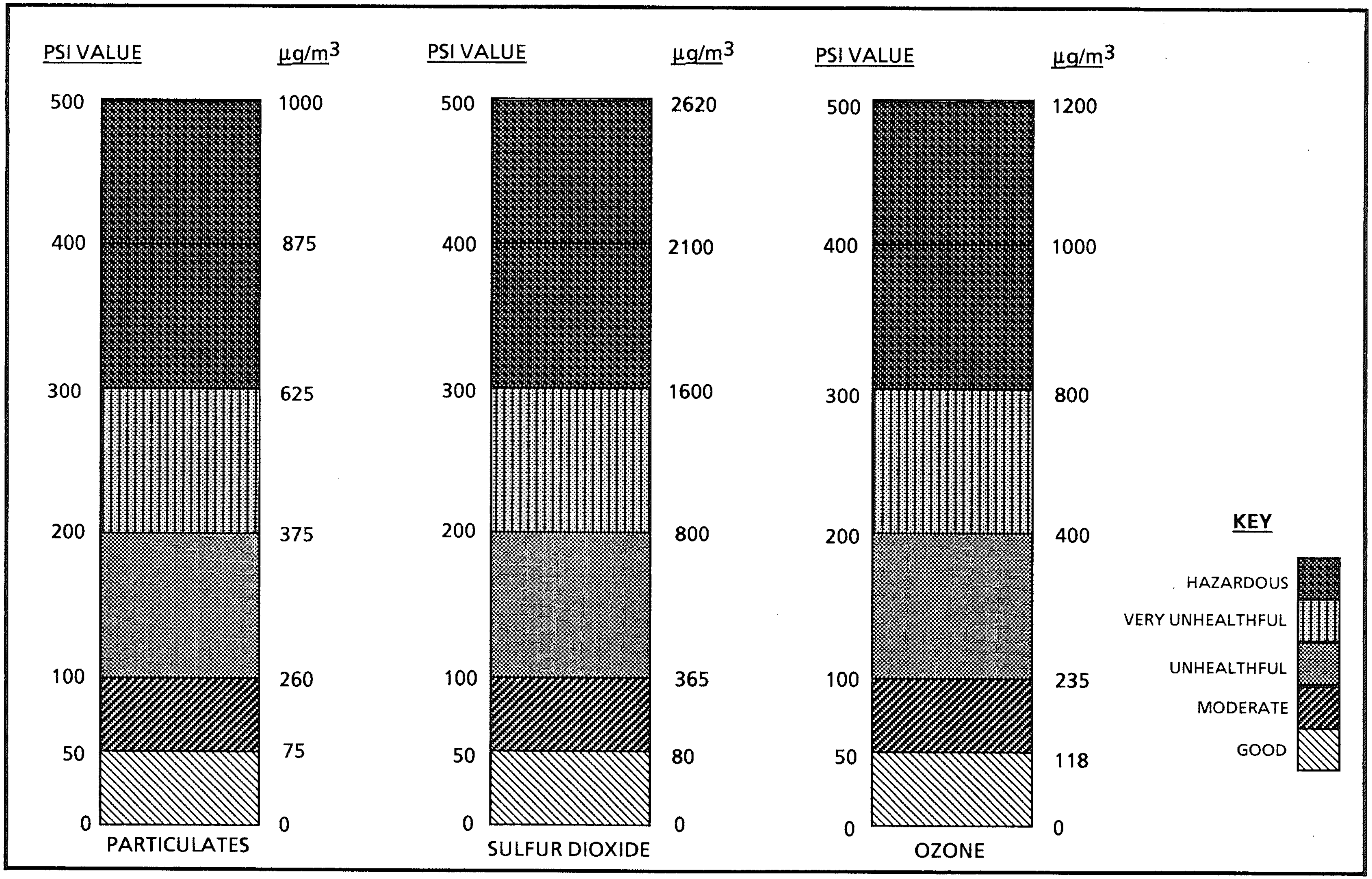
The Pollutant Standards Index (PSI) is a daily air quality index recommended for common use in state and local agencies by the U.S. Environmental Protection Agency. Starting on November 15, 1976, Connecticut began reporting the PSI on a 7-day basis, but is currently reporting the PSI on a 5-day basis. The PSI incorporates three pollutants : sulfur dioxide, total suspended particulates and ozone. The index converts each air pollutant concentration into a normalized number where the National Ambient Air Quality Standard for each pollutant corresponds to PSI = 100 and the Significant Harm Level corresponds to PSI = 500.

Figure 3 shows the breakdown of index values for the commonly reported pollutants (TSP, SO_2, and O_3) in Connecticut. For the winter of 1986, Connecticut reported the total suspended particulate PSI for the towns of Bridgeport, Danbury, Greenwich, Groton, Hartford, Meriden, Milford, New Britain, New Haven, Norwalk, Norwich, Stamford, Wallingford, and Waterbury; and reported the sulfur dioxide PSI for the towns of Bridgeport, Danbury, East Hartford, Enfield, Greenwich, Groton, Hartford, Milford, New Britain, New Haven, Norwalk, Stamford, and Waterbury. For the summer, the ozone PSI was reported for the towns of Bridgeport, Danbury, East Hartford, Greenwich, Groton, Madison, Middletown, New Haven, Stafford, and Stratford. Each day, the pollutant with the highest PSI value of all the pollutants being monitored is reported for each town, along with the dimensionless PSI number and a descriptor word to characterize the daily air quality.

A telephone recording of the PSI is taped each afternoon at approximately 3 PM, five days a week, and can be heard by dialing 566-3449. Predictions for weekends are included on the Friday recordings. For residents outside of the Hartford telephone exchange, the PSI is now available toll-free from the DEP representative at the Governor's State Information Bureau. The number is 1-800-842-2220. This information is also available to the public during weekday afternoons from the American Lung Association of Connecticut in East Hartford. The number there is 289-5401 or 1-800-992-2263.

FIGURE 3

POLLUTANT STANDARDS INDEX



E. QUALITY ASSURANCE

Quality Assurance requirements for State and Local Air Monitoring Stations (SLAMS) and the National Air Monitoring Stations (NAMS), as part of the (SLAMS) network, are specified by the code of Federal Regulations, Title 40, Part 58, Appendix A.

The regulations were enacted to provide a consistent approach to Quality Assurance activities across the country so that ambient data with a defined precision and accuracy is produced.

A Quality Assurance program was initiated in Connecticut with written procedures covering, but not limited to, the following:

Equipment procurement
Equipment installation
Equipment calibration
Equipment operation
Sample analysis
Maintenance audits
Performance audits
Data handling and assessment

Quality assurance procedures for the above activities were fully operational on January 1, 1981 for all NAMS monitoring sites. On January 1, 1983 the above procedures were fully operational for all SLAMS monitoring sites.

Data precision and accuracy values are reported in the form of 95% probability limits as defined by equations found in Appendix A of the Federal regulations cited above.

1. PRECISION

Precision is a measure of data repeatability (grouping) and is determined in the following manner:

a. Manual Samplers (TSP)

A second (co-located) TSP hi-vol sampler is placed alongside a regular TSP network sampler and operated concurrently. The concentration values from the co-located hi-vol sampler are compared to the network sampler and precision values are generated from the comparison.

b. Manual Samplers (Lead)

Duplicate strips are cut from the hi-vol sampler filters and individually analyzed for lead. The resulting concentration values are compared, and precision values are generated from the comparison.

c. Automated Analyzers (SO_2,O_3,CO and NO_2)

All NAMS and SLAMS analyzers are challenged with a low level pollutant concentration a minimum of once every two weeks: 0.08 to 0.10 ppm for SO_2, O_3

and NO_2, and 8 to 10 ppm for CO. The comparison of analyzer response to input concentration is used to generate automated analyzer precision values.

2. ACCURACY

Accuracy is an estimate of the closeness of a measured value to a known value and is determined in the following manner:

a. Manual Methods (TSP)

TSP accuracy is assessed by auditing the flow measurement phase of the TSP sampling method. In Connecticut, this is accomplished by attaching a secondary standard calibrated orifice to the hi-vol inlet and comparing the flow rates. A minimum of 25% of the TSP network samplers are audited each quarter.

b. Manual Methods (Lead)

Lead accuracy is assessed by analyzing spiked audit strips and comparing the analyzed results to the known spiked values. A low- and a high-valued spike are analyzed during lead filter processing -- approximately once per month.

c. Automated Analyzers (SO_2, O_3, CO and NO_2)

Automated analyzer data accuracy is determined by challenging each analyzer with three predetermined concentration levels. Accuracy values are calculated for a number of analyzers, in a pollutant sampling network, at each concentration level. Automated analyzer response is audited at three concentration levels and zero. The results for each concentration for a particular pollutant are used to assess automated analyzer accuracy. The audit concentration levels are as follows:

SO_2, O_3, and NO_2 (PPM)	**CO** (PPM)
0.03 to 0.08	3 to 8
0.15 to 0.20	15 to 20
0.35 to 0.45	35 to 45
0.80 to 0.90 (NO_2 only)	

II. TOTAL SUSPENDED PARTICULATES

HEALTH EFFECTS

Particulates are solid particles or liquid droplets small enough to remain suspended in air. They include dust, soot, and smoke -- particles that may be irritating but are usually not poisonous -- and bits of solid or liquid substances that may be highly toxic. The smaller the particles, the more likely they are to reach the innermost parts of the lungs and work their damage.

The harm may be physical: clogging the lung sacs, as in anthracosis, or coal miners' "black lung" from inhaling coal dust; asbestosis or silicosis in people exposed to asbestos fibers or dusts from silicate rocks; and byssinosis, or textile workers' "brown lung" from inhaling cotton fibers.

The harm may also be chemical: changes in the human body caused by chemical reactions with pollution particles that pass through the lung membranes to poison the blood or be carried by the blood to other organs. This can happen with inhaled lead, cadmium, beryllium, and other metals, and with certain complex organic compounds that can cause cancer.

Many studies indicate that particulates and sulfur oxides (they often occur together) increase the incidence and severity of respiratory disease.

CONCLUSIONS

Measured TSP levels did not exceed the primary annual standard of 75 $\mu g/m^3$ or the secondary annual standard of 60 $\mu g/m^3$ during 1986. Nor did any site have a measured concentration exceeding the primary 24-hour standard of 260 $\mu g/m^3$ or the secondary 24-hour standard of 150 $\mu g/m^3$.

SAMPLE COLLECTION AND ANALYSIS

High Volume Sampler (Hi-vol) - "Hi-vols" resemble vacuum cleaners in their operation, with an 8" x 10" piece of fiberglass filter paper replacing the vacuum bag. Retractable lids have been installed on the hi-vols in order to eliminate the passive sampling error. The samplers operate (from midnight to midnight) every sixth day at all sites.

The matter collected on the filters is analyzed for weight and chemical composition. The air flow through the filter is recorded during sampling. The weight in micrograms (μg) divided by the volume of air in cubic meters (m^3) yields the pollutant concentration for the day, in micrograms per cubic meter.

The chemical composition of the suspended particulate matter is determined at each hi-vol site as follows. Three standardized strips of every hi-vol filter are cut out and prepared for three different analyses. In the first analysis, a composite sample composed of a strip from each of several filters collected in a quarter-year is digested in acid, and the resulting solution is analyzed for metals by means of an atomic absorption spectrophotometer. The results are reported for each individual metal in $\mu g/m^3$. In the second analysis, a composite sample is dissolved in water, filtered and the resulting solution is analyzed by means of wet chemistry techniques to determine the concentration of the particular water soluble components. The results are reported for each individual constituent of the water soluble fraction in $\mu g/m^3$. In the third analysis, total sulfates are determined by means of the same procedure used in the second analysis, but each sample collected in the quarter-year is analyzed individually and the results from all the samples are averaged (see Table 9). Before 1983, composite, rather than individual, samples were used to determine total sulfates.

Low Volume Sampler (Lo-vol) - The low volume sampler is a 30-day continuous sampler. It is enclosed in a shelter similar to a hi-vol, uses the same glass fiber filter paper, but operates at an air sampling flow rate approximately one-tenth that used by a standard hi-vol (i.e., 4 cfm as opposed to 40-60 cfm). The air flow through the lo-vol is measured by a temperature compensating dry gas meter. The lo-vol measurement is essentially an arithmetic average for the 30-day sampling interval. The filters are chemically analyzed in the same manner as those from the hi-vol sampler.

It should be noted that in 1985 the methods used to analyze the water soluble components of both the hi-vol and lo-vol filters were updated to reflect the latest available technology. Consequently, the accuracy of the analysis methods increased, and the resulting quarterly and monthly concentrations of ammonium, nitrate and sulfate were significantly higher than their counterparts in previous years. This is especially true for sulfate.

DISCUSSION OF DATA

Monitoring Network - In 1986, 40 hi-vol and 2 lo-vol particulate samplers were operated in Connecticut (see Figure 4). Because the Federal EPA does not recognize the lo-vol instrument as an equivalent to the reference (hi-vol) method of sampling for TSP, only hi-vol data are analyzed for compliance with the National Ambient Air Quality Standards (NAAQS).

Precision and Accuracy - Precision checks were conducted at three hi-vol sampling sites which had co-located samplers. On the basis of 172 precision checks, the 95% probability limits for precision ranged from -10% to +8%. Accuracy is based on air flow through the monitor. The 95% probability limits for accuracy, based on 81 audits conducted on the hi-vol monitoring system network, ranged from -4% to +5%. (See section I.E. of this Air Quality Summary for a discussion of precision and accuracy.)

Annual Averages - The Federal EPA has established minimum sampling criteria (see Table 1) for use in determining compliance with either the primary or secondary annual NAAQS for TSP. Using the EPA criteria, one finds that neither the primary annual standard nor the secondary annual standard was exceeded in Connecticut in 1986. Of the 39 sites that had valid annual geometric means (as determined by EPA minimum sampling criteria) in both 1985 and 1986, 33 sites had lower annual geometric means when compared to 1985. Of the 6 sites whose annual geometric means increased, the highest increase was 4.9 $\mu g/m^3$ at the Norwalk 005 site (see Table 5).

Historical Data - A summary of annual average TSP data for 1984-1986 is presented in Table 5. For data going back to 1957, see the 1980 and 1983 editions of the Air Quality Summary. Table 5 also includes an indication of whether the aforementioned EPA minimum sampling criteria were met at each site for each year. If the sampling was insufficient to meet the EPA criteria, an asterisk appears next to the number of samples.

Statistical Projections - The statistical projections presented in Table 5 are prepared by a DEP computer program which analyzes data from all sites operated by DEP. Input to the program includes site location and year, the number of samples (usually a maximum of 61), the annual geometric mean concentration and the geometric standard deviation. The program lists the input and calculates the 95% confidence limits about the mean and the statistical projections of the number of days in each year the primary and secondary 24-hour NAAQS would have been exceeded if sampling had been conducted every day. This analysis, like the ambient standards, is based on the assumption that the particulate data are log-normally distributed. For comparison, Table 5 also shows the number of days at a site when the secondary 24-hour standard of 150 $\mu g/m^3$ was exceeded, as demonstrated by actual measurements at the site.

The statistical projections in Table 5 indicate that more frequent TSP sampling in 1986 might have resulted in measured violations (i.e., two or more exceedances) of the secondary 24-hour standard at Danbury 123, Hartford 003, Meriden 002, Middletown 003, Naugatuck 001, New Haven 002, Norwalk 005, Stratford 005, Torrington 001, Wallingford 001, Waterbury 005, Waterbury-007 and Willimantic 002. Statistical projections regarding the primary 24-hour standard of 260 $\mu g/m^3$ are omitted from the table because there were no predicted and no measured exceedances of this standard at any site.

Because manpower and economic limitations dictate that hi-vol sampling for particulate matter cannot be conducted every day, a degree of uncertainty is introduced as to whether the air quality at a site has either met or exceeded the national standards. This uncertainty for the annual standard can be quantified by determining 95% confidence limits about each of the annual geometric means. For example (see Table 5), at Hartford 003 in 1985, 58 samples were analyzed and a geometric mean of 50.8 $\mu g/m^3$ was then calculated. The columns labeled "95-PCT-LIMITS" show the lower and upper limits of the 95% confidence interval to be 46 and 55 $\mu g/m^3$, respectively. This means that, if a larger sample set (i.e., greater than 58 samples) were collected in 1985 at this site, there is a 95% chance that the geometric mean would fall between these limits. If the upper limit happened to be less than 60 $\mu g/m^3$, the national ambient secondary standard for particulates, then one could be confident that the secondary standard was met at the site. If the upper limit happened to be greater, and the lower limit less, than 60 $\mu g/m^3$, then one could not be confident that the secondary standard was met at the site. If both the upper and lower limits were greater than 60 $\mu g/m^3$, then one could be confident that the standard was exceeded. These three possibilities are illustrated in Table X.

In Table 6, one can examine the 1986 monitoring sites for compliance with air quality standards, using the State's hi-vol confidence limit criteria. The table shows that the DEP is confident that the primary annual standard and the secondary annual standard were achieved at all 40 sites.

24-Hour Averages - Table 7 presents the first and second high 24-hour concentrations recorded at each site. There were no violations (i.e., less than two exceedances) of the primary 24-hour standard and no violations of the secondary 24-hour standard at any site in Connecticut in 1986, which was also the case in 1985. The second high 24-hour average increased at 31 of the 39 sites which met the minimum EPA sampling criteria in both 1985 and 1986. Ten (10) of these increases were greater than or equal to 20 $\mu g/m^3$. The second high 24-hour average decreased at 7 of the sites, and 4 of these decreases were greater than or equal to 25 $\mu g/m^3$.

Table 8 summarizes the statistical predictions from Table 5 regarding the number of days exceeding the 24-hour standards. If sampling had been conducted every day in 1986, there would have been no site with a violation of the primary 24-hour standard. However, 13 sites are predicted to have violations of the secondary 24-hour standard. This represents a significant increase over the previous three years.

Hi-vol Averages - Quarterly and annual averages of fourteen chemical components or characteristics of the particulate matter collected at each hi-vol sampling location have been computed for the year 1986 and are presented in Table 9.

Lo-vol Averages - For a number of years, the DEP has been experimenting and gathering data with the lo-vol particulate monitor. Lo-vols, which operate continuously for one month, have three advantages and one disadvantage in relation to hi-vols. First, the lo-vol's continuous operation can provide annual averages which include every day of the year, rather than the fractional portion of the year sampled by hi-vols every sixth day. Second, the lo-vol needs less frequent servicing (12 times/year) than the hi-vol (61 times/year for every-sixth-day sampling). Therefore, it is more cost-effective to operate. Third, the lo-vol has a higher collection efficiency than the hi-vol, especially for small, respirable particles. The disadvantage of the lo-vol is that it does not provide daily samples for direct comparison to the 24-hour TSP standards (although 24-hour averages can be obtained by statistical interpolation).

The two lo-vol sites are located at rural locations. One site is in Mansfield and the other is in Putnam. The use of the lo-vols made it possible to continue to obtain data on annual average particulate levels at these rural sites.

Monthly and annual averages of the chemical components from the lo-vol TSP monitors have been computed for 1986 and are presented in Table 10.

10 High Days with Wind Data - Table 11 lists the 10 highest 24-hour average TSP readings with the dates of occurrence for each TSP hi-vol site in Connecticut during 1986. This table also shows the average wind conditions which occurred on each of these dates. The resultant wind direction (DIR, in compass degrees clockwise from north) and velocity (VEL, in mph), the average wind speed (SPD, in mph), and the ratio between the velocity and the speed are presented for each of four National Weather Service stations located in or near Connecticut. The resultant wind direction and velocity are vector quantities and are computed from the individual wind direction and speed readings in each day. The closer the wind speed ratio is to 1.000, the more persistent the wind. Note that the Connecticut stations have local influences which change the speed and shift the direction of the near-surface air flow (e.g., the Bradley Field air flow is channeled north-south by the Connecticut River Valley and the Bridgeport air flow is frequently subject to sea breezes).

On a statewide basis, this table shows that approximately 63% of the high TSP days occur with winds out of the southwest quadrant and most of those days have relatively persistent winds. This relationship between southwest winds and high TSP levels is more prevalent in southwestern Connecticut. However, many of the maximum levels at some urban sites do not occur with southwest winds, indicating that these sites are possibly influenced by local sources or transport from different out-of-state sources. As noted above, a large scale southwesterly air flow is often diverted into a southerly flow up the Connecticut River Valley. At many sites in the Connecticut River Valley most of the highest TSP days occur when the winds at Bradley Airport are from the south.

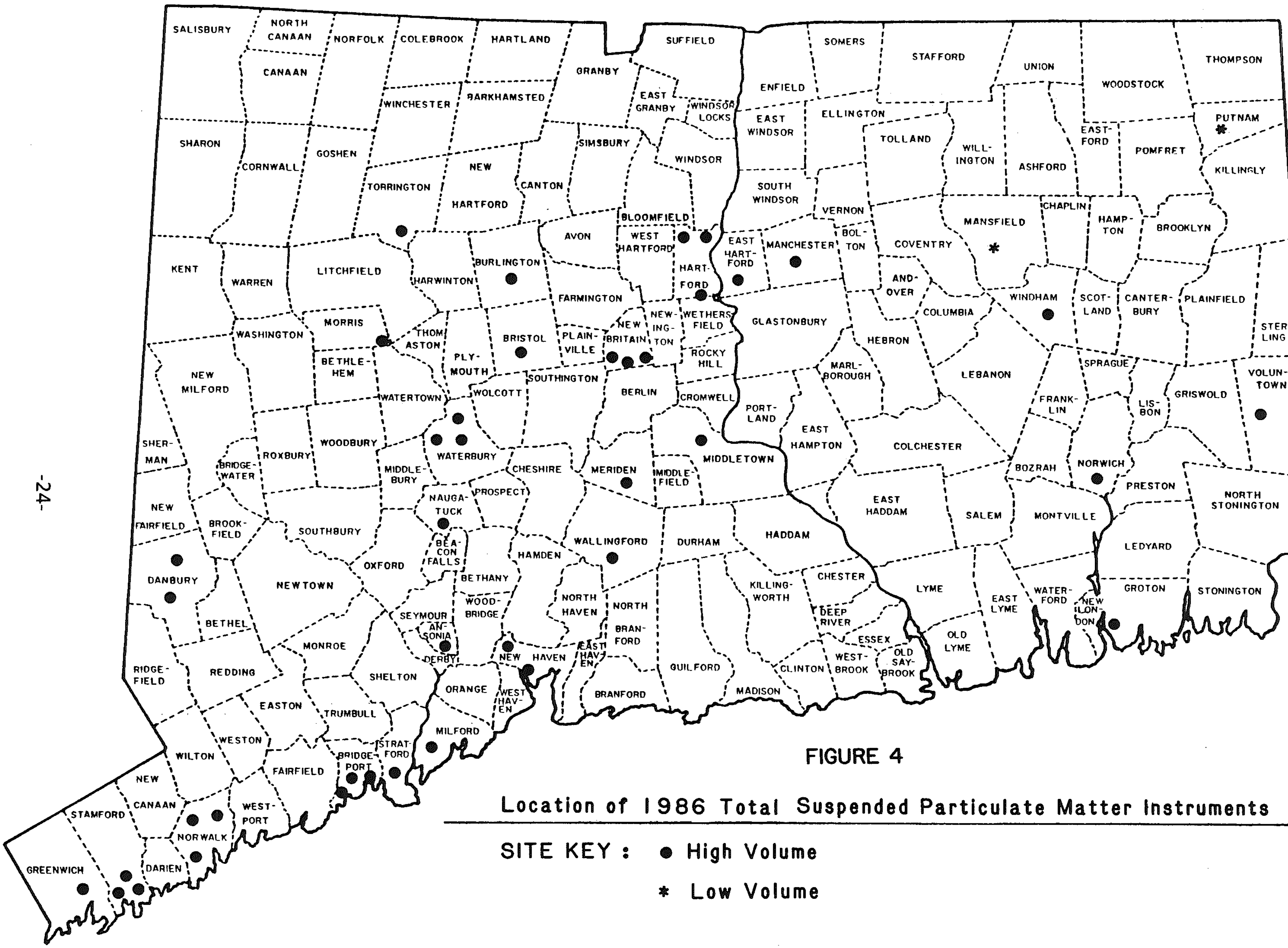


FIGURE 4

Location of 1986 Total Suspended Particulate Matter Instruments

SITE KEY : ● High Volume

* Low Volume

TABLE 5

1984-1986 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

DISTRIBUTION--LOGNORMAL

TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	GEOM STD DEV	PREDICTED DAYS OVER 150 UG/M3	MEASURED DAYS OVER 150 UG/M3
ANSONIA	003	1984	60	42.7	39	47	1.503		
ANSONIA	004	1985	59	39.4	35	44	1.612	1	
ANSONIA	004	1986	59	36.6	32	42	1.699	1	
BRIDGEPORT	001	1984	58	42.8	39	47	1.422		
BRIDGEPORT	001	1985	59	43.0	39	47	1.479		
BRIDGEPORT	001	1986	61	40.4	37	45	1.529		
BRIDGEPORT	009	1984	58	41.6	37	46	1.556	1	
BRIDGEPORT	009	1985	57	39.7	35	45	1.615	1	
BRIDGEPORT	009	1986	59	37.5	34	42	1.571		
BRIDGEPORT	123	1984	57	52.6	48	58	1.514	2	
BRIDGEPORT	123	1985	57	59.6	53	67	1.586	8	
BRIDGEPORT	123	1986	59	48.5	44	54	1.528	1	
BRISTOL	001	1984	56	34.5	31	39	1.554		
BRISTOL	001	1985	60	36.4	33	40	1.487		
BRISTOL	001	1986	58	39.3	35	44	1.655	1	
BURLINGTON	001	1984	58	20.6	18	24	1.778		
BURLINGTON	001	1985	59	20.1	18	22	1.589		
BURLINGTON	001	1986	58	18.0	16	21	1.837		
DANBURY	002	1984	57	43.8	39	49	1.537	1	
DANBURY	002	1985	61	44.3	41	48	1.445		
DANBURY	002	1986	57	43.4	39	49	1.579	1	
DANBURY	123	1984	57	42.8	38	48	1.624	2	
DANBURY	123	1985	58	43.3	39	48	1.552	1	
DANBURY	123	1986	60	42.9	38	48	1.648	2	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE GEOMETRIC MEAN HAS UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 5, CONTINUED

1984-1986 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

DISTRIBUTION--LOGNORMAL

TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	GEOM STD DEV	PREDICTED DAYS OVER 150 UG/M3	MEASURED DAYS OVER 150 UG/M3
EAST HARTFORD	004	1984	57	41.2	37	46	1.507		
EAST HARTFORD	004	1985	57	41.9	38	46	1.522		
EAST HARTFORD	004	1986	60	40.7	36	46	1.608	1	
GREENWICH	008	1984	61	40.9	37	45	1.450		
GREENWICH	008	1985	60	43.8	39	49	1.576	1	
GREENWICH	008	1986	59	36.7	33	41	1.510		
GROTON	006	1984	56	37.3	33	42	1.659	1	
GROTON	006	1985	59	34.1	31	38	1.533		
GROTON	006	1986	61	32.3	29	36	1.537		
HADDAM	002	1984	60	27.9	25	31	1.554		
HARTFORD	003	1984	60	48.3	44	53	1.509	1	
HARTFORD	003	1985	58	50.8	46	55	1.442		
HARTFORD	003	1986	57	50.4	45	56	1.537	2	
HARTFORD	013	1984	57	44.2	40	49	1.539	1	
HARTFORD	013	1985	46*	42.5	38	48	1.531		
HARTFORD	013	1986	60	44.6	40	50	1.559	1	
HARTFORD	014	1984	60	41.7	38	46	1.519		
HARTFORD	014	1985	58	43.7	40	48	1.453		
HARTFORD	014	1986	61	41.8	38	46	1.542	1	
MANCHESTER	001	1984	60	31.4	28	35	1.552		
MANCHESTER	001	1985	55	35.1	31	39	1.565		
MANCHESTER	001	1986	60	34.7	31	39	1.664	1	
MERIDEN	002	1984	60	42.4	38	47	1.510		
MERIDEN	002	1985	59	44.9	41	50	1.519	1	
MERIDEN	002	1986	60	45.1	40	51	1.655	3	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE GEOMETRIC MEAN HAS UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 5, CONTINUED

1984-1986 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

								DISTRIBUTION--LOGNORMAL	
					95-PCT-LIMITS			PREDICTED	MEASURED
TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	LOWER	UPPER	GEOM STD DEV	DAYS OVER 150 UG/M3	DAYS OVER 150 UG/M3
MIDDLETOWN	003	1984	55	38.8	35	43	1.509		
MIDDLETOWN	003	1985	57	41.7	38	46	1.481		
MIDDLETOWN	003	1986	56	44.4	39	50	1.627	2	
MILFORD	002	1984	61	40.8	37	45	1.460		
MILFORD	002	1985	60	44.9	41	49	1.472		
MILFORD	002	1986	58	40.9	37	45	1.527		
MORRIS	001	1984	15*	27.0	22	33	1.483		
MORRIS	001	1985	60	25.6	23	29	1.586		
MORRIS	001	1986	61	21.9	19	25	1.857		
NAUGATUCK	001	1984	59	41.4	37	46	1.562	1	
NAUGATUCK	001	1985	60	45.2	41	50	1.574	2	
NAUGATUCK	001	1986	59	43.9	39	49	1.617	2	
NEW BRITAIN	007	1984	59	36.7	33	40	1.506		
NEW BRITAIN	007	1985	59	37.8	35	41	1.456		
NEW BRITAIN	007	1986	61	36.0	32	40	1.589		
NEW BRITAIN	008	1984	61	37.1	33	41	1.561		
NEW BRITAIN	008	1985	59	37.2	34	41	1.525		
NEW BRITAIN	008	1986	60	35.9	32	40	1.632	1	
NEW BRITAIN	009	1984	60	36.0	32	40	1.555		
NEW BRITAIN	009	1985	56	34.5	31	38	1.517		
NEW BRITAIN	009	1986	59	33.5	30	37	1.596		
NEW HAVEN	002	1984	54	45.5	41	51	1.523	1	
NEW HAVEN	002	1985	51	48.8	44	54	1.466	1	
NEW HAVEN	002	1986	51	42.7	38	49	1.644	2	
NEW HAVEN	013	1984	59	45.3	42	49	1.421		
NEW HAVEN	013	1985	55	44.1	40	48	1.451		
NEW HAVEN	013	1986	52	42.6	38	48	1.555	1	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE GEOMETRIC MEAN HAS UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 5, CONTINUED

1984-1986 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	GEOM STD DEV	DISTRIBUTION--LOGNORMAL PREDICTED DAYS OVER 150 UG/M3	MEASURED DAYS OVER 150 UG/M3
NORWALK	001	1984	57	41.8	38	46	1.506		
NORWALK	001	1985	50	41.5	37	46	1.527		
NORWALK	001	1986	60	37.6	34	42	1.566		
NORWALK	005	1984	57	45.6	42	50	1.475		
NORWALK	005	1985	57	46.4	42	51	1.502	1	
NORWALK	005	1986	53	51.3	45	58	1.645	5	
NORWALK	012	1984	60	40.9	37	45	1.500		
NORWALK	012	1985	59	41.1	37	45	1.466		
NORWALK	012	1986	56	39.4	35	44	1.603	1	
NORWICH	001	1984	20*	39.6	33	47	1.485		
NORWICH	002	1984	41*	45.2	40	51	1.514	1	
NORWICH	002	1985	54	43.4	39	49	1.567	1	1
NORWICH	002	1986	55	41.0	37	46	1.576	1	
STAMFORD	001	1984	58	45.4	41	51	1.600	2	
STAMFORD	001	1985	56	56.8	51	63	1.557	5	1
STAMFORD	001	1986	58	49.4	45	55	1.504	1	
STAMFORD	007	1984	59	44.8	41	49	1.423		
STAMFORD	007	1985	58	47.1	43	51	1.435		
STAMFORD	007	1986	57	46.0	41	51	1.538	1	
STAMFORD	021	1984	57	49.4	45	54	1.457		
STAMFORD	021	1985	53	44.8	41	49	1.411		
STAMFORD	021	1986	56	43.8	40	48	1.504		
STRATFORD	005	1984	60	44.1	40	49	1.502		
STRATFORD	005	1985	58	44.2	40	49	1.566	1	
STRATFORD	005	1986	59	43.8	39	49	1.614	2	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE GEOMETRIC MEAN HAS UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 5, CONTINUED

1984-1986 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

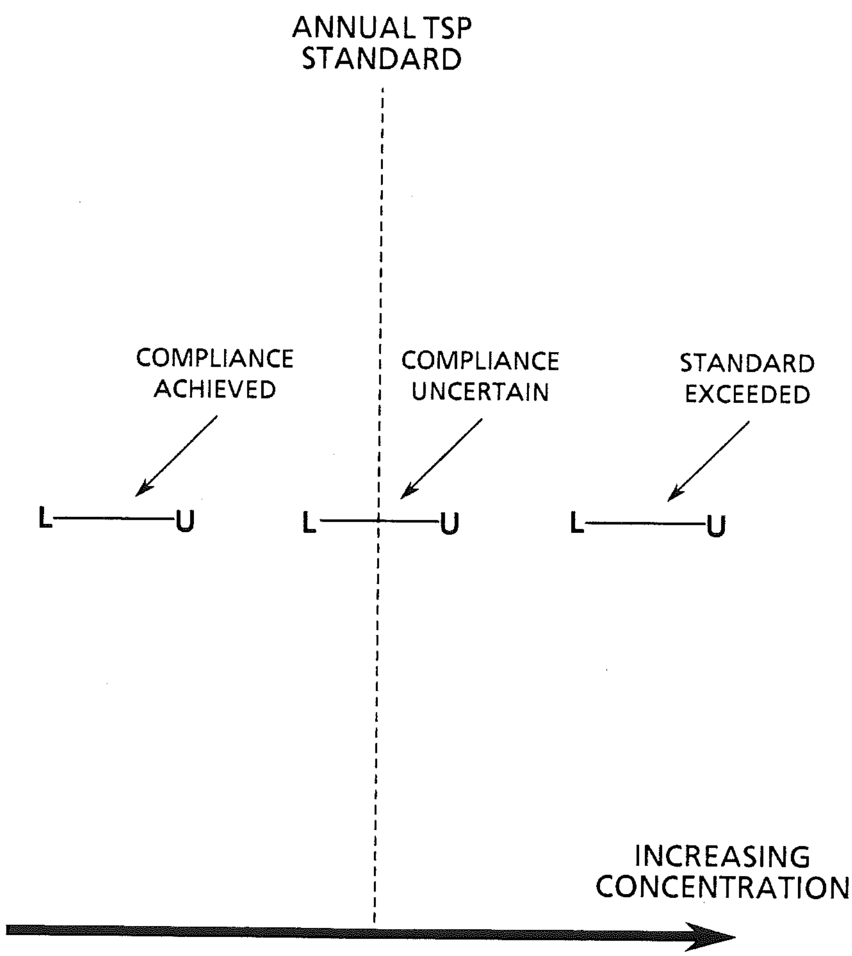
TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	GEOM STD DEV	DISTRIBUTION--LOGNORMAL PREDICTED DAYS OVER 150 UG/M3	MEASURED DAYS OVER 150 UG/M3
TORRINGTON	001	1984	61	38.0	34	43	1.637	1	
TORRINGTON	001	1985	60	37.6	34	42	1.613	1	
TORRINGTON	001	1986	60	36.8	32	42	1.763	2	
VOLUNTOWN	001	1984	59	23.2	21	26	1.618		
VOLUNTOWN	001	1985	56	23.3	21	26	1.495		
VOLUNTOWN	001	1986	60	21.0	18	24	1.701		
WALLINGFORD	001	1984	60	43.1	39	48	1.556	1	
WALLINGFORD	001	1985	59	43.1	39	48	1.597	1	
WALLINGFORD	001	1986	60	41.5	36	47	1.759	4	
WATERBURY	005	1984	57	41.4	37	46	1.541		
WATERBURY	005	1985	56	42.8	38	48	1.567	1	
WATERBURY	005	1986	61	43.3	38	49	1.686	3	
WATERBURY	006	1984	59	37.1	33	41	1.558		
WATERBURY	006	1985	59	35.7	32	39	1.502		
WATERBURY	006	1986	57	33.3	29	38	1.674	1	
WATERBURY	007	1984	59	47.5	43	53	1.545	2	
WATERBURY	007	1985	60	50.6	45	56	1.581	3	
WATERBURY	007	1986	60	50.4	44	57	1.697	7	
WATERFORD	001	1984	58	29.3	26	33	1.693		
WILLIMANTIC	002	1984	61	37.6	34	41	1.491		
WILLIMANTIC	002	1985	60	37.3	34	41	1.559		
WILLIMANTIC	002	1986	57	39.5	35	45	1.700	2	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE GEOMETRIC MEAN HAS UNITS OF MICROGRAMS PER CUBIC METER.

FIGURE X

COMPLIANCE WITH THE ANNUAL TSP STANDARDS USING 95% CONFIDENCE LIMITS ABOUT THE ANNUAL GEOMETRIC MEAN CONCENTRATION



L = The lower limit of the 95% confidence interval about the annual geometric mean concentration.

U = The upper limit of the 95% confidence interval about the annual geometric mean concentration.

TABLE 6

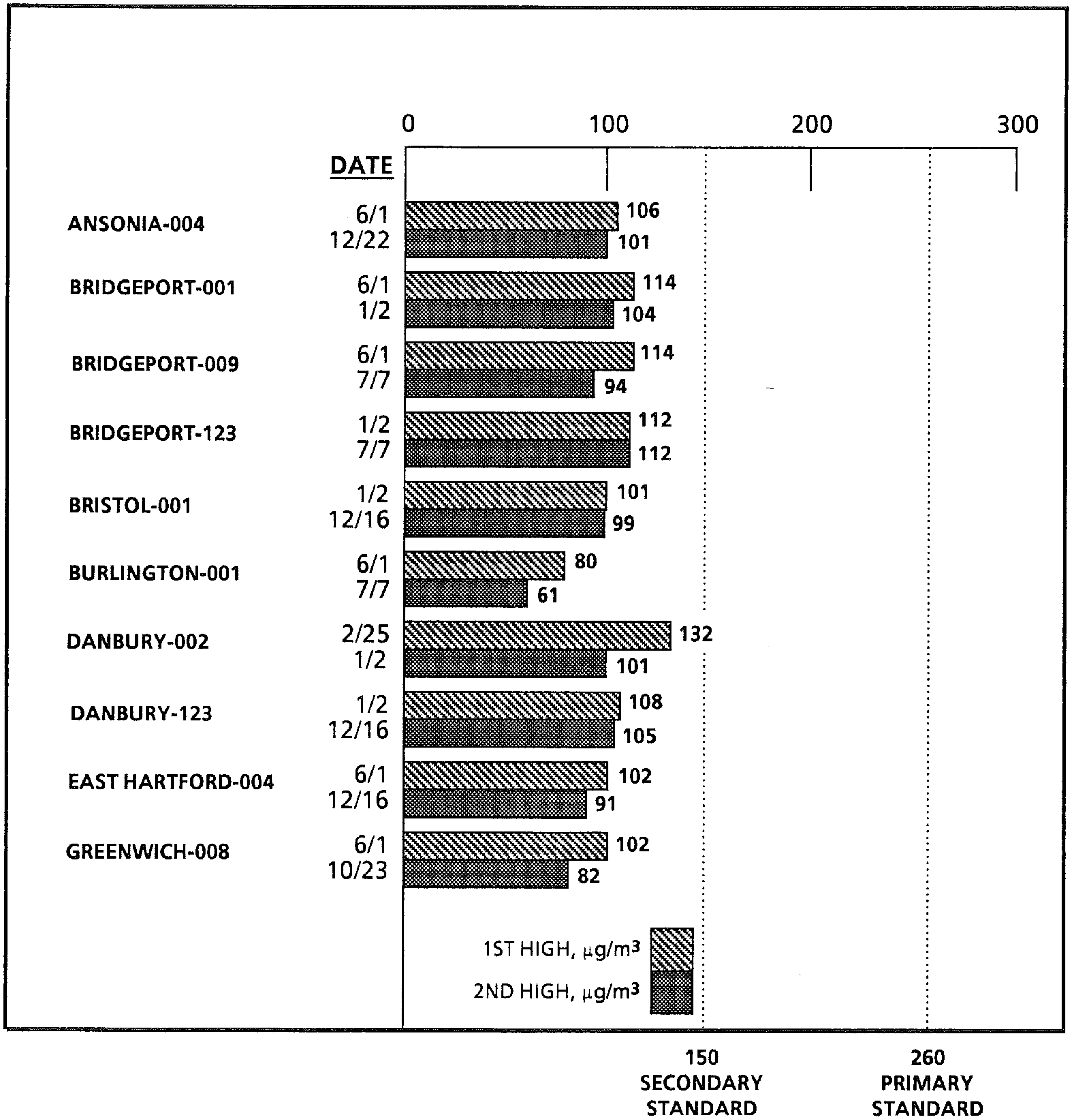
COMPLIANCE WITH ANNUAL TSP STANDARDS DURING 1986*

	NUMBER OF SITES		
	EXCEEDED	UNCERTAIN	ACHIEVED
PRIMARY STANDARD (75 $\mu g/m^3$)	0	0	40
SECONDARY STANDARD (60 $\mu g/m^3$)	0	0	40

* Using 95% confidence limits about the geometric mean concentration at each site.

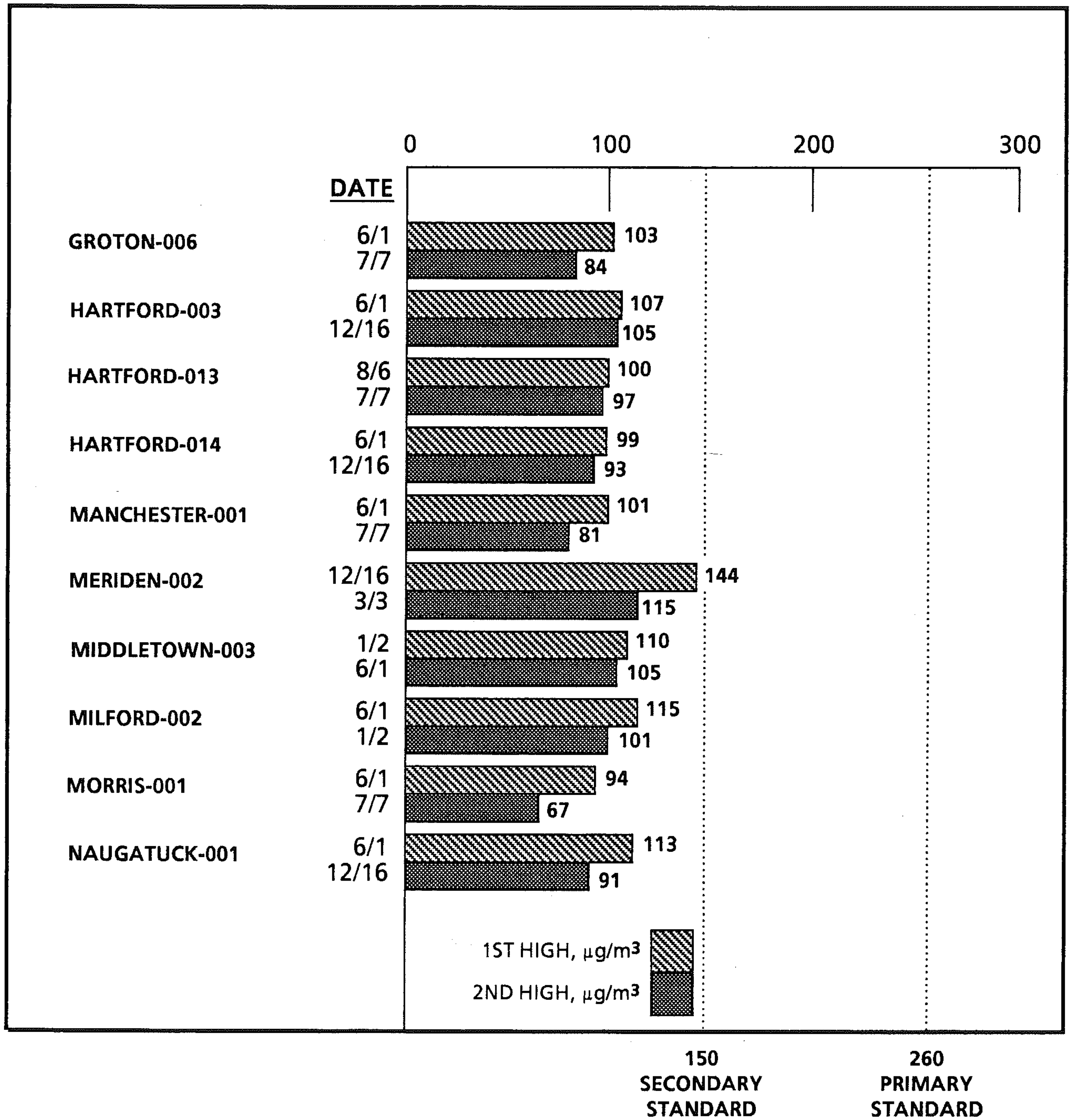
TABLE 7

1986 MAXIMUM 24-HOUR TSP CONCENTRATIONS



*	Database for the site is deficient in number or distribution of observations.
N.B.	When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

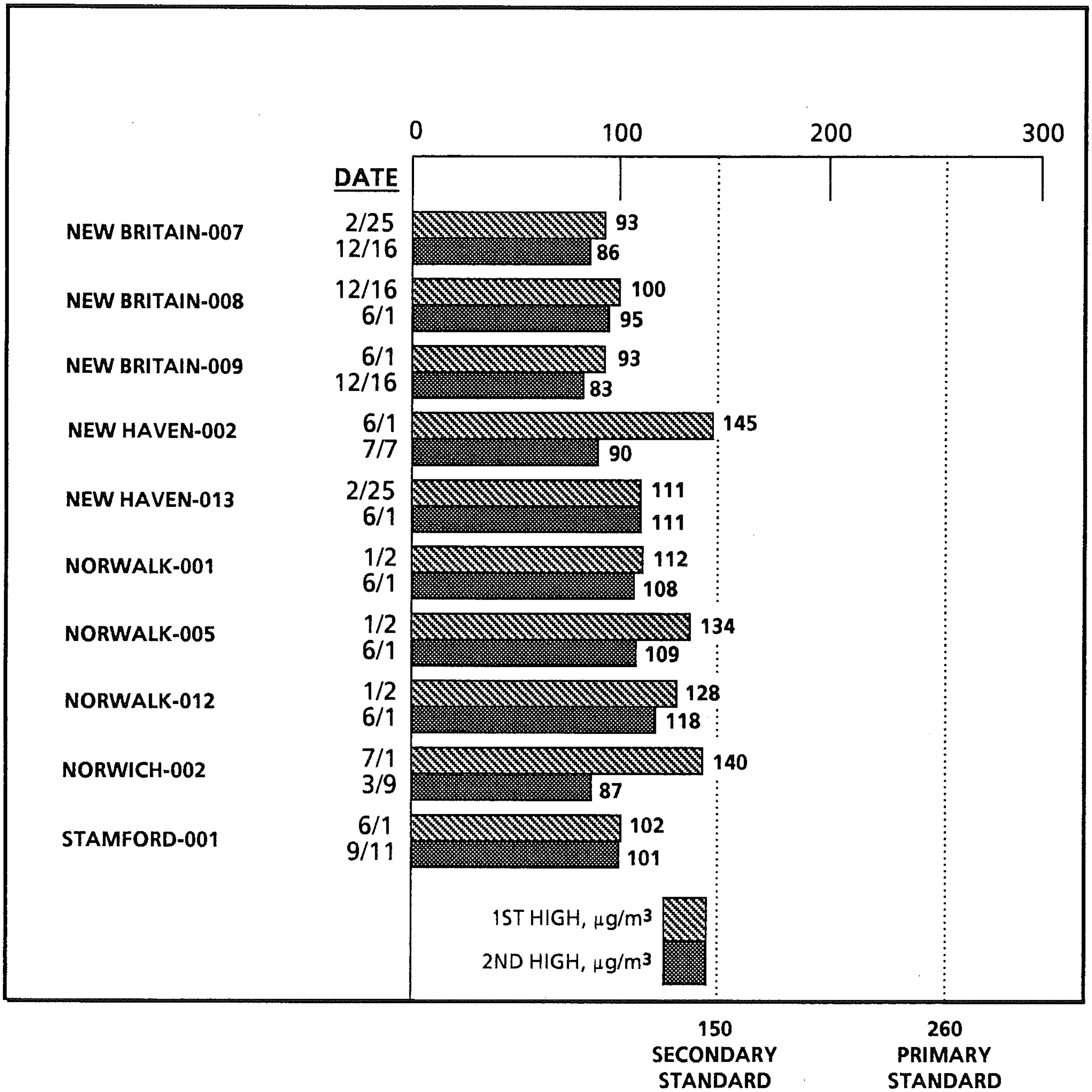
TABLE 7, CONTINUED



* Database for the site is deficient in number or distribution of observations.

N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

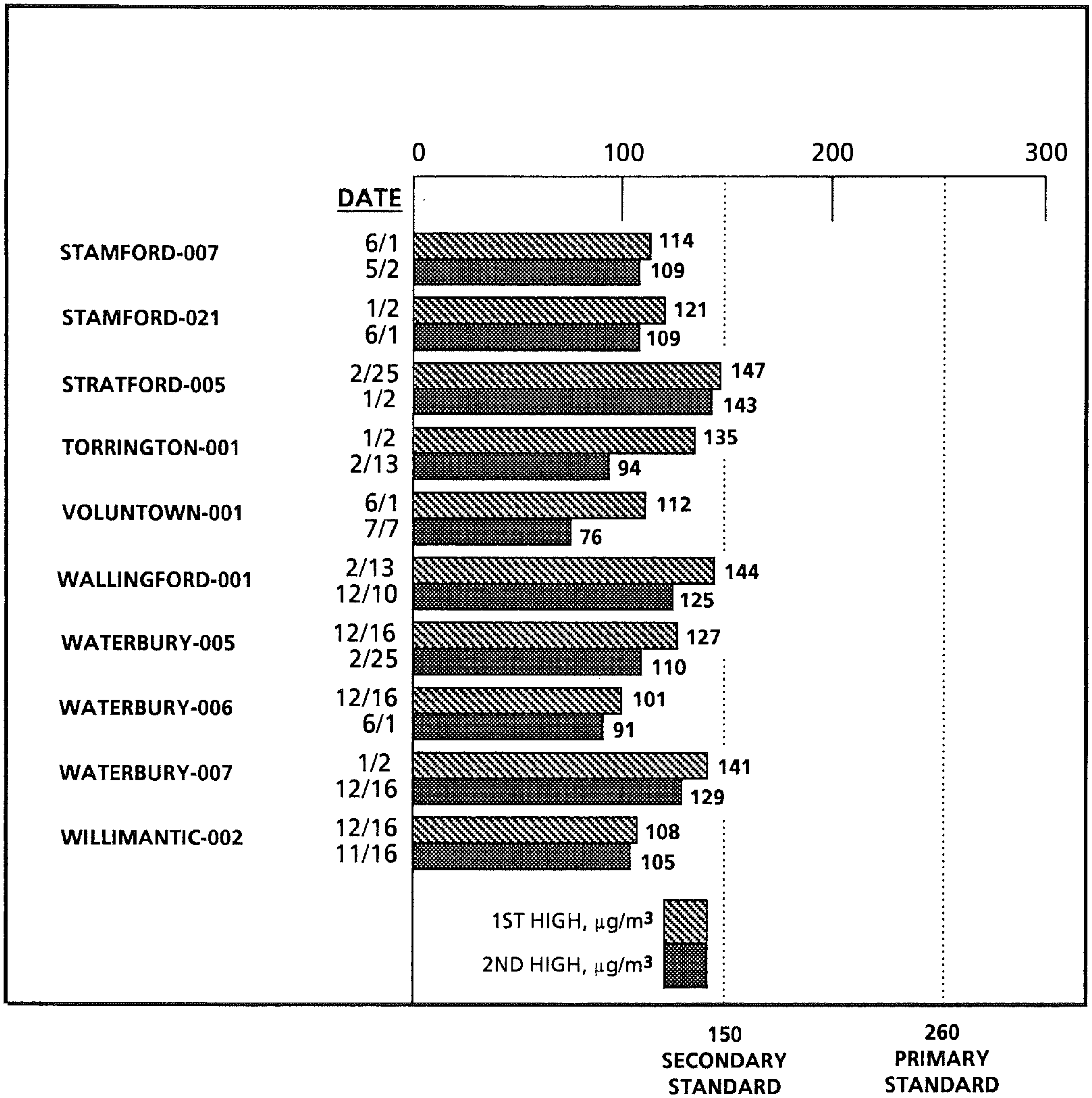
TABLE 7, CONTINUED



* Database for the site is deficient in number or distribution of observations.

N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

TABLE 7, CONTINUED



* Database for the site is deficient in number or distribution of observations.

N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

TABLE 8

SUMMARY OF THE STATISTICALLY PREDICTED NUMBER OF HI-VOL SITES EXCEEDING THE 24-HOUR TSP STANDARDS

		SITES WITH ≥ 2 DAYS EXCEEDING THE SECONDARY STANDARD (150 µg/m3)		SITES WITH ≥ 2 DAYS EXCEEDING THE PRIMARY STANDARD (260 µg/m3)	
YEAR	NO. OF SITES[1]	No. of Sites	Percentage of All Sites	No. of Sites	Percentage of All Sites
1972	46	43	93%	13	28%
1973	44	31	70%	11	25%
1974	62	49	79%	5	8%
1975	51	38	75%	2	4%
1976	38	33	87%	1	3%
1977	37	25	68%	0	0%
1978	34	20	59%	5	15%
1979	33	20	61%	2	6%
1980	33	14	42%	0	0%
1981	40	14	35%	0	0%
1982	39	11	28%	0	0%
1983	40	2	5%	0	0%
1984	40	4	10%	0	0%
1985	39	4	10%	0	0%
1986	40	13	33%	0	0%

[1] Only those sites are used which have sufficient data to permit the calculation of a valid annual average concentration.

TABLE 9

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
ANSONIA	~~0060~~ 0008	004

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.7	4.3	3.0	13.0	5.8
CHROMIUM	4	3	1	3	3
COPPER	50	60	50	110	70
IRON	640	510	670	690	630
LEAD	70	70	40	100	70
MANGANESE	12	13	8	12	11
NICKEL	12	10	8	18	12
VANADIUM	50	30	20	40	30
ZINC	310	180	60	190	180
WATER SOLUBLES (ng/m^3)					
NITRATE	2430	2990	3730	2000	2820
SULFATE	8270	8380	10410	9350	9150
AMMONIUM	150	200	110	250	180
TSP (µg/m^3)	43	44	39	42	42
SAMPLE COUNT	13	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
BRIDGEPORT	0060	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	1.4	1.3	1.4	1.3
CHROMIUM	4	5	8	2	5
COPPER	50	60	60	70	60
IRON	690	590	600	460	590
LEAD	120	100	70	80	90
MANGANESE	16	14	11	10	13
NICKEL	15	12	11	10	12
VANADIUM	40	20	10	20	20
ZINC	60	60	40	40	50
WATER SOLUBLES (ng/m³)					
NITRATE	2870	3740	3680	3140	3360
SULFATE	7920	9230	11590	9720	9650
AMMONIUM	120	250	60	240	170
TSP (µg/m³)	48	48	42	40	44
SAMPLE COUNT	15	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
BRIDGEPORT	0060	009

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.5	1.0	1.6	2.5	1.7
CHROMIUM	2	4	2	2	3
COPPER	90	60	30	70	60
IRON	510	550	760	410	560
LEAD	70	70	50	70	60
MANGANESE	19	13	12	10	13
NICKEL	15	11	18	12	14
VANADIUM	50	20	20	20	30
ZINC	60	50	40	50	50
WATER SOLUBLES (ng/m3)					
NITRATE	2890	3520	3730	3100	3330
SULFATE	7610	9170	11300	9650	9520
AMMONIUM	170	220	80	360	210
TSP (µg/m3)	41	45	43	38	42
SAMPLE COUNT	13	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
BRIDGEPORT	0060	123

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.1	1.3	2.0	1.7	1.5
CHROMIUM	6	12	10	3	8
COPPER	110	120	80	80	100
IRON	970	980	1190	770	980
LEAD	120	100	90	110	100
MANGANESE	30	24	16	19	22
NICKEL	19	19	17	19	18
VANADIUM	50	30	20	40	30
ZINC	140	60	60	90	90
WATER SOLUBLES (ng/m^3)					
NITRATE	3160	3510	3850	3510	3520
SULFATE	7940	7700	12480	10320	9720
AMMONIUM	310	100	100	490	250
TSP ($\mu g/m^3$)	56	50	55	50	53
SAMPLE COUNT	14	14	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
BRISTOL	0070	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	1.5	1.3	1.3	1.3
CHROMIUM	4	3	4	3	4
COPPER	40	40	60	70	50
IRON	740	440	410	670	560
LEAD	80	60	50	80	70
MANGANESE	16	12	8	16	13
NICKEL	13	6	7	14	10
VANADIUM	30	10	10	30	20
ZINC	40	50	40	40	40
WATER SOLUBLES (ng/m^3)					
NITRATE	2590	3330	3460	2520	2980
SULFATE	8790	9400	13380	10670	10680
AMMONIUM	250	110	110	330	200
TSP ($\mu g/m^3$)	52	43	40	43	44
SAMPLE COUNT	14	13	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
BURLINGTON	0085	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	0.8	1.4	0.6	0.8
CHROMIUM	1	1	5	1	2
COPPER	40	80	110	60	70
IRON	160	170	230	170	180
LEAD	20	20	30	20	20
MANGANESE	5	5	4	5	5
NICKEL	4	3	6	3	4
VANADIUM	10	<10	10	<10	10[a]
ZINC	10	20	20	10	20
WATER SOLUBLES (ng/m3)					
NITRATE	1860	2090	2340	1480	1960
SULFATE	6010	6540	8760	6670	7040
AMMONIUM	50	<10	<10	20	20[b]
TSP (µg/m3)	17	26	25	17	21
SAMPLE COUNT	15	14	16	13	

[a] The average was calculated using one quarter of the reportable limit in the 2nd and 4th quarters.
[b] The average was calculated using one quarter of the reportable limit in the 2nd and 3rd quarters.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
DANBURY	0175	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	1.0	1.5	1.1	1.1
CHROMIUM	2	2	5	3	3
COPPER	40	60	80	90	70
IRON	970	510	450	780	670
LEAD	70	50	60	70	60
MANGANESE	19	11	8	14	13
NICKEL	12	6	7	11	9
VANADIUM	30	10	10	20	20
ZINC	40	40	40	40	40
WATER SOLUBLES (ng/m^3)					
NITRATE	2490	3040	3520	2010	2830
SULFATE	7530	8200	11120	9500	9090
AMMONIUM	110	90	80	180	110
TSP ($\mu g/m^3$)	62	45	39	47	48
SAMPLE COUNT	15	15	16	11	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
DANBURY	0175	123

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	1.0	0.9	1.1	0.9
CHROMIUM	2	2	5	4	3
COPPER	60	90	80	60	70
IRON	830	590	620	920	740
LEAD	70	60	50	80	70
MANGANESE	17	13	9	19	15
NICKEL	12	6	8	9	9
VANADIUM	20	10	10	20	20
ZINC	30	40	80	40	50
WATER SOLUBLES (ng/m³)					
NITRATE	2150	2940	3200	2330	2660
SULFATE	6880	7760	11620	9030	8820
AMMONIUM	60	50	70	170	90
TSP (µg/m³)	49	46	44	54	48
SAMPLE COUNT	15	15	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
EAST HARTFORD	0220	004

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.9	1.2	2.1	2.0	1.6
CHROMIUM	14	3	4	4	6
COPPER	40	60	40	50	50
IRON	690	490	660	740	650
LEAD	70	70	80	100	80
MANGANESE	15	11	10	15	13
NICKEL	11	8	9	13	10
VANADIUM	20	10	20	20	20
ZINC	40	30	<10	50	30[a]
WATER SOLUBLES (ng/m3)					
NITRATE	2790	2810	3160	2720	2880
SULFATE	7910	9020	13080	10330	10150
AMMONIUM	160	170	200	310	210
TSP (µg/m3)	45	44	46	47	46
SAMPLE COUNT	15	14	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
GREENWICH	0330	008

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	1.0	1.1	0.9	1.0
CHROMIUM	2	2	3	3	3
COPPER	40	90	90	90	80
IRON	560	490	590	680	580
LEAD	50	50	50	90	60
MANGANESE	11	10	8	12	10
NICKEL	8	6	6	8	7
VANADIUM	10	<10	10	10	10[a]
ZINC	30	40	10	50	30
WATER SOLUBLES (ng/m^3)					
NITRATE	2490	3430	3200	2470	2920
SULFATE	6400	8780	10560	9020	8800
AMMONIUM	30	80	50	90	60
TSP ($\mu g/m^3$)	37	42	41	40	40
SAMPLE COUNT	13	15	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 2nd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
GROTON	0350	006

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.3	1.0	1.2	0.7	0.8
CHROMIUM	4	2	3	3	3
COPPER	40	60	40	40	40
IRON	410	330	430	380	390
LEAD	30	30	20	30	30
MANGANESE	10	9	6	9	8
NICKEL	14	13	10	34	18
VANADIUM	20	10	20	70	30
ZINC	20	70	<10	30	30[a]
WATER SOLUBLES (ng/m3)					
NITRATE	2790	3150	5160	2940	3540
SULFATE	6990	8570	9350	9990	8740
AMMONIUM	110	120	60	410	170
TSP (µg/m3)	35	39	31	37	35
SAMPLE COUNT	15	15	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
HARTFORD	0420	003

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.6	1.9	1.5	2.1	1.6
CHROMIUM	3	3	5	4	4
COPPER	80	100	90	60	80
IRON	950	760	1000	920	910
LEAD	80	70	70	80	70
MANGANESE	19	16	14	18	17
NICKEL	11	10	15	13	12
VANADIUM	30	10	30	30	20
ZINC	50	50	10	50	40
WATER SOLUBLES (ng/m³)					
NITRATE	2820	3520	6990	2820	4100
SULFATE	8210	9160	14190	10550	10650
AMMONIUM	210	230	360	360	290
TSP (µg/m³)	52	57	53	56	55
SAMPLE COUNT	12	15	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
HARTFORD	0420	013

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.2	2.0	1.4	2.2	1.7
CHROMIUM	4	3	6	5	5
COPPER	50	40	40	120	60
IRON	640	680	1020	1010	840
LEAD	100	70	80	100	90
MANGANESE	16	15	15	19	16
NICKEL	13	7	10	11	10
VANADIUM	30	10	10	20	20
ZINC	40	30	20	60	40
WATER SOLUBLES (ng/m3)					
NITRATE	2720	2960	6940	2580	3870
SULFATE	8200	9620	12590	10170	10220
AMMONIUM	220	100	140	330	200
TSP (μg/m3)	43	50	51	52	49
SAMPLE COUNT	14	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
HARTFORD	0420	014

	QUARTERLY AVG 1ST	2ND	3RD	4TH	ANNUAL AVG
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	1.0	1.4	0.9	1.0
CHROMIUM	3	2	5	2	3
COPPER	40	50	30	50	40
IRON	730	520	540	650	610
LEAD	90	70	50	80	70
MANGANESE	16	12	11	13	13
NICKEL	11	7	8	9	9
VANADIUM	30	10	10	20	20
ZINC	40	40	<10	40	30[a]
WATER SOLUBLES (ng/m^3)					
NITRATE	3090	3230	5810	2610	3720
SULFATE	7730	8900	12630	10770	10050
AMMONIUM	190	170	260	420	260
TSP ($\mu g/m^3$)	47	45	43	49	46
SAMPLE COUNT	15	15	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
MORRIS	0478	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	1.1	0.7	0.5	0.7
CHROMIUM	1	1	6	2	3
COPPER	40	40	40	50	40
IRON	280	240	320	210	260
LEAD	20	10	20	10	20
MANGANESE	7	7	5	6	6
NICKEL	3	4	7	3	4
VANADIUM	10	10	<10	<10	10[a]
ZINC	10	20	20	10	20
WATER SOLUBLES (ng/m³)					
NITRATE	1600	1550	4660	1230	2300
SULFATE	6050	6790	9510	6870	7340
AMMONIUM	50	<10	<10	20	20[b]
TSP (μg/m³)	22	33	30	20	26
SAMPLE COUNT	15	15	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd and 4th quarters.
[b] The average was calculated using one quarter of the reportable limit in the 2nd and 3rd quarters.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
MANCHESTER	0510	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	0.6	1.1	0.9	0.8
CHROMIUM	2	1	2	2	2
COPPER	40	60	90	60	60
IRON	550	380	560	400	470
LEAD	50	40	60	50	50
MANGANESE	14	10	9	12	11
NICKEL	7	5	7	9	7
VANADIUM	20	10	10	10	10
ZINC	30	30	40	30	30
WATER SOLUBLES (ng/m^3)					
NITRATE	2860	2880	5100	2730	3390
SULFATE	8050	8490	12840	10730	10030
AMMONIUM	130	140	210	240	180
TSP ($\mu g/m^3$)	40	40	38	38	39
SAMPLE COUNT	15	15	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
MERIDEN	0540	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	2.0	1.7	1.2	1.5
CHROMIUM	2	2	7	4	4
COPPER	140	120	60	70	100
IRON	870	570	640	940	760
LEAD	110	60	80	110	90
MANGANESE	17	14	10	17	14
NICKEL	13	7	10	15	11
VANADIUM	40	10	10	30	20
ZINC	90	120	70	100	90
WATER SOLUBLES (ng/m³)					
NITRATE	2760	3370	6250	2490	3770
SULFATE	7890	9240	11980	11230	10130
AMMONIUM	160	260	150	380	240
TSP (µg/m³)	56	49	43	56	51
SAMPLE COUNT	15	14	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
MIDDLETOWN	0570	003

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	1.5	1.3	1.5	1.3
CHROMIUM	8	2	5	5	5
COPPER	60	90	90	130	90
IRON	930	450	450	640	610
LEAD	80	110	50	80	80
MANGANESE	25	12	10	16	15
NICKEL	11	7	8	13	10
VANADIUM	20	10	10	10	10
ZINC	50	50	50	90	60
WATER SOLUBLES (ng/m³)					
NITRATE	3370	3480	6340	2450	3960
SULFATE	8700	9810	12910	11190	10730
AMMONIUM	120	180	110	160	140
TSP (µg/m³)	60	48	42	50	50
SAMPLE COUNT	13	14	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
MILFORD	0590	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	1.2	1.0	1.6	1.2
CHROMIUM	4	2	6	3	4
COPPER	40	50	230	170	120
IRON	820	410	480	530	560
LEAD	80	40	50	80	60
MANGANESE	17	9	7	11	11
NICKEL	59	13	10	20	26
VANADIUM	160	30	20	40	60
ZINC	70	40	70	60	60
WATER SOLUBLES (ng/m³)					
NITRATE	3260	3660	5790	2490	3730
SULFATE	9750	10010	9930	10150	9960
AMMONIUM	220	230	40	480	250
TSP (µg/m³)	55	45	36	43	45
SAMPLE COUNT	15	15	13	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NAUGATUCK	0660	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.9	2.4	20.0	18.1	11.3
CHROMIUM	4	3	9	4	5
COPPER	50	40	50	90	60
IRON	770	560	680	760	690
LEAD	90	70	90	140	100
MANGANESE	20	18	15	19	18
NICKEL	10	9	7	9	9
VANADIUM	20	10	10	20	10
ZINC	60	50	80	100	70
WATER SOLUBLES (ng/m^3)					
NITRATE	2480	3030	2890	2020	2610
SULFATE	8850	9740	13260	11120	10830
AMMONIUM	140	200	230	270	210
TSP (μg/m^3)	49	51	46	51	49
SAMPLE COUNT	14	14	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NEW BRITAIN	0680	007

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	0.6	0.7	1.5	0.9
CHROMIUM	2	2	2	3	2
COPPER	30	50	40	40	40
IRON	650	420	390	450	480
LEAD	60	60	50	80	60
MANGANESE	14	10	7	11	10
NICKEL	9	5	6	8	7
VANADIUM	20	10	10	20	10
ZINC	40	30	30	40	30
WATER SOLUBLES (ng/m^3)					
NITRATE	2600	2520	3130	2500	2700
SULFATE	7420	8230	11510	10130	9360
AMMONIUM	120	130	210	240	180
TSP ($\mu g/m^3$)	42	40	37	41	40
SAMPLE COUNT	15	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NEW BRITAIN	0680	008

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	0.7	0.8	1.0	1.0
CHROMIUM	2	1	<1	3	2[a]
COPPER	120	190	160	60	130
IRON	590	390	370	570	480
LEAD	80	50	60	80	70
MANGANESE	14	9	8	12	11
NICKEL	8	5	6	8	7
VANADIUM	20	10	10	10	10
ZINC	50	30	40	40	40
WATER SOLUBLES (ng/m3)					
NITRATE	2870	3010	3200	2220	2830
SULFATE	7570	8610	12040	9020	9310
AMMONIUM	110	140	360	260	220
TSP (µg/m3)	41	41	38	42	41
SAMPLE COUNT	15	15	15	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NEW BRITAIN	0680	009

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	0.8	0.8	1.0	0.9
CHROMIUM	2	2	2	5	3
COPPER	80	120	120	100	100
IRON	470	440	430	470	450
LEAD	60	40	50	80	60
MANGANESE	9	8	8	12	9
NICKEL	6	4	22	9	10
VANADIUM	10	10	10	20	10
ZINC	40	30	30	60	40
WATER SOLUBLES (ng/m³)					
NITRATE	2330	2750	2960	2050	2520
SULFATE	7240	8510	11500	9160	9110
AMMONIUM	140	270	290	350	260
TSP (µg/m³)	36	39	36	38	37
SAMPLE COUNT	15	14	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NEW HAVEN	0700	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.6	0.7	1.0	1.2	0.9
CHROMIUM	2	2	3	3	3
COPPER	90	90	80	90	90
IRON	960	620	440	710	680
LEAD	130	90	70	100	100
MANGANESE	16	13	8	13	13
NICKEL	10	9	5	17	11
VANADIUM	30	20	20	30	30
ZINC	60	30	50	60	50
WATER SOLUBLES (ng/m3)					
NITRATE	3000	4100	3390	2370	3170
SULFATE	8570	8750	11890	9970	9810
AMMONIUM	270	270	310	390	310
TSP (µg/m3)	50	55	41	48	48
SAMPLE COUNT	12	12	12	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NEW HAVEN	0700	013

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM		<.1	<.1	<.1	
CADMIUM		0.7	0.9	1.3	
CHROMIUM		2	3	2	
COPPER		130	110	190	
IRON		570	530	600	
LEAD		70	70	80	
MANGANESE		12	8	12	
NICKEL		10	11	23	
VANADIUM		20	30	60	
ZINC		40	40	50	
WATER SOLUBLES (ng/m3)					
NITRATE		3140	3390	2690	
SULFATE	8280	9570	11430	11090	10430
AMMONIUM		330	210	600	
TSP (µg/m3)	67	47	40	47	47
SAMPLE COUNT	6	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	0.9	0.6	1.0	0.8
CHROMIUM	3	2	3	2	3
COPPER	90	150	190	120	140
IRON	870	510	480	450	580
LEAD	80	50	40	60	60
MANGANESE	17	11	9	11	12
NICKEL	13	6	6	10	9
VANADIUM	30	20	10	20	20
ZINC	70	80	60	90	70
WATER SOLUBLES (ng/m^3)					
NITRATE	2370	3370	3380	2320	2880
SULFATE	8390	8480	10920	9800	9410
AMMONIUM	90	140	80	170	120
TSP ($\mu g/m^3$)	44	43	40	39	42
SAMPLE COUNT	15	15	16	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	005

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.9	0.5	0.7	1.5	0.9
CHROMIUM	3	1	5	4	3
COPPER	90	60	70	90	80
IRON	910	560	620	1530	910
LEAD	100	60	70	90	80
MANGANESE	18	11	9	32	18
NICKEL	16	5	8	12	10
VANADIUM	40	10	10	20	20
ZINC	70	50	50	90	70
WATER SOLUBLES (ng/m3)					
NITRATE	2490	3360	3270	2930	3020
SULFATE	8270	8640	12330	9280[a]	9800
AMMONIUM	110	240	170	230	190
TSP (µg/m3)	56	54	52	72[a]	59
SAMPLE COUNT	13	13	16	15[a]	

[a] The sample count for sulfate and TSP in the 4th quarter is 11.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	012

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.0	0.7	0.8	0.7	0.8
CHROMIUM	2	2	6	2	3
COPPER	30	230	160	80	130
IRON	810	710	560	450	640
LEAD	110	70	60	70	80
MANGANESE	16	13	9	9	12
NICKEL	11	7	7	8	8
VANADIUM	20	10	20	10	20
ZINC	100	50	50	50	60
WATER SOLUBLES (ng/m^3)					
NITRATE	3080	3690	3520	1700	3090
SULFATE	7620	8810	11850	9370	9470
AMMONIUM	110	190	320	150	200
TSP ($\mu g/m^3$)	47	47	42	41	44
SAMPLE COUNT	15	14	16	11	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
NORWICH	0840	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.3	0.5	0.7	1.3	0.7
CHROMIUM	2	2	5	2	3
COPPER	170	160	200	140	170
IRON	560	520	610	440	530
LEAD	60	80	170	80	100
MANGANESE	11	10	11	9	10
NICKEL	8	9	9	10	9
VANADIUM	20	20	30	20	20
ZINC	30	40	60	40	40
WATER SOLUBLES (ng/m3)					
NITRATE	2410	2350	3370	2420	2620
SULFATE	7670	8180	15860	9540	10170
AMMONIUM	160	100	90	190	140
TSP (μg/m3)	47	45	46[a]	44	46
SAMPLE COUNT	15	14	13[a]	14	

[a] The sample count for TSP in the 3rd quarter is 12.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
STAMFORD	1080	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	0.8	0.9	1.2	0.9
CHROMIUM	2	3	5	3	3
COPPER	40	40	20	40	30
IRON	740	880	780	640	760
LEAD	90	80	60	70	70
MANGANESE	14	18	14	13	15
NICKEL	12	7	7	13	10
VANADIUM	30	20	20	20	20
ZINC	70	60	60	60	60
WATER SOLUBLES (ng/m^3)					
NITRATE	3010	4290	4090	3140	3670
SULFATE	7540	8080	11870	9780	9410
AMMONIUM	90	260	130	270	190
TSP ($\mu g/m^3$)	47	58	56	52	54
SAMPLE COUNT	13	15	16	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
STAMFORD	1080	007

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.3	2.8	1.4	2.5	2.3
CHROMIUM	2	3	3	3	3
COPPER	40	60	40	40	50
IRON	470	610	480	730	580
LEAD	90	90	60	100	90
MANGANESE	14	16	9	17	14
NICKEL	12	8	7	13	10
VANADIUM	30	10	20	20	20
ZINC	140	40	100	130	100
WATER SOLUBLES (ng/m^3)					
NITRATE	2840	3610	3170	3310	3250
SULFATE	7780	9200	11120	10420	9670
AMMONIUM	90	170	130	340	190
TSP ($\mu g/m^3$)	43	55	44	58	50
SAMPLE COUNT	13	15	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
STAMFORD	1080	021

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.1	1.6	1.2	1.7	1.4
CHROMIUM	4	2	4	3	3
COPPER	190	180	180	70	160
IRON	620	690	540	640	620
LEAD	110	70	50	70	70
MANGANESE	13	14	9	13	12
NICKEL	15	7	7	14	11
VANADIUM	40	10	20	30	20
ZINC	60	60	70	70	60
WATER SOLUBLES (ng/m^3)					
NITRATE	3360	3790	4010	2900	3550
SULFATE	7920	8280	12120	9430	9460
AMMONIUM	150	190	130	390	210
TSP (µg/m^3)	46	51	48	45	48
SAMPLE COUNT	14	15	15	12	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
STRATFORD	1110	0005

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.5	1.2	1.8	1.7	1.6
CHROMIUM	5	3	4	4	4
COPPER	130	170	190	220	180
IRON	880	580	560	570	650
LEAD	160	90	70	140	120
MANGANESE	17	12	8	13	12
NICKEL	14	9	9	17	12
VANADIUM	40	20	20	40	30
ZINC	60	50	50	70	60
WATER SOLUBLES (ng/m3)					
NITRATE	2640	3210	3230	2930	3000
SULFATE	7770	9350	12380	10400	10040
AMMONIUM	190	290	160	370	250
TSP (µg/m3)	58	50	43	48	50
SAMPLE COUNT	15	13	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
TORRINGTON	1160	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	0.6	0.6	0.9	0.7
CHROMIUM	4	2	3	3	3
COPPER	40	50	70	60	60
IRON	840	410	450	630	580
LEAD	80	40	60	90	70
MANGANESE	16	11	10	15	13
NICKEL	10	3	6	6	6
VANADIUM	30	10	10	10	10
ZINC	50	30	50	40	40
WATER SOLUBLES (ng/m3)					
NITRATE	2080	2110	2760	1630	2160
SULFATE	8330	7740	11570	10390	9560
AMMONIUM	200	30	180	250	160
TSP (μg/m3)	54	37	37	44	43
SAMPLE COUNT	14	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
VOLUNTOWN	1205	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.4	0.4	0.4	0.9	0.5
CHROMIUM	2	1	1	1	1
COPPER	60	80	90	120	90
IRON	200	360	280	90	230
LEAD	10	10	10	20	10
MANGANESE	4	6	5	3	4
NICKEL	4	3	4	5	4
VANADIUM	10	10	10	10	10
ZINC	20	10	10	20	20
WATER SOLUBLES (ng/m^3)					
NITRATE	1480	1830	1710	1540	1640
SULFATE	5880	7400	8350	7480	7290
AMMONIUM	30	110	<10	40	40[a]
TSP (µg/m^3)	19	32	26	21	24
SAMPLE COUNT	15	14	16	15	

[a] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
WALLINGFORD	1210	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	0.6	1.0	0.9	0.8
CHROMIUM	3	2	3	4	3
COPPER	40	50	50	50	50
IRON	850	500	490	710	630
LEAD	60	50	50	70	60
MANGANESE	21	11	8	15	14
NICKEL	9	6	8	14	9
VANADIUM	30	10	20	20	20
ZINC	40	40	40	40	40
WATER SOLUBLES (ng/m³)					
NITRATE	2640	2840	2590	2290	2600
SULFATE	8000	9410	11950	11110	10130
AMMONIUM	220	220	100	310	210
TSP (µg/m³)	60	45	39	52	49
SAMPLE COUNT	15	15	16	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
WATERBURY	1240	005

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.0	1.4	3.9	3.2	2.6
CHROMIUM	8	12	7	18	11
COPPER	80	80	90	120	90
IRON	910	580	470	740	670
LEAD	100	70	70	120	90
MANGANESE	19	13	10	15	14
NICKEL	13	7	9	14	11
VANADIUM	40	20	10	30	20
ZINC	160	120	150	300	180
WATER SOLUBLES (ng/m3)					
NITRATE	2700	3600	2990	2440	2930
SULFATE	8300	8640	11920	11160	10040
AMMONIUM	390	180	330	650	390
TSP (µg/m3)	56	46	43	54	50
SAMPLE COUNT	15	15	16	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
WATERBURY	1240	006

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	3.2	0.8	2.0	3.2	2.2
CHROMIUM	7	4	5	7	6
COPPER	90	170	140	90	130
IRON	420	430	540	420	460
LEAD	60	30	60	60	50
MANGANESE	9	9	8	9	9
NICKEL	8	5	17	8	10
VANADIUM	10	10	10	10	10
ZINC	140	60	100	140	110
WATER SOLUBLES (ng/m^3)					
NITRATE	2950	3330	3000	2950	3060
SULFATE	7450	9260	11170	10380	9640
AMMONIUM	430	140	160	430	280
TSP ($\mu g/m^3$)	39	40	36	38	38
SAMPLE COUNT	13	15	16	13	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
WATERBURY	1240	007

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.5	1.2	4.1	3.8	2.7
CHROMIUM	7	9	9	20	11
COPPER	70	80	90	90	80
IRON	1000	580	610	950	780
LEAD	150	80	100	150	120
MANGANESE	22	13	11	19	16
NICKEL	15	7	10	18	12
VANADIUM	50	20	20	30	30
ZINC	170	70	90	200	130
WATER SOLUBLES (ng/m³)					
NITRATE	2680	3470	3400	2640	3060
SULFATE	8450	8500	13150	11370	10400
AMMONIUM	340	200	290	410	310
TSP (μg/m³)	66	55	49	62	58
SAMPLE COUNT	15	15	16	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1986 HI-VOL TSP

TOWN	AREA	SITE
WILLIMANTIC	1410	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.7	0.6	1.0	1.4	0.9
CHROMIUM	2	1	4	4	3
COPPER	40	50	80	80	60
IRON	640	300	410	640	500
LEAD	50	40	80	180	90
MANGANESE	11	7	7	13	10
NICKEL	6	24	10	26	17
VANADIUM	100	20	20	100	60
ZINC	30	30	60	200	80
WATER SOLUBLES (ng/m^3)					
NITRATE	2430	2780	2390	1820	2360
SULFATE	8060	8380	12650	11350	10000
AMMONIUM	200	130	130	260	180
TSP ($\mu g/m^3$)	50	39	39	54	46
SAMPLE COUNT	15	15	13	14	

TABLE 10

MONTHLY CHEMICAL CHARACTERIZATION OF 1986 LO-VOL TSP

TOWN	AREA	SITE
MANSFIELD	0520	001

	MONTHLY AVERAGE												ANNUAL AVG
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
METALS (ng/m³)													
BERYLLIUM	<.1	N/A	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	N/A	<.1
CADMIUM	0.3	N/A	0.6	0.5	0.5	0.3	0.4	0.5	0.5	0.4	0.4	N/A	0.4
CHROMIUM	1	N/A	1	1	1	1	4	2	4	2	2	N/A	2
COPPER	10	N/A	10	10	10	10	<10	<10	<10	10	10	N/A	10[a]
IRON	350	N/A	730	460	550	400	430	250	420	340	330	N/A	430
LEAD	30	N/A	30	20	10	20	30	30	40	20	20	N/A	30
MANGANESE	8	N/A	12	9	12	10	6	4	8	8	8	N/A	9
NICKEL	11	N/A	8	6	5	7	8	8	10	13	15	N/A	9
VANADIUM	30	N/A	30	10	10	10	20	20	20	30	30	N/A	20
ZINC	30	N/A	30	20	20	30	20	20	30	30	50	N/A	30
WATER SOLUBLES (ng/m³)													
NITRATE	1880	N/A	2730	2940	3960	3750	680	2270	3070	1100	1060	N/A	2340
SULFATE	4360	N/A	6650	6510	6860	6900	8210	8090	7450	6430	6470	N/A	6790
AMMONIUM	380	N/A	440	40	10	<10	180	30	80	40	30	N/A	120[b]
TSP (µg/m³)	30	N/A	47	34	52	53	31	26	31	27	26	N/A	36

[a] The average was calculated using one quarter of the reportable limit in July, August and September.
[b] The average was calculated using one quarter of the reportable limit in June.

TABLE 10, CONTINUED

MONTHLY CHEMICAL CHARACTERIZATION OF 1986 LO-VOL TSP

TOWN	AREA	SITE
PUTNAM	0900	002

	MONTHLY AVERAGE												ANNUAL AVG
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
METALS (ng/m³)													
BERYLLIUM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	N/A	<.1
CADMIUM	0.5	0.3	0.7	0.9	0.6	0.4	0.3	0.5	0.4	0.8	0.6	N/A	0.5
CHROMIUM	3	2	4	2	2	2	2	2	4	8	2	N/A	3
COPPER	10	10	10	10	10	<10	<10	<10	<10	10	20	N/A	10[a]
IRON	630	730	730	450	530	290	520	280	310	320	210	N/A	450
LEAD	60	50	40	40	30	30	30	40	50	20	10	N/A	40
MANGANESE	13	13	13	9	12	8	6	4	5	6	7	N/A	9
NICKEL	9	6	6	7	7	4	5	5	5	7	4	N/A	6
VANADIUM	30	20	20	10	10	10	10	10	10	10	10	N/A	10
ZINC	30	20	30	20	30	20	20	30	30	30	70	N/A	30
WATER SOLUBLES (ng/m³)													
NITRATE	2230	2410	2550	2810	2840	1380	1020	2410	2470	1120	980	N/A	2020
SULFATE	5670	7690	8140	5250	5530	5060	7640	7030	6410	6840	1950	N/A	6110
AMMONIUM	40	40	120	<10	<10	<10	40	<10	10	10	<10	N/A	20[b]
TSP (µg/m³)	48	55	52	37	49	43	26	25	25	25	21	N/A	37

[a] The average was calculated using one quarter of the reportable limit in June, July, August and September.
[b] The average was calculated using one quarter of the reportable limit in April, May, June, August and November.

TABLE 11

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
ANSONIA-004 (59)	TSP	106	101	93	86	83	82	74	71	71	68
	DATE	6/ 1/86	12/22/86	12/16/86	3/ 3/86	4/14/86	2/13/86	7/ 7/86	9/11/86	3/ 9/86	8/ 6/86
METEOROLOGICAL SITE	DIR (DEG)	230	270	210	210	150	290	300	210	200	200
NEWARK	VEL (MPH)	11.7	6.8	5.5	3.5	4.7	11.0	8.0	15.6	8.7	9.3
	SPD (MPH)	14.1	8.1	6.6	7.8	10.1	12.2	8.9	15.8	11.4	10.4
	RATIO	0.831	0.845	0.825	0.445	0.467	0.897	0.896	0.985	0.766	0.899
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	220	170	310	260	210	190	200
BRADLEY	VEL (MPH)	6.6	5.1	1.8	2.2	1.6	9.0	5.4	13.1	3.5	9.3
	SPD (MPH)	10.8	5.5	3.4	3.9	5.0	10.8	9.1	13.2	5.3	9.8
	RATIO	0.614	0.935	0.522	0.556	0.323	0.839	0.598	0.993	0.657	0.949
METEOROLOGICAL SITE	DIR (DEG)	200	250	260	220	150	280	240	220	230	230
BRIDGEPORT	VEL (MPH)	7.2	7.5	0.6	5.5	5.7	9.4	7.5	8.5	6.1	7.3
	SPD (MPH)	9.3	7.8	3.3	6.0	8.1	9.6	7.8	9.8	8.8	8.1
	RATIO	0.769	0.962	0.184	0.913	0.702	0.971	0.971	0.872	0.701	0.906
METEOROLOGICAL SITE	DIR (DEG)	240	270	160	260	300	280	280	240	230	240
WORCESTER	VEL (MPH)	8.2	8.7	1.2	3.7	3.1	14.5	9.9	15.8	6.3	9.9
	SPD (MPH)	10.1	9.1	3.4	5.3	5.0	14.8	11.5	15.8	7.9	10.4
	RATIO	0.814	0.963	0.346	0.691	0.617	0.976	0.862	0.997	0.803	0.956
BRIDGEPORT-001 (61)	TSP	114	104	85	81	72	72	69	69	61	61
	DATE	6/ 1/86	1/ 2/86	7/ 7/86	2/25/86	12/16/86	10/23/86	9/11/86	3/ 3/86	9/23/86	8/ 6/86
METEOROLOGICAL SITE	DIR (DEG)	230	220	300	340	210	240	210	210	220	200
NEWARK	VEL (MPH)	11.7	5.6	8.0	18.8	5.5	8.9	15.6	3.5	12.0	9.3
	SPD (MPH)	14.1	7.3	8.9	20.0	6.6	9.6	15.8	7.8	12.7	10.4
	RATIO	0.831	0.765	0.896	0.939	0.825	0.926	0.985	0.445	0.950	0.899
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	330	210	240	210	220	200	200
BRADLEY	VEL (MPH)	6.6	7.3	5.4	11.7	1.8	7.5	13.1	2.2	9.0	9.3
	SPD (MPH)	10.8	8.1	9.1	12.2	3.4	9.6	13.2	3.9	9.5	9.8
	RATIO	0.614	0.901	0.598	0.960	0.522	0.780	0.993	0.556	0.954	0.949
METEOROLOGICAL SITE	DIR (DEG)	200	250	240	330	260	260	220	220	240	230
BRIDGEPORT	VEL (MPH)	7.2	4.7	7.5	16.2	0.6	5.9	8.5	5.5	7.4	7.3
	SPD (MPH)	9.3	4.9	7.8	16.4	3.3	6.3	9.8	6.0	7.6	8.1
	RATIO	0.769	0.963	0.971	0.991	0.184	0.940	0.872	0.913	0.969	0.906
METEOROLOGICAL SITE	DIR (DEG)	240	230	280	320	160	270	240	260	240	240
WORCESTER	VEL (MPH)	8.2	9.4	9.9	11.2	1.2	10.4	15.8	3.7	8.3	9.9
	SPD (MPH)	10.1	9.6	11.5	11.6	3.4	11.4	15.8	5.3	9.1	10.4
	RATIO	0.814	0.978	0.862	0.962	0.346	0.920	0.997	0.691	0.912	0.956
BRIDGEPORT-009 (59)	TSP	114	94	87	76	71	62	60	58	58	57
	DATE	6/ 1/86	7/ 7/86	1/ 2/86	10/23/86	9/11/86	10/29/86	12/16/86	3/ 3/86	7/19/86	3/ 9/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	220	240	210	210	210	210	130	200
NEWARK	VEL (MPH)	11.7	8.0	5.6	8.9	15.6	9.1	5.5	3.5	5.7	8.7
	SPD (MPH)	14.1	8.9	7.3	9.6	15.8	9.5	6.6	7.8	6.5	11.4
	RATIO	0.831	0.896	0.765	0.926	0.985	0.957	0.825	0.445	0.887	0.766
METEOROLOGICAL SITE	DIR (DEG)	210	260	210	240	210	210	210	220	120	190
BRADLEY	VEL (MPH)	6.6	5.4	7.3	7.5	13.1	8.5	1.8	2.2	2.1	3.5
	SPD (MPH)	10.8	9.1	8.1	9.6	13.2	8.9	3.4	3.9	5.6	5.3
	RATIO	0.614	0.598	0.901	0.780	0.993	0.955	0.522	0.556	0.381	0.657

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	200	240	250	260	220	230	260	220	130	230
BRIDGEPORT	VEL (MPH)	7.2	7.5	4.7	5.9	8.5	7.6	0.6	5.5	4.8	6.1
	SPD (MPH)	9.3	7.8	4.9	6.3	9.8	7.9	3.3	6.0	6.2	8.8
	RATIO	0.769	0.971	0.963	0.940	0.872	0.956	0.184	0.913	0.770	0.701
METEOROLOGICAL SITE	DIR (DEG)	240	280	230	270	240	250	160	260	80	230
WORCESTER	VEL (MPH)	8.2	9.9	9.4	10.4	15.8	10.3	1.2	3.7	3.1	6.3
	SPD (MPH)	10.1	11.5	9.6	11.4	15.8	10.6	3.4	5.3	5.2	7.9
	RATIO	0.814	0.862	0.978	0.920	0.997	0.972	0.346	0.691	0.593	0.803
BRIDGEPORT-123 (59)	TSP	112	112	108	90	86	85	79	78	77	76
	DATE	1/ 2/86	7/ 7/86	9/11/86	10/23/86	2/25/86	12/16/86	3/ 3/86	10/29/86	8/ 6/86	9/29/86
METEOROLOGICAL SITE	DIR (DEG)	220	300	210	240	340	210	210	210	200	220
NEWARK	VEL (MPH)	5.6	8.0	15.6	8.9	18.8	5.5	3.5	9.1	9.3	9.9
	SPD (MPH)	7.3	8.9	15.8	9.6	20.0	6.6	7.8	9.5	10.4	10.4
	RATIO	0.765	0.896	0.985	0.926	0.939	0.825	0.445	0.957	0.899	0.958
METEOROLOGICAL SITE	DIR (DEG)	210	260	210	240	330	210	220	210	200	200
BRADLEY	VEL (MPH)	7.3	5.4	13.1	7.5	11.7	1.8	2.2	8.5	9.3	9.1
	SPD (MPH)	8.1	9.1	13.2	9.6	12.2	3.4	3.9	8.9	9.8	9.3
	RATIO	0.901	0.598	0.993	0.780	0.960	0.522	0.556	0.955	0.949	0.971
METEOROLOGICAL SITE	DIR (DEG)	250	240	220	260	330	260	220	230	230	250
BRIDGEPORT	VEL (MPH)	4.7	7.5	8.5	5.9	16.2	0.6	5.5	7.6	7.3	6.5
	SPD (MPH)	4.9	7.8	9.8	6.3	16.4	3.3	6.0	7.9	8.1	6.6
	RATIO	0.963	0.971	0.872	0.940	0.991	0.184	0.913	0.956	0.906	0.985
METEOROLOGICAL SITE	DIR (DEG)	230	280	240	270	320	160	260	250	240	260
WORCESTER	VEL (MPH)	9.4	9.9	15.8	10.4	11.2	1.2	3.7	10.3	9.9	12.5
	SPD (MPH)	9.6	11.5	15.8	11.4	11.6	3.4	5.3	10.6	10.4	12.7
	RATIO	0.978	0.862	0.997	0.920	0.962	0.346	0.691	0.972	0.956	0.991
BRISTOL-001 (58)	TSP	101	99	89	87	87	86	85	69	68	67
	DATE	1/ 2/86	12/16/86	6/ 1/86	3/ 3/86	2/25/86	2/ 1/86	7/ 7/86	2/13/86	12/22/86	9/11/86
METEOROLOGICAL SITE	DIR (DEG)	220	210	230	210	340	80	300	290	270	210
NEWARK	VEL (MPH)	5.6	5.5	11.7	3.5	18.8	3.6	8.0	11.0	6.8	15.6
	SPD (MPH)	7.3	6.6	14.1	7.8	20.0	9.3	8.9	12.2	8.1	15.8
	RATIO	0.765	0.825	0.831	0.445	0.939	0.385	0.896	0.897	0.845	0.985
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	220	330	230	260	310	210	210
BRADLEY	VEL (MPH)	7.3	1.8	6.6	2.2	11.7	1.7	5.4	9.0	5.1	13.1
	SPD (MPH)	8.1	3.4	10.8	3.9	12.2	5.9	9.1	10.8	5.5	13.2
	RATIO	0.901	0.522	0.614	0.556	0.960	0.283	0.598	0.839	0.935	0.993
METEOROLOGICAL SITE	DIR (DEG)	250	260	200	220	330	80	240	280	250	220
BRIDGEPORT	VEL (MPH)	4.7	0.6	7.2	5.5	16.2	4.8	7.5	9.4	7.5	8.5
	SPD (MPH)	4.9	3.3	9.3	6.0	16.4	6.6	7.8	9.6	7.8	9.8
	RATIO	0.963	0.184	0.769	0.913	0.991	0.725	0.971	0.971	0.962	0.872
METEOROLOGICAL SITE	DIR (DEG)	230	160	240	260	320	230	280	280	270	240
WORCESTER	VEL (MPH)	9.4	1.2	8.2	3.7	11.2	2.0	9.9	14.5	8.7	15.8
	SPD (MPH)	9.6	3.4	10.1	5.3	11.6	5.9	11.5	14.8	9.1	15.8
	RATIO	0.978	0.346	0.814	0.691	0.962	0.345	0.862	0.976	0.963	0.997

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BURLINGTON-001 (58)	TSP	80	61	52	39	36	35	35	34	34	34
	DATE	6/ 1/86	7/ 7/86	9/11/86	8/ 6/86	10/23/86	5/26/86	7/25/86	5/20/86	9/23/86	3/ 9/86
METEOROLOGICAL SITE NEWARK	DIR (DEG)	230	300	210	200	240	110	160	130	220	200
	VEL (MPH)	11.7	8.0	15.6	9.3	8.9	9.0	8.2	9.5	12.0	8.7
	SPD (MPH)	14.1	8.9	15.8	10.4	9.6	13.1	9.1	10.1	12.7	11.4
	RATIO	0.831	0.896	0.985	0.899	0.926	0.687	0.902	0.949	0.950	0.766
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	260	210	200	240	70	200	190	200	190
	VEL (MPH)	6.6	5.4	13.1	9.3	7.5	4.8	10.8	12.1	9.0	3.5
	SPD (MPH)	10.8	9.1	13.2	9.8	9.6	9.8	10.9	12.1	9.5	5.3
	RATIO	0.614	0.598	0.993	0.949	0.780	0.494	0.992	1.000	0.954	0.657
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	200	240	220	230	260	90	200	180	240	230
	VEL (MPH)	7.2	7.5	8.5	7.3	5.9	4.2	7.0	6.2	7.4	6.1
	SPD (MPH)	9.3	7.8	9.8	8.1	6.3	9.1	7.2	6.9	7.6	8.8
	RATIO	0.769	0.971	0.872	0.906	0.940	0.458	0.972	0.897	0.969	0.701
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	240	280	240	240	270	90	230	210	240	230
	VEL (MPH)	8.2	9.9	15.8	9.9	10.4	5.7	10.6	12.0	8.3	6.3
	SPD (MPH)	10.1	11.5	15.8	10.4	11.4	7.6	11.2	12.7	9.1	7.9
	RATIO	0.814	0.862	0.997	0.956	0.920	0.749	0.948	0.949	0.912	0.803
DANBURY-002 (57)	TSP	132	101	93	91	83	83	80	73	72	72
	DATE	2/25/86	1/ 2/86	3/ 3/86	3/ 9/86	2/13/86	12/22/86	6/ 1/86	7/ 7/86	4/ 2/86	9/11/86
METEOROLOGICAL SITE NEWARK	DIR (DEG)	340	220	210	200	290	270	230	300	340	210
	VEL (MPH)	18.8	5.6	3.5	8.7	11.0	6.8	11.7	8.0	9.2	15.6
	SPD (MPH)	20.0	7.3	7.8	11.4	12.2	8.1	14.1	8.9	13.9	15.8
	RATIO	0.939	0.765	0.445	0.766	0.897	0.845	0.831	0.896	0.657	0.985
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	330	210	220	190	310	210	210	260	330	210
	VEL (MPH)	11.7	7.3	2.2	3.5	9.0	5.1	6.6	5.4	4.7	13.1
	SPD (MPH)	12.2	8.1	3.9	5.3	10.8	5.5	10.8	9.1	8.6	13.2
	RATIO	0.960	0.901	0.556	0.657	0.839	0.935	0.614	0.598	0.544	0.993
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	330	250	220	230	280	250	200	240	340	220
	VEL (MPH)	16.2	4.7	5.5	6.1	9.4	7.5	7.2	7.5	9.4	8.5
	SPD (MPH)	16.4	4.9	6.0	8.8	9.6	7.8	9.3	7.8	10.4	9.8
	RATIO	0.991	0.963	0.913	0.701	0.971	0.962	0.769	0.971	0.911	0.872
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	320	230	260	230	280	270	240	280	310	240
	VEL (MPH)	11.2	9.4	3.7	6.3	14.5	8.7	8.2	9.9	8.2	15.8
	SPD (MPH)	11.6	9.6	5.3	7.9	14.8	9.1	10.1	11.5	12.5	15.8
	RATIO	0.962	0.978	0.691	0.803	0.976	0.963	0.814	0.862	0.659	0.997
DANBURY-123 (60)	TSP	108	105	98	88	87	84	82	78	75	74
	DATE	1/ 2/86	12/16/86	12/22/86	9/11/86	3/ 3/86	3/ 9/86	7/ 7/86	6/ 1/86	11/28/86	10/11/86
METEOROLOGICAL SITE NEWARK	DIR (DEG)	220	210	270	210	210	200	300	230	240	30
	VEL (MPH)	5.6	5.5	6.8	15.6	3.5	8.7	8.0	11.7	4.7	8.0
	SPD (MPH)	7.3	6.6	8.1	15.8	7.8	11.4	8.9	14.1	6.2	8.5
	RATIO	0.765	0.825	0.845	0.985	0.445	0.766	0.896	0.831	0.760	0.943
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	210	210	210	220	190	260	210	190	360
	VEL (MPH)	7.3	1.8	5.1	13.1	2.2	3.5	5.4	6.6	4.7	1.4
	SPD (MPH)	8.1	3.4	5.5	13.2	3.9	5.3	9.1	10.8	5.3	5.0
	RATIO	0.901	0.522	0.935	0.993	0.556	0.657	0.598	0.614	0.882	0.284

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	250	260	250	220	220	230	240	200	260	80
BRIDGEPORT	VEL (MPH)	4.7	0.6	7.5	8.5	5.5	6.1	7.5	7.2	3.8	7.2
	SPD (MPH)	4.9	3.3	7.8	9.8	6.0	8.8	7.8	9.3	4.6	7.6
	RATIO	0.963	0.184	0.962	0.872	0.913	0.701	0.971	0.769	0.833	0.942
METEOROLOGICAL SITE	DIR (DEG)	230	160	270	240	260	230	280	240	260	90
WORCESTER	VEL (MPH)	9.4	1.2	8.7	15.8	3.7	6.3	9.9	8.2	9.2	3.1
	SPD (MPH)	9.6	3.4	9.1	15.8	5.3	7.9	11.5	10.1	9.5	4.3
	RATIO	0.978	0.346	0.963	0.997	0.691	0.803	0.862	0.814	0.969	0.714
EAST HARTFORD-004 (60)	TSP	102	91	89	76	75	74	74	73	73	72
	DATE	6/ 1/86	12/16/86	7/ 7/86	9/11/86	2/13/86	1/ 2/86	3/ 3/86	12/10/86	12/22/86	2/25/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	300	210	290	220	210	270	270	340
NEWARK	VEL (MPH)	11.7	5.5	8.0	15.6	11.0	5.6	3.5	10.0	6.8	18.8
	SPD (MPH)	14.1	6.6	8.9	15.8	12.2	7.3	7.8	10.8	8.1	20.0
	RATIO	0.831	0.825	0.896	0.985	0.897	0.765	0.445	0.930	0.845	0.939
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	210	310	210	220	310	210	330
BRADLEY	VEL (MPH)	6.6	1.8	5.4	13.1	9.0	7.3	2.2	3.2	5.1	11.7
	SPD (MPH)	10.8	3.4	9.1	13.2	10.8	8.1	3.9	5.5	5.5	12.2
	RATIO	0.614	0.522	0.598	0.993	0.839	0.901	0.556	0.581	0.935	0.960
METEOROLOGICAL SITE	DIR (DEG)	200	260	240	220	280	250	220	280	250	330
BRIDGEPORT	VEL (MPH)	7.2	0.6	7.5	8.5	9.4	4.7	5.5	8.8	7.5	16.2
	SPD (MPH)	9.3	3.3	7.8	9.8	9.6	4.9	6.0	9.6	7.8	16.4
	RATIO	0.769	0.184	0.971	0.872	0.971	0.963	0.913	0.918	0.962	0.991
METEOROLOGICAL SITE	DIR (DEG)	240	160	280	240	280	230	260	290	270	320
WORCESTER	VEL (MPH)	8.2	1.2	9.9	15.8	14.5	9.4	3.7	12.1	8.7	11.2
	SPD (MPH)	10.1	3.4	11.5	15.8	14.8	9.6	5.3	12.8	9.1	11.6
	RATIO	0.814	0.346	0.862	0.997	0.976	0.978	0.691	0.947	0.963	0.962
GREENWICH-008 (59)	TSP	102	82	80	70	62	61	59	58	57	57
	DATE	6/ 1/86	10/23/86	7/ 7/86	9/11/86	3/ 3/86	12/16/86	12/22/86	3/ 9/86	5/ 2/86	2/25/86
METEOROLOGICAL SITE	DIR (DEG)	230	240	300	210	210	210	270	200	310	340
NEWARK	VEL (MPH)	11.7	8.9	8.0	15.6	3.5	5.5	6.8	8.7	16.5	18.8
	SPD (MPH)	14.1	9.6	8.9	15.8	7.8	6.6	8.1	11.4	18.8	20.0
	RATIO	0.831	0.926	0.896	0.985	0.445	0.825	0.845	0.766	0.878	0.939
METEOROLOGICAL SITE	DIR (DEG)	210	240	260	210	220	210	210	190	300	330
BRADLEY	VEL (MPH)	6.6	7.5	5.4	13.1	2.2	1.8	5.1	3.5	11.8	11.7
	SPD (MPH)	10.8	9.6	9.1	13.2	3.9	3.4	5.5	5.3	13.5	12.2
	RATIO	0.614	0.780	0.598	0.993	0.556	0.522	0.935	0.657	0.877	0.960
METEOROLOGICAL SITE	DIR (DEG)	200	260	240	220	220	260	250	230	300	330
BRIDGEPORT	VEL (MPH)	7.2	5.9	7.5	8.5	5.5	0.6	7.5	6.1	11.6	16.2
	SPD (MPH)	9.3	6.3	7.8	9.8	6.0	3.3	7.8	8.8	11.8	16.4
	RATIO	0.769	0.940	0.971	0.872	0.913	0.184	0.962	0.701	0.982	0.991
METEOROLOGICAL SITE	DIR (DEG)	240	270	280	240	260	160	270	230	290	320
WORCESTER	VEL (MPH)	8.2	10.4	9.9	15.8	3.7	1.2	8.7	6.3	13.9	11.2
	SPD (MPH)	10.1	11.4	11.5	15.8	5.3	3.4	9.1	7.9	14.4	11.6
	RATIO	0.814	0.920	0.862	0.997	0.691	0.346	0.963	0.803	0.966	0.962

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
GROTON-006 (61)	TSP	103	84	77	77	57	54	51	51	50	49
	DATE	6/ 1/86	7/ 7/86	2/25/86	10/23/86	2/13/86	5/ 2/86	12/16/86	3/ 3/86	3/ 9/86	9/23/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	340	240	290	310	210	210	200	220
NEWARK	VEL (MPH)	11.7	8.0	18.8	8.9	11.0	16.5	5.5	3.5	8.7	12.0
	SPD (MPH)	14.1	8.9	20.0	9.6	12.2	18.8	6.6	7.8	11.4	12.7
	RATIO	0.831	0.896	0.939	0.926	0.897	0.878	0.825	0.445	0.766	0.950
METEOROLOGICAL SITE	DIR (DEG)	210	260	330	240	310	300	210	220	190	200
BRADLEY	VEL (MPH)	6.6	5.4	11.7	7.5	9.0	11.8	1.8	2.2	3.5	9.0
	SPD (MPH)	10.8	9.1	12.2	9.6	10.8	13.5	3.4	3.9	5.3	9.5
	RATIO	0.614	0.598	0.960	0.780	0.839	0.877	0.522	0.556	0.657	0.954
METEOROLOGICAL SITE	DIR (DEG)	200	240	330	260	280	300	260	220	230	240
BRIDGEPORT	VEL (MPH)	7.2	7.5	16.2	5.9	9.4	11.6	0.6	5.5	6.1	7.4
	SPD (MPH)	9.3	7.8	16.4	6.3	9.6	11.8	3.3	6.0	8.8	7.6
	RATIO	0.769	0.971	0.991	0.940	0.971	0.982	0.184	0.913	0.701	0.969
METEOROLOGICAL SITE	DIR (DEG)	240	280	320	270	280	290	160	260	230	240
WORCESTER	VEL (MPH)	8.2	9.9	11.2	10.4	14.5	13.9	1.2	3.7	6.3	8.3
	SPD (MPH)	10.1	11.5	11.6	11.4	14.8	14.4	3.4	5.3	7.9	9.1
	RATIO	0.814	0.862	0.962	0.920	0.976	0.966	0.346	0.691	0.803	0.912
HARTFORD-003 (57)	TSP	107	105	102	101	89	88	86	83	79	79
	DATE	6/ 1/86	12/16/86	2/25/86	7/ 7/86	12/10/86	9/11/86	2/13/86	5/14/86	10/29/86	10/23/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	340	300	270	210	290	140	210	240
NEWARK	VEL (MPH)	11.7	5.5	18.8	8.0	10.0	15.6	11.0	6.9	9.1	8.9
	SPD (MPH)	14.1	6.6	20.0	8.9	10.8	15.8	12.2	10.4	9.5	9.6
	RATIO	0.831	0.825	0.939	0.896	0.930	0.985	0.897	0.663	0.957	0.926
METEOROLOGICAL SITE	DIR (DEG)	210	210	330	260	310	210	310	170	210	240
BRADLEY	VEL (MPH)	6.6	1.8	11.7	5.4	3.2	13.1	9.0	6.5	8.5	7.5
	SPD (MPH)	10.8	3.4	12.2	9.1	5.5	13.2	10.8	7.5	8.9	9.6
	RATIO	0.614	0.522	0.960	0.598	0.581	0.993	0.839	0.869	0.955	0.780
METEOROLOGICAL SITE	DIR (DEG)	200	260	330	240	280	220	280	90	230	260
BRIDGEPORT	VEL (MPH)	7.2	0.6	16.2	7.5	8.8	8.5	9.4	7.5	7.6	5.9
	SPD (MPH)	9.3	3.3	16.4	7.8	9.6	9.8	9.6	8.3	7.9	6.3
	RATIO	0.769	0.184	0.991	0.971	0.918	0.872	0.971	0.902	0.956	0.940
METEOROLOGICAL SITE	DIR (DEG)	240	160	320	280	290	240	280	240	250	270
WORCESTER	VEL (MPH)	8.2	1.2	11.2	9.9	12.1	15.8	14.5	0.3	10.3	10.4
	SPD (MPH)	10.1	3.4	11.6	11.5	12.8	15.8	14.8	6.8	10.6	11.4
	RATIO	0.814	0.346	0.962	0.862	0.947	0.997	0.976	0.040	0.972	0.920
HARTFORD-013 (60)	TSP	100	97	95	87	86	84	77	75	72	71
	DATE	8/ 6/86	7/ 7/86	6/ 1/86	10/29/86	12/16/86	9/11/86	10/23/86	2/25/86	11/28/86	9/23/86
METEOROLOGICAL SITE	DIR (DEG)	200	300	230	210	210	210	240	340	240	220
NEWARK	VEL (MPH)	9.3	8.0	11.7	9.1	5.5	15.6	8.9	18.8	4.7	12.0
	SPD (MPH)	10.4	8.9	14.1	9.5	6.6	15.8	9.6	20.0	6.2	12.7
	RATIO	0.899	0.896	0.831	0.957	0.825	0.985	0.926	0.939	0.760	0.950
METEOROLOGICAL SITE	DIR (DEG)	200	260	210	210	210	210	240	330	190	200
BRADLEY	VEL (MPH)	9.3	5.4	6.6	8.5	1.8	13.1	7.5	11.7	4.7	9.0
	SPD (MPH)	9.8	9.1	10.8	8.9	3.4	13.2	9.6	12.2	5.3	9.5
	RATIO	0.949	0.598	0.614	0.955	0.522	0.993	0.780	0.960	0.882	0.954

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	230	240	200	230	260	220	260	330	260	240
BRIDGEPORT	VEL (MPH)	7.3	7.5	7.2	7.6	0.6	8.5	5.9	16.2	3.8	7.4
	SPD (MPH)	8.1	7.8	9.3	7.9	3.3	9.8	6.3	16.4	4.6	7.6
	RATIO	0.906	0.971	0.769	0.956	0.184	0.872	0.940	0.991	0.833	0.969
METEOROLOGICAL SITE	DIR (DEG)	240	280	240	250	160	240	270	320	260	240
WORCESTER	VEL (MPH)	9.9	9.9	8.2	10.3	1.2	15.8	10.4	11.2	9.2	8.3
	SPD (MPH)	10.4	11.5	10.1	10.6	3.4	15.8	11.4	11.6	9.5	9.1
	RATIO	0.956	0.862	0.814	0.972	0.346	0.997	0.920	0.962	0.969	0.912
HARTFORD-014 (61)	TSP	99	93	90	85	77	74	69	68	67	65
	DATE	6/ 1/86	12/16/86	7/ 7/86	3/ 3/86	2/25/86	1/ 2/86	12/22/86	9/11/86	10/23/86	11/28/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	300	210	340	220	270	210	240	240
NEWARK	VEL (MPH)	11.7	5.5	8.0	3.5	18.8	5.6	6.8	15.6	8.9	4.7
	SPD (MPH)	14.1	6.6	8.9	7.8	20.0	7.3	8.1	15.8	9.6	6.2
	RATIO	0.831	0.825	0.896	0.445	0.939	0.765	0.845	0.985	0.926	0.760
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	220	330	210	210	210	240	190
BRADLEY	VEL (MPH)	6.6	1.8	5.4	2.2	11.7	7.3	5.1	13.1	7.5	4.7
	SPD (MPH)	10.8	3.4	9.1	3.9	12.2	8.1	5.5	13.2	9.6	5.3
	RATIO	0.614	0.522	0.598	0.556	0.960	0.901	0.935	0.993	0.780	0.882
METEOROLOGICAL SITE	DIR (DEG)	200	260	240	220	330	250	250	220	260	260
BRIDGEPORT	VEL (MPH)	7.2	0.6	7.5	5.5	16.2	4.7	7.5	8.5	5.9	3.8
	SPD (MPH)	9.3	3.3	7.8	6.0	16.4	4.9	7.8	9.8	6.3	4.6
	RATIO	0.769	0.184	0.971	0.913	0.991	0.963	0.962	0.872	0.940	0.833
METEOROLOGICAL SITE	DIR (DEG)	240	160	280	260	320	230	270	240	270	260
WORCESTER	VEL (MPH)	8.2	1.2	9.9	3.7	11.2	9.4	8.7	15.8	10.4	9.2
	SPD (MPH)	10.1	3.4	11.5	5.3	11.6	9.6	9.1	15.8	11.4	9.5
	RATIO	0.814	0.346	0.862	0.691	0.962	0.978	0.963	0.997	0.920	0.969
MANCHESTER-001 (60)	TSP	101	81	77	71	67	66	63	62	60	56
	DATE	6/ 1/86	7/ 7/86	3/ 3/86	2/25/86	7/19/86	3/ 9/86	12/16/86	10/23/86	9/11/86	11/22/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	210	340	130	200	210	240	210	310
NEWARK	VEL (MPH)	11.7	8.0	3.5	18.8	5.7	8.7	5.5	8.9	15.6	8.1
	SPD (MPH)	14.1	8.9	7.8	20.0	6.5	11.4	6.6	9.6	15.8	9.8
	RATIO	0.831	0.896	0.445	0.939	0.887	0.766	0.825	0.926	0.985	0.825
METEOROLOGICAL SITE	DIR (DEG)	210	260	220	330	120	190	210	240	210	330
BRADLEY	VEL (MPH)	6.6	5.4	2.2	11.7	2.1	3.5	1.8	7.5	13.1	9.1
	SPD (MPH)	10.8	9.1	3.9	12.2	5.6	5.3	3.4	9.6	13.2	9.9
	RATIO	0.614	0.598	0.556	0.960	0.381	0.657	0.522	0.780	0.993	0.922
METEOROLOGICAL SITE	DIR (DEG)	200	240	220	330	130	230	260	260	220	350
BRIDGEPORT	VEL (MPH)	7.2	7.5	5.5	16.2	4.8	6.1	0.6	5.9	8.5	6.7
	SPD (MPH)	9.3	7.8	6.0	16.4	6.2	8.8	3.3	6.3	9.8	6.8
	RATIO	0.769	0.971	0.913	0.991	0.770	0.701	0.184	0.940	0.872	0.986
METEOROLOGICAL SITE	DIR (DEG)	240	280	260	320	80	230	160	270	240	320
WORCESTER	VEL (MPH)	8.2	9.9	3.7	11.2	3.1	6.3	1.2	10.4	15.8	15.7
	SPD (MPH)	10.1	11.5	5.3	11.6	5.2	7.9	3.4	11.4	15.8	15.8
	RATIO	0.814	0.862	0.691	0.962	0.593	0.803	0.346	0.920	0.997	0.991

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)		RANK	1	2	3	4	5	6	7	8	9	10
MERIDEN-002 (60)		TSP	144	115	114	99	98	91	87	83	77	74
		DATE	12/16/86	3/ 3/86	6/ 1/86	1/ 2/86	7/ 7/86	12/22/86	2/13/86	11/28/86	4/ 2/86	12/10/86
	METEOROLOGICAL SITE	DIR (DEG)	210	210	230	220	300	270	290	240	340	270
	NEWARK	VEL (MPH)	5.5	3.5	11.7	5.6	8.0	6.8	11.0	4.7	9.2	10.0
		SPD (MPH)	6.6	7.8	14.1	7.3	8.9	8.1	12.2	6.2	13.9	10.8
		RATIO	0.825	0.445	0.831	0.765	0.896	0.845	0.897	0.760	0.657	0.930
	METEOROLOGICAL SITE	DIR (DEG)	210	220	210	210	260	210	310	190	330	310
	BRADLEY	VEL (MPH)	1.8	2.2	6.6	7.3	5.4	5.1	9.0	4.7	4.7	3.2
		SPD (MPH)	3.4	3.9	10.8	8.1	9.1	5.5	10.8	5.3	8.6	5.5
		RATIO	0.522	0.556	0.614	0.901	0.598	0.935	0.839	0.882	0.544	0.581
	METEOROLOGICAL SITE	DIR (DEG)	260	220	200	250	240	250	280	260	340	280
	BRIDGEPORT	VEL (MPH)	0.6	5.5	7.2	4.7	7.5	7.5	9.4	3.8	9.4	8.8
		SPD (MPH)	3.3	6.0	9.3	4.9	7.8	7.8	9.6	4.6	10.4	9.6
		RATIO	0.184	0.913	0.769	0.963	0.971	0.962	0.971	0.833	0.911	0.918
	METEOROLOGICAL SITE	DIR (DEG)	160	260	240	230	280	270	280	260	310	290
	WORCESTER	VEL (MPH)	1.2	3.7	8.2	9.4	9.9	8.7	14.5	9.2	8.2	12.1
		SPD (MPH)	3.4	5.3	10.1	9.6	11.5	9.1	14.8	9.5	12.5	12.8
		RATIO	0.346	0.691	0.814	0.978	0.862	0.963	0.976	0.969	0.659	0.947
MIDDLETOWN-003 (56)		TSP	110	105	96	90	87	86	82	79	76	74
		DATE	1/ 2/86	6/ 1/86	2/25/86	3/ 3/86	2/13/86	7/ 7/86	10/23/86	2/19/86	12/16/86	12/10/86
	METEOROLOGICAL SITE	DIR (DEG)	220	230	340	210	290	300	240	80	210	270
	NEWARK	VEL (MPH)	5.6	11.7	18.8	3.5	11.0	8.0	8.9	5.8	5.5	10.0
		SPD (MPH)	7.3	14.1	20.0	7.8	12.2	8.9	9.6	8.9	6.6	10.8
		RATIO	0.765	0.831	0.939	0.445	0.897	0.896	0.926	0.646	0.825	0.930
	METEOROLOGICAL SITE	DIR (DEG)	210	210	330	220	310	260	240	30	210	310
	BRADLEY	VEL (MPH)	7.3	6.6	11.7	2.2	9.0	5.4	7.5	6.9	1.8	3.2
		SPD (MPH)	8.1	10.8	12.2	3.9	10.8	9.1	9.6	7.5	3.4	5.5
		RATIO	0.901	0.614	0.960	0.556	0.839	0.598	0.780	0.930	0.522	0.581
	METEOROLOGICAL SITE	DIR (DEG)	250	200	330	220	280	240	260	70	260	280
	BRIDGEPORT	VEL (MPH)	4.7	7.2	16.2	5.5	9.4	7.5	5.9	7.1	0.6	8.8
		SPD (MPH)	4.9	9.3	16.4	6.0	9.6	7.8	6.3	8.1	3.3	9.6
		RATIO	0.963	0.769	0.991	0.913	0.971	0.971	0.940	0.876	0.184	0.918
	METEOROLOGICAL SITE	DIR (DEG)	230	240	320	260	280	280	270	70	160	290
	WORCESTER	VEL (MPH)	9.4	8.2	11.2	3.7	14.5	9.9	10.4	4.5	1.2	12.1
		SPD (MPH)	9.6	10.1	11.6	5.3	14.8	11.5	11.4	4.7	3.4	12.8
		RATIO	0.978	0.814	0.962	0.691	0.976	0.862	0.920	0.957	0.346	0.947
MILFORD-002 (58)		TSP	115	101	87	85	84	80	80	71	59	59
		DATE	6/ 1/86	1/ 2/86	3/ 3/86	12/16/86	2/25/86	10/23/86	2/13/86	3/ 9/86	1/ 8/86	2/ 1/86
	METEOROLOGICAL SITE	DIR (DEG)	230	220	210	210	340	240	290	200	310	80
	NEWARK	VEL (MPH)	11.7	5.6	3.5	5.5	18.8	8.9	11.0	8.7	14.5	3.6
		SPD (MPH)	14.1	7.3	7.8	6.6	20.0	9.6	12.2	11.4	14.8	9.3
		RATIO	0.831	0.765	0.445	0.825	0.939	0.926	0.897	0.766	0.979	0.385
	METEOROLOGICAL SITE	DIR (DEG)	210	210	220	210	330	240	310	190	320	230
	BRADLEY	VEL (MPH)	6.6	7.3	2.2	1.8	11.7	7.5	9.0	3.5	6.3	1.7
		SPD (MPH)	10.8	8.1	3.9	3.4	12.2	9.6	10.8	5.3	8.1	5.9
		RATIO	0.614	0.901	0.556	0.522	0.960	0.780	0.839	0.657	0.788	0.283

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	200	250	220	260	330	260	280	230	320	80
BRIDGEPORT	VEL (MPH)	7.2	4.7	5.5	0.6	16.2	5.9	9.4	6.1	11.4	4.8
	SPD (MPH)	9.3	4.9	6.0	3.3	16.4	6.3	9.6	8.8	11.8	6.6
	RATIO	0.769	0.963	0.913	0.184	0.991	0.940	0.971	0.701	0.968	0.725
METEOROLOGICAL SITE	DIR (DEG)	240	230	260	160	320	270	280	230	310	230
WORCESTER	VEL (MPH)	8.2	9.4	3.7	1.2	11.2	10.4	14.5	6.3	14.8	2.0
	SPD (MPH)	10.1	9.6	5.3	3.4	11.6	11.4	14.8	7.9	16.1	5.9
	RATIO	0.814	0.978	0.691	0.346	0.962	0.920	0.976	0.803	0.917	0.345
						SE			SE	NW	
MORRIS-001 (61)	TSP	94	67	63	52	49	46	46	43	42	42
	DATE	6/ 1/86	7/ 7/86	4/20/86	9/11/86	5/14/86	7/25/86	8/ 6/86	7/19/86	2/25/86	3/ 9/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	160	210	140	160	200	130	340	200
NEWARK	VEL (MPH)	11.7	8.0	9.0	15.6	6.9	8.2	9.3	5.7	18.8	8.7
	SPD (MPH)	14.1	8.9	10.5	15.8	10.4	9.1	10.4	6.5	20.0	11.4
	RATIO	0.831	0.896	0.853	0.985	0.663	0.902	0.899	0.887	0.939	0.766
METEOROLOGICAL SITE	DIR (DEG)	210	260	200	210	170	200	200	120	330	190
BRADLEY	VEL (MPH)	6.6	5.4	5.4	13.1	6.5	10.8	9.3	2.1	11.7	3.5
	SPD (MPH)	10.8	9.1	6.5	13.2	7.5	10.9	9.8	5.6	12.2	5.3
	RATIO	0.614	0.598	0.840	0.993	0.869	0.992	0.949	0.381	0.960	0.657
METEOROLOGICAL SITE	DIR (DEG)	200	240	170	220	90	200	230	130	330	230
BRIDGEPORT	VEL (MPH)	7.2	7.5	5.0	8.5	7.5	7.0	7.3	4.8	16.2	6.1
	SPD (MPH)	9.3	7.8	6.5	9.8	8.3	7.2	8.1	6.2	16.4	8.8
	RATIO	0.769	0.971	0.772	0.872	0.902	0.972	0.906	0.770	0.991	0.701
METEOROLOGICAL SITE	DIR (DEG)	240	280	210	240	240	230	240	80	320	230
WORCESTER	VEL (MPH)	8.2	9.9	3.0	15.8	0.3	10.6	9.9	3.1	11.2	6.3
	SPD (MPH)	10.1	11.5	6.0	15.8	6.8	11.2	10.4	5.2	11.6	7.9
	RATIO	0.814	0.862	0.504	0.997	0.040	0.948	0.956	0.593	0.962	0.803
					NW						
NAUGATUCK-001 (59)	TSP	113	91	85	84	82	82	82	79	75	75
	DATE	6/ 1/86	12/16/86	9/11/86	2/13/86	3/ 9/86	10/23/86	7/ 7/86	12/22/86	3/ 3/86	2/ 1/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	210	290	200	240	300	270	210	80
NEWARK	VEL (MPH)	11.7	5.5	15.6	11.0	8.7	8.9	8.0	6.8	3.5	3.6
	SPD (MPH)	14.1	6.6	15.8	12.2	11.4	9.6	8.9	8.1	7.8	9.3
	RATIO	0.831	0.825	0.985	0.897	0.766	0.926	0.896	0.845	0.445	0.385
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	310	190	240	260	210	220	230
BRADLEY	VEL (MPH)	6.6	1.8	13.1	9.0	3.5	7.5	5.4	5.1	2.2	1.7
	SPD (MPH)	10.8	3.4	13.2	10.8	5.3	9.6	9.1	5.5	3.9	5.9
	RATIO	0.614	0.522	0.993	0.839	0.657	0.780	0.598	0.935	0.556	0.283
METEOROLOGICAL SITE	DIR (DEG)	200	260	220	280	230	260	240	250	220	80
BRIDGEPORT	VEL (MPH)	7.2	0.6	8.5	9.4	6.1	5.9	7.5	7.5	5.5	4.8
	SPD (MPH)	9.3	3.3	9.8	9.6	8.8	6.3	7.8	7.8	6.0	6.6
	RATIO	0.769	0.184	0.872	0.971	0.701	0.940	0.971	0.962	0.913	0.725
METEOROLOGICAL SITE	DIR (DEG)	240	160	240	280	230	270	280	270	260	230
WORCESTER	VEL (MPH)	8.2	1.2	15.8	14.5	6.3	10.4	9.9	8.7	3.7	2.0
	SPD (MPH)	10.1	3.4	15.8	14.8	7.9	11.4	11.5	9.1	5.3	5.9
	RATIO	0.814	0.346	0.997	0.976	0.803	0.920	0.862	0.963	0.691	0.345

5

6

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
		NW							NW		SE
NEW BRITAIN-007 (61)	TSP	93	86	85	73	69	69	65	60	58	54
	DATE	2/25/86	12/16/86	6/ 1/86	7/ 7/86	1/ 2/86	12/22/86	9/11/86	2/13/86	2/ 1/86	7/19/86
METEOROLOGICAL SITE	DIR (DEG)	340	210	230	300	220	270	210	290	80	130
NEWARK	VEL (MPH)	18.8	5.5	11.7	8.0	5.6	6.8	15.6	11.0	3.6	5.7
	SPD (MPH)	20.0	6.6	14.1	8.9	7.3	8.1	15.8	12.2	9.3	6.5
	RATIO	0.939	0.825	0.831	0.896	0.765	0.845	0.985	0.897	0.385	0.887
METEOROLOGICAL SITE	DIR (DEG)	330	210	210	260	210	210	210	310	230	120
BRADLEY	VEL (MPH)	11.7	1.8	6.6	5.4	7.3	5.1	13.1	9.0	1.7	2.1
	SPD (MPH)	12.2	3.4	10.8	9.1	8.1	5.5	13.2	10.8	5.9	5.6
	RATIO	0.960	0.522	0.614	0.598	0.901	0.935	0.993	0.839	0.283	0.381
METEOROLOGICAL SITE	DIR (DEG)	330	260	200	240	250	250	220	280	80	130
BRIDGEPORT	VEL (MPH)	16.2	0.6	7.2	7.5	4.7	7.5	8.5	9.4	4.8	4.8
	SPD (MPH)	16.4	3.3	9.3	7.8	4.9	7.8	9.8	9.6	6.6	6.2
	RATIO	0.991	0.184	0.769	0.971	0.963	0.962	0.872	0.971	0.725	0.770
METEOROLOGICAL SITE	DIR (DEG)	320	160	240	280	230	270	240	280	230	80
WORCESTER	VEL (MPH)	11.2	1.2	8.2	9.9	9.4	8.7	15.8	14.5	2.0	3.1
	SPD (MPH)	11.6	3.4	10.1	11.5	9.6	9.1	15.8	14.8	5.9	5.2
	RATIO	0.962	0.346	0.814	0.862	0.978	0.963	0.997	0.976	0.345	0.593
NEW BRITAIN-008 (60)	TSP	100	95	91	84	72	72	70	58	58	57
	DATE	12/16/86	6/ 1/86	1/ 2/86	7/ 7/86	11/28/86	3/ 9/86	9/11/86	9/23/86	3/ 3/86	10/29/86
METEOROLOGICAL SITE	DIR (DEG)	210	230	220	300	240	200	210	220	210	210
NEWARK	VEL (MPH)	5.5	11.7	5.6	8.0	4.7	8.7	15.6	12.0	3.5	9.1
	SPD (MPH)	6.6	14.1	7.3	8.9	6.2	11.4	15.8	12.7	7.8	9.5
	RATIO	0.825	0.831	0.765	0.896	0.760	0.766	0.985	0.950	0.445	0.957
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	260	190	190	210	200	220	210
BRADLEY	VEL (MPH)	1.8	6.6	7.3	5.4	4.7	3.5	13.1	9.0	2.2	8.5
	SPD (MPH)	3.4	10.8	8.1	9.1	5.3	5.3	13.2	9.5	3.9	8.9
	RATIO	0.522	0.614	0.901	0.598	0.882	0.657	0.993	0.954	0.556	0.955
METEOROLOGICAL SITE	DIR (DEG)	260	200	250	240	260	230	220	240	220	230
BRIDGEPORT	VEL (MPH)	0.6	7.2	4.7	7.5	3.8	6.1	8.5	7.4	5.5	7.6
	SPD (MPH)	3.3	9.3	4.9	7.8	4.6	8.8	9.8	7.6	6.0	7.9
	RATIO	0.184	0.769	0.963	0.971	0.833	0.701	0.872	0.969	0.913	0.956
METEOROLOGICAL SITE	DIR (DEG)	160	240	230	280	260	230	240	240	260	250
WORCESTER	VEL (MPH)	1.2	8.2	9.4	9.9	9.2	6.3	15.8	8.3	3.7	10.3
	SPD (MPH)	3.4	10.1	9.6	11.5	9.5	7.9	15.8	9.1	5.3	10.6
	RATIO	0.346	0.814	0.978	0.862	0.969	0.803	0.997	0.912	0.691	0.972
NEW BRITAIN-009 (59)	TSP	93	83	78	66	62	60	58	54	52	52
	DATE	6/ 1/86	12/16/86	7/ 7/86	1/ 2/86	9/11/86	3/ 3/86	3/ 9/86	12/22/86	10/23/86	9/23/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	300	220	210	210	200	270	240	220
NEWARK	VEL (MPH)	11.7	5.5	8.0	5.6	15.6	3.5	8.7	6.8	8.9	12.0
	SPD (MPH)	14.1	6.6	8.9	7.3	15.8	7.8	11.4	8.1	9.6	12.7
	RATIO	0.831	0.825	0.896	0.765	0.985	0.445	0.766	0.845	0.926	0.950
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	210	210	220	190	210	240	200
BRADLEY	VEL (MPH)	6.6	1.8	5.4	7.3	13.1	2.2	3.5	5.1	7.5	9.0
	SPD (MPH)	10.8	3.4	9.1	8.1	13.2	3.9	5.3	5.5	9.6	9.5
	RATIO	0.614	0.522	0.598	0.901	0.993	0.556	0.657	0.935	0.780	0.954

4

9

8

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	200	260	240	250	220	220	230	250	260	240
BRIDGEPORT	VEL (MPH)	7.2	0.6	7.5	4.7	8.5	5.5	6.1	7.5	5.9	7.4
	SPD (MPH)	9.3	3.3	7.8	4.9	9.8	6.0	8.8	7.8	6.3	7.6
	RATIO	0.769	0.184	0.971	0.963	0.872	0.913	0.701	0.962	0.940	0.969
METEOROLOGICAL SITE	DIR (DEG)	240	160	280	230	240	260	230	270	270	240
WORCESTER	VEL (MPH)	8.2	1.2	9.9	9.4	15.8	3.7	6.3	8.7	10.4	8.3
	SPD (MPH)	10.1	3.4	11.5	9.6	15.8	5.3	7.9	9.1	11.4	9.1
	RATIO	0.814	0.346	0.862	0.978	0.997	0.691	0.803	0.963	0.920	0.912
NEW HAVEN-002 (51)	TSP	145	90	85	84	80	80	79	75	73	72
	DATE	6/ 1/86	7/ 7/86	3/ 3/86	3/ 9/86	2/13/86	11/28/86	10/23/86	12/10/86	2/25/86	12/22/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	210	200	290	240	240	270	340	270
NEWARK	VEL (MPH)	11.7	8.0	3.5	8.7	11.0	4.7	8.9	10.0	18.8	6.8
	SPD (MPH)	14.1	8.9	7.8	11.4	12.2	6.2	9.6	10.8	20.0	8.1
	RATIO	0.831	0.896	0.445	0.766	0.897	0.760	0.926	0.930	0.939	0.845
METEOROLOGICAL SITE	DIR (DEG)	210	260	220	190	310	190	240	310	330	210
BRADLEY	VEL (MPH)	6.6	5.4	2.2	3.5	9.0	4.7	7.5	3.2	11.7	5.1
	SPD (MPH)	10.8	9.1	3.9	5.3	10.8	5.3	9.6	5.5	12.2	5.5
	RATIO	0.614	0.598	0.556	0.657	0.839	0.882	0.780	0.581	0.960	0.935
METEOROLOGICAL SITE	DIR (DEG)	200	240	220	230	280	260	260	280	330	250
BRIDGEPORT	VEL (MPH)	7.2	7.5	5.5	6.1	9.4	3.8	5.9	8.8	16.2	7.5
	SPD (MPH)	9.3	7.8	6.0	8.8	9.6	4.6	6.3	9.6	16.4	7.8
	RATIO	0.769	0.971	0.913	0.701	0.971	0.833	0.940	0.918	0.991	0.962
METEOROLOGICAL SITE	DIR (DEG)	240	280	260	230	280	260	270	290	320	270
WORCESTER	VEL (MPH)	8.2	9.9	3.7	6.3	14.5	9.2	10.4	12.1	11.2	8.7
	SPD (MPH)	10.1	11.5	5.3	7.9	14.8	9.5	11.4	12.8	11.6	9.1
	RATIO	0.814	0.862	0.691	0.803	0.976	0.969	0.920	0.947	0.962	0.963
NEW HAVEN-013 (52)	TSP	111	111	101	86	84	81	79	72	67	67
	DATE	2/25/86	6/ 1/86	1/ 2/86	7/ 7/86	3/ 9/86	12/16/86	10/23/86	11/28/86	10/29/86	9/11/86
METEOROLOGICAL SITE	DIR (DEG)	340	230	220	300	200	210	240	240	210	210
NEWARK	VEL (MPH)	18.8	11.7	5.6	8.0	8.7	5.5	8.9	4.7	9.1	15.6
	SPD (MPH)	20.0	14.1	7.3	8.9	11.4	6.6	9.6	6.2	9.5	15.8
	RATIO	0.939	0.831	0.765	0.896	0.766	0.825	0.926	0.760	0.957	0.985
METEOROLOGICAL SITE	DIR (DEG)	330	210	210	260	190	210	240	190	210	210
BRADLEY	VEL (MPH)	11.7	6.6	7.3	5.4	3.5	1.8	7.5	4.7	8.5	13.1
	SPD (MPH)	12.2	10.8	8.1	9.1	5.3	3.4	9.6	5.3	8.9	13.2
	RATIO	0.960	0.614	0.901	0.598	0.657	0.522	0.780	0.882	0.955	0.993
METEOROLOGICAL SITE	DIR (DEG)	330	200	250	240	230	260	260	260	230	220
BRIDGEPORT	VEL (MPH)	16.2	7.2	4.7	7.5	6.1	0.6	5.9	3.8	7.6	8.5
	SPD (MPH)	16.4	9.3	4.9	7.8	8.8	3.3	6.3	4.6	7.9	9.8
	RATIO	0.991	0.769	0.963	0.971	0.701	0.184	0.940	0.833	0.956	0.872
METEOROLOGICAL SITE	DIR (DEG)	320	240	230	280	230	160	270	260	250	240
WORCESTER	VEL (MPH)	11.2	8.2	9.4	9.9	6.3	1.2	10.4	9.2	10.3	15.8
	SPD (MPH)	11.6	10.1	9.6	11.5	7.9	3.4	11.4	9.5	10.6	15.8
	RATIO	0.962	0.814	0.978	0.862	0.803	0.346	0.920	0.969	0.972	0.997

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
NORWALK-001 (60)	TSP	112	108	80	75	71	66	62	61	60	58
	DATE	1/ 2/86	6/ 1/86	3/ 3/86	12/16/86	7/ 7/86	9/11/86	2/25/86	12/22/86	10/23/86	3/ 9/86
METEOROLOGICAL SITE	DIR (DEG)	220	230	210	210	300	210	340	270	240	200
NEWARK	VEL (MPH)	5.6	11.7	3.5	5.5	8.0	15.6	18.8	6.8	8.9	8.7
	SPD (MPH)	7.3	14.1	7.8	6.6	8.9	15.8	20.0	8.1	9.6	11.4
	RATIO	0.765	0.831	0.445	0.825	0.896	0.985	0.939	0.845	0.926	0.766
METEOROLOGICAL SITE	DIR (DEG)	210	210	220	210	260	210	330	210	240	190
BRADLEY	VEL (MPH)	7.3	6.6	2.2	1.8	5.4	13.1	11.7	5.1	7.5	3.5
	SPD (MPH)	8.1	10.8	3.9	3.4	9.1	13.2	12.2	5.5	9.6	5.3
	RATIO	0.901	0.614	0.556	0.522	0.598	0.993	0.960	0.935	0.780	0.657
METEOROLOGICAL SITE	DIR (DEG)	250	200	220	260	240	220	330	250	260	230
BRIDGEPORT	VEL (MPH)	4.7	7.2	5.5	0.6	7.5	8.5	16.2	7.5	5.9	6.1
	SPD (MPH)	4.9	9.3	6.0	3.3	7.8	9.8	16.4	7.8	6.3	8.8
	RATIO	0.963	0.769	0.913	0.184	0.971	0.872	0.991	0.962	0.940	0.701
METEOROLOGICAL SITE	DIR (DEG)	230	240	260	160	280	240	320	270	270	230
WORCESTER	VEL (MPH)	9.4	8.2	3.7	1.2	9.9	15.8	11.2	8.7	10.4	6.3
	SPD (MPH)	9.6	10.1	5.3	3.4	11.5	15.8	11.6	9.1	11.4	7.9
	RATIO	0.978	0.814	0.691	0.346	0.862	0.997	0.962	0.963	0.920	0.803
NORWALK-005 (53)	TSP	134	109	101	99	98	95	93	87	86	82
	DATE	1/ 2/86	6/ 1/86	12/22/86	12/16/86	11/28/86	11/10/86	2/25/86	9/29/86	7/ 7/86	6/25/86
METEOROLOGICAL SITE	DIR (DEG)	220	230	270	210	240	320	340	220	300	320
NEWARK	VEL (MPH)	5.6	11.7	6.8	5.5	4.7	10.2	18.8	9.9	8.0	18.2
	SPD (MPH)	7.3	14.1	8.1	6.6	6.2	11.8	20.0	10.4	8.9	19.0
	RATIO	0.765	0.831	0.845	0.825	0.760	0.862	0.939	0.958	0.896	0.957
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	210	190	320	330	200	260	300
BRADLEY	VEL (MPH)	7.3	6.6	5.1	1.8	4.7	10.7	11.7	9.1	5.4	11.8
	SPD (MPH)	8.1	10.8	5.5	3.4	5.3	11.9	12.2	9.3	9.1	12.2
	RATIO	0.901	0.614	0.935	0.522	0.882	0.896	0.960	0.971	0.598	0.963
METEOROLOGICAL SITE	DIR (DEG)	250	200	250	260	260	340	330	250	240	300
BRIDGEPORT	VEL (MPH)	4.7	7.2	7.5	0.6	3.8	7.9	16.2	6.5	7.5	8.6
	SPD (MPH)	4.9	9.3	7.8	3.3	4.6	8.5	16.4	6.6	7.8	10.2
	RATIO	0.963	0.769	0.962	0.184	0.833	0.933	0.991	0.985	0.971	0.847
METEOROLOGICAL SITE	DIR (DEG)	230	240	270	160	260	300	320	260	280	310
WORCESTER	VEL (MPH)	9.4	8.2	8.7	1.2	9.2	13.5	11.2	12.5	9.9	11.6
	SPD (MPH)	9.6	10.1	9.1	3.4	9.5	13.8	11.6	12.7	11.5	12.5
	RATIO	0.978	0.814	0.963	0.346	0.969	0.978	0.962	0.991	0.862	0.928
NORWALK-012 (56)	TSP	128	118	85	83	79	73	68	66	63	60
	DATE	1/ 2/86	6/ 1/86	3/ 3/86	7/ 7/86	10/23/86	11/28/86	10/29/86	4/14/86	9/11/86	2/25/86
METEOROLOGICAL SITE	DIR (DEG)	220	230	210	300	240	240	210	150	210	340
NEWARK	VEL (MPH)	5.6	11.7	3.5	8.0	8.9	4.7	9.1	4.7	15.6	18.8
	SPD (MPH)	7.3	14.1	7.8	8.9	9.6	6.2	9.5	10.1	15.8	20.0
	RATIO	0.765	0.831	0.445	0.896	0.926	0.760	0.957	0.467	0.985	0.939
METEOROLOGICAL SITE	DIR (DEG)	210	210	220	260	240	190	210	170	210	330
BRADLEY	VEL (MPH)	7.3	6.6	2.2	5.4	7.5	4.7	8.5	1.6	13.1	11.7
	SPD (MPH)	8.1	10.8	3.9	9.1	9.6	5.3	8.9	5.0	13.2	12.2
	RATIO	0.901	0.614	0.556	0.598	0.780	0.882	0.955	0.323	0.993	0.960

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	250	200	220	240	260	260	230	150	220	330
BRIDGEPORT	VEL (MPH)	4.7	7.2	5.5	7.5	5.9	3.8	7.6	5.7	8.5	16.2
	SPD (MPH)	4.9	9.3	6.0	7.8	6.3	4.6	7.9	8.1	9.8	16.4
	RATIO	0.963	0.769	0.913	0.971	0.940	0.833	0.956	0.702	0.872	0.991
METEOROLOGICAL SITE	DIR (DEG)	230	240	260	280	270	260	250	300	240	320
WORCESTER	VEL (MPH)	9.4	8.2	3.7	9.9	10.4	9.2	10.3	3.1	15.8	11.2
	SPD (MPH)	9.6	10.1	5.3	11.5	11.4	9.5	10.6	5.0	15.8	11.6
	RATIO	0.978	0.814	0.691	0.862	0.920	0.969	0.972	0.617	0.997	0.962
NORWICH-002 (55)	TSP	140	87	86	82	82	75	72	70	69	66
	DATE	7/ 1/86	3/ 9/86	10/23/86	6/ 1/86	9/11/86	2/13/86	1/ 2/86	2/25/86	6/19/86	12/16/86
METEOROLOGICAL SITE	DIR (DEG)	140	200	240	230	210	290	220	340	230	210
NEWARK	VEL (MPH)	3.9	8.7	8.9	11.7	15.6	11.0	5.6	18.8	3.6	5.5
	SPD (MPH)	8.6	11.4	9.6	14.1	15.8	12.2	7.3	20.0	12.8	6.6
	RATIO	0.452	0.766	0.926	0.831	0.985	0.897	0.765	0.939	0.278	0.825
METEOROLOGICAL SITE	DIR (DEG)	220	190	240	210	210	310	210	330	220	210
BRADLEY	VEL (MPH)	4.1	3.5	7.5	6.6	13.1	9.0	7.3	11.7	7.6	1.8
	SPD (MPH)	6.5	5.3	9.6	10.8	13.2	10.8	8.1	12.2	9.5	3.4
	RATIO	0.631	0.657	0.780	0.614	0.993	0.839	0.901	0.960	0.798	0.522
METEOROLOGICAL SITE	DIR (DEG)	190	230	260	200	220	280	250	330	240	260
BRIDGEPORT	VEL (MPH)	2.1	6.1	5.9	7.2	8.5	9.4	4.7	16.2	8.2	0.6
	SPD (MPH)	6.8	8.8	6.3	9.3	9.8	9.6	4.9	16.4	9.1	3.3
	RATIO	0.308	0.701	0.940	0.769	0.872	0.971	0.963	0.991	0.905	0.184
METEOROLOGICAL SITE	DIR (DEG)	290	230	270	240	240	280	230	320	270	160
WORCESTER	VEL (MPH)	4.4	6.3	10.4	8.2	15.8	14.5	9.4	11.2	10.9	1.2
	SPD (MPH)	8.6	7.9	11.4	10.1	15.8	14.8	9.6	11.6	11.4	3.4
	RATIO	0.508	0.803	0.920	0.814	0.997	0.976	0.978	0.962	0.958	0.346
STAMFORD-001 (58)	TSP	102	101	98	92	88	87	84	82	78	71
	DATE	6/ 1/86	9/11/86	7/ 7/86	10/23/86	7/25/86	12/16/86	6/19/86	8/ 6/86	3/ 3/86	9/29/86
METEOROLOGICAL SITE	DIR (DEG)	230	210	300	240	160	210	230	200	210	220
NEWARK	VEL (MPH)	11.7	15.6	8.0	8.9	8.2	5.5	3.6	9.3	3.5	9.9
	SPD (MPH)	14.1	15.8	8.9	9.6	9.1	6.6	12.8	10.4	7.8	10.4
	RATIO	0.831	0.985	0.896	0.926	0.902	0.825	0.278	0.899	0.445	0.958
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	240	200	210	220	200	220	200
BRADLEY	VEL (MPH)	6.6	13.1	5.4	7.5	10.8	1.8	7.6	9.3	2.2	9.1
	SPD (MPH)	10.8	13.2	9.1	9.6	10.9	3.4	9.5	9.8	3.9	9.3
	RATIO	0.614	0.993	0.598	0.780	0.992	0.522	0.798	0.949	0.556	0.971
METEOROLOGICAL SITE	DIR (DEG)	200	220	240	260	200	260	240	230	220	250
BRIDGEPORT	VEL (MPH)	7.2	8.5	7.5	5.9	7.0	0.6	8.2	7.3	5.5	6.5
	SPD (MPH)	9.3	9.8	7.8	6.3	7.2	3.3	9.1	8.1	6.0	6.6
	RATIO	0.769	0.872	0.971	0.940	0.972	0.184	0.905	0.906	0.913	0.985
METEOROLOGICAL SITE	DIR (DEG)	240	240	280	270	230	160	270	240	260	260
WORCESTER	VEL (MPH)	8.2	15.8	9.9	10.4	10.6	1.2	10.9	9.9	3.7	12.5
	SPD (MPH)	10.1	15.8	11.5	11.4	11.2	3.4	11.4	10.4	5.3	12.7
	RATIO	0.814	0.997	0.862	0.920	0.948	0.346	0.958	0.956	0.691	0.991

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
STAMFORD-007 (57)	TSP	114	109	108	103	96	83	76	73	68	64
	DATE	6/ 1/86	5/ 2/86	10/23/86	2/25/86	7/ 7/86	10/29/86	12/16/86	11/16/86	6/25/86	11/10/86
METEOROLOGICAL SITE	DIR (DEG)	230	310	240	340	300	210	210	260	320	320
NEWARK	VEL (MPH)	11.7	16.5	8.9	18.8	8.0	9.1	5.5	5.6	18.2	10.2
	SPD (MPH)	14.1	18.8	9.6	20.0	8.9	9.5	6.6	7.3	19.0	11.8
	RATIO	0.831	0.878	0.926	0.939	0.896	0.957	0.825	0.758	0.957	0.862
METEOROLOGICAL SITE	DIR (DEG)	210	300	240	330	260	210	210	340	300	320
BRADLEY	VEL (MPH)	6.6	11.8	7.5	11.7	5.4	8.5	1.8	1.2	11.8	10.7
	SPD (MPH)	10.8	13.5	9.6	12.2	9.1	8.9	3.4	4.9	12.2	11.9
	RATIO	0.614	0.877	0.780	0.960	0.598	0.955	0.522	0.254	0.963	0.896
METEOROLOGICAL SITE	DIR (DEG)	200	300	260	330	240	230	260	300	300	340
BRIDGEPORT	VEL (MPH)	7.2	11.6	5.9	16.2	7.5	7.6	0.6	2.6	8.6	7.9
	SPD (MPH)	9.3	11.8	6.3	16.4	7.8	7.9	3.3	3.6	10.2	8.5
	RATIO	0.769	0.982	0.940	0.991	0.971	0.956	0.184	0.732	0.847	0.933
METEOROLOGICAL SITE	DIR (DEG)	240	290	270	320	280	250	160	300	310	300
WORCESTER	VEL (MPH)	8.2	13.9	10.4	11.2	9.9	10.3	1.2	5.3	11.6	13.5
	SPD (MPH)	10.1	14.4	11.4	11.6	11.5	10.6	3.4	6.2	12.5	13.8
	RATIO	0.814	0.966	0.920	0.962	0.862	0.972	0.346	0.854	0.928	0.978
STAMFORD-021 (56)	TSP	121	109	91	87	75	74	69	69	67	62
	DATE	1/ 2/86	6/ 1/86	7/ 7/86	12/16/86	4/14/86	3/ 3/86	10/29/86	9/11/86	5/ 2/86	5/ 8/86
METEOROLOGICAL SITE	DIR (DEG)	220	230	300	210	150	210	210	210	310	50
NEWARK	VEL (MPH)	5.6	11.7	8.0	5.5	4.7	3.5	9.1	15.6	16.5	10.1
	SPD (MPH)	7.3	14.1	8.9	6.6	10.1	7.8	9.5	15.8	18.8	14.8
	RATIO	0.765	0.831	0.896	0.825	0.467	0.445	0.957	0.985	0.878	0.684
METEOROLOGICAL SITE	DIR (DEG)	210	210	260	210	170	220	210	210	300	40
BRADLEY	VEL (MPH)	7.3	6.6	5.4	1.8	1.6	2.2	8.5	13.1	11.8	10.5
	SPD (MPH)	8.1	10.8	9.1	3.4	5.0	3.9	8.9	13.2	13.5	11.5
	RATIO	0.901	0.614	0.598	0.522	0.323	0.556	0.955	0.993	0.877	0.917
METEOROLOGICAL SITE	DIR (DEG)	250	200	240	260	150	220	230	220	300	60
BRIDGEPORT	VEL (MPH)	4.7	7.2	7.5	0.6	5.7	5.5	7.6	8.5	11.6	8.4
	SPD (MPH)	4.9	9.3	7.8	3.3	8.1	6.0	7.9	9.8	11.8	9.8
	RATIO	0.963	0.769	0.971	0.184	0.702	0.913	0.956	0.872	0.982	0.861
METEOROLOGICAL SITE	DIR (DEG)	230	240	280	160	300	260	250	240	290	60
WORCESTER	VEL (MPH)	9.4	8.2	9.9	1.2	3.1	3.7	10.3	15.8	13.9	8.1
	SPD (MPH)	9.6	10.1	11.5	3.4	5.0	5.3	10.6	15.8	14.4	8.3
	RATIO	0.978	0.814	0.862	0.346	0.617	0.691	0.972	0.997	0.966	0.967
STRATFORD-005 (59)	TSP	147	143	111	98	98	89	72	72	71	67
	DATE	2/25/86	1/ 2/86	6/ 1/86	12/16/86	7/ 7/86	10/23/86	11/28/86	3/ 3/86	3/ 9/86	4/ 2/86
METEOROLOGICAL SITE	DIR (DEG)	340	220	230	210	300	240	240	210	200	340
NEWARK	VEL (MPH)	18.8	5.6	11.7	5.5	8.0	8.9	4.7	3.5	8.7	9.2
	SPD (MPH)	20.0	7.3	14.1	6.6	8.9	9.6	6.2	7.8	11.4	13.9
	RATIO	0.939	0.765	0.831	0.825	0.896	0.926	0.760	0.445	0.766	0.657
METEOROLOGICAL SITE	DIR (DEG)	330	210	210	210	260	240	190	220	190	330
BRADLEY	VEL (MPH)	11.7	7.3	6.6	1.8	5.4	7.5	4.7	2.2	3.5	4.7
	SPD (MPH)	12.2	8.1	10.8	3.4	9.1	9.6	5.3	3.9	5.3	8.6
	RATIO	0.960	0.901	0.614	0.522	0.598	0.780	0.882	0.556	0.657	0.544

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	330	250	200	260	240	260	260	220	230	340
	VEL (MPH)	16.2	4.7	7.2	0.6	7.5	5.9	3.8	5.5	6.1	9.4
	SPD (MPH)	16.4	4.9	9.3	3.3	7.8	6.3	4.6	6.0	8.8	10.4
	RATIO	0.991	0.963	0.769	0.184	0.971	0.940	0.833	0.913	0.701	0.911
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	320	230	240	160	280	270	260	260	230	310
	VEL (MPH)	11.2	9.4	8.2	1.2	9.9	10.4	9.2	3.7	6.3	8.2
	SPD (MPH)	11.6	9.6	10.1	3.4	11.5	11.4	9.5	5.3	7.9	12.5
	RATIO	0.962	0.978	0.814	0.346	0.862	0.920	0.969	0.691	0.803	0.659
TORRINGTON-001 (60)	TSP	135	94	83	80	79	74	71	69	69	68
	DATE	1/ 2/86	2/13/86	6/ 1/86	7/ 7/86	3/ 3/86	12/22/86	2/25/86	2/ 1/86	12/16/86	9/11/86
METEOROLOGICAL SITE NEWARK	DIR (DEG)	220	290	230	300	210	270	340	80	210	210
	VEL (MPH)	5.6	11.0	11.7	8.0	3.5	6.8	18.8	3.6	5.5	15.6
	SPD (MPH)	7.3	12.2	14.1	8.9	7.8	8.1	20.0	9.3	6.6	15.8
	RATIO	0.765	0.897	0.831	0.896	0.445	0.845	0.939	0.385	0.825	0.985
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	310	210	260	220	210	330	230	210	210
	VEL (MPH)	7.3	9.0	6.6	5.4	2.2	5.1	11.7	1.7	1.8	13.1
	SPD (MPH)	8.1	10.8	10.8	9.1	3.9	5.5	12.2	5.9	3.4	13.2
	RATIO	0.901	0.839	0.614	0.598	0.556	0.935	0.960	0.283	0.522	0.993
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	250	280	200	240	220	250	330	80	260	220
	VEL (MPH)	4.7	9.4	7.2	7.5	5.5	7.5	16.2	4.8	0.6	8.5
	SPD (MPH)	4.9	9.6	9.3	7.8	6.0	7.8	16.4	6.6	3.3	9.8
	RATIO	0.963	0.971	0.769	0.971	0.913	0.962	0.991	0.725	0.184	0.872
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	230	280	240	280	260	270	320	230	160	240
	VEL (MPH)	9.4	14.5	8.2	9.9	3.7	8.7	11.2	2.0	1.2	15.8
	SPD (MPH)	9.6	14.8	10.1	11.5	5.3	9.1	11.6	5.9	3.4	15.8
	RATIO	0.978	0.976	0.814	0.862	0.691	0.963	0.962	0.345	0.346	0.997
VOLUNTOWN-001 (60)	TSP	112	76	49	44	42	41	39	35	34	34
	DATE	6/ 1/86	7/ 7/86	6/19/86	10/23/86	7/25/86	9/23/86	5/ 2/86	5/26/86	9/11/86	3/ 9/86
METEOROLOGICAL SITE NEWARK	DIR (DEG)	230	300	230	240	160	220	310	110	210	200
	VEL (MPH)	11.7	8.0	3.6	8.9	8.2	12.0	16.5	9.0	15.6	8.7
	SPD (MPH)	14.1	8.9	12.8	9.6	9.1	12.7	18.8	13.1	15.8	11.4
	RATIO	0.831	0.896	0.278	0.926	0.902	0.950	0.878	0.687	0.985	0.766
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	260	220	240	200	200	300	70	210	190
	VEL (MPH)	6.6	5.4	7.6	7.5	10.8	9.0	11.8	4.8	13.1	3.5
	SPD (MPH)	10.8	9.1	9.5	9.6	10.9	9.5	13.5	9.8	13.2	5.3
	RATIO	0.614	0.598	0.798	0.780	0.992	0.954	0.877	0.494	0.993	0.657
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	200	240	240	260	200	240	300	90	220	230
	VEL (MPH)	7.2	7.5	8.2	5.9	7.0	7.4	11.6	4.2	8.5	6.1
	SPD (MPH)	9.3	7.8	9.1	6.3	7.2	7.6	11.8	9.1	9.8	8.8
	RATIO	0.769	0.971	0.905	0.940	0.972	0.969	0.982	0.458	0.872	0.701
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	240	280	270	270	230	240	290	90	240	230
	VEL (MPH)	8.2	9.9	10.9	10.4	10.6	8.3	13.9	5.7	15.8	6.3
	SPD (MPH)	10.1	11.5	11.4	11.4	11.2	9.1	14.4	7.6	15.8	7.9
	RATIO	0.814	0.862	0.958	0.920	0.948	0.912	0.966	0.749	0.997	0.803

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)		RANK	1	2	3	4	5	6	7	8	9	10
WALLINGFORD-001 (60)		TSP	144	125	123	117	106	102	95	92	84	83
		DATE	2/13/86	12/10/86	12/16/86	6/ 1/86	1/ 2/86	2/25/86	3/ 3/86	7/ 7/86	3/ 9/86	12/22/86
	METEOROLOGICAL SITE NEWARK	DIR (DEG)	290	270	210	230	220	340	210	300	200	270
		VEL (MPH)	11.0	10.0	5.5	11.7	5.6	18.8	3.5	8.0	8.7	6.8
		SPD (MPH)	12.2	10.8	6.6	14.1	7.3	20.0	7.8	8.9	11.4	8.1
		RATIO	0.897	0.930	0.825	0.831	0.765	0.939	0.445	0.896	0.766	0.845
	METEOROLOGICAL SITE BRADLEY	DIR (DEG)	310	310	210	210	210	330	220	260	190	210
		VEL (MPH)	9.0	3.2	1.8	6.6	7.3	11.7	2.2	5.4	3.5	5.1
		SPD (MPH)	10.8	5.5	3.4	10.8	8.1	12.2	3.9	9.1	5.3	5.5
		RATIO	0.839	0.581	0.522	0.614	0.901	0.960	0.556	0.598	0.657	0.935
	METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	280	280	260	200	250	330	220	240	230	250
		VEL (MPH)	9.4	8.8	0.6	7.2	4.7	16.2	5.5	7.5	6.1	7.5
		SPD (MPH)	9.6	9.6	3.3	9.3	4.9	16.4	6.0	7.8	8.8	7.8
		RATIO	0.971	0.918	0.184	0.769	0.963	0.991	0.913	0.971	0.701	0.962
	METEOROLOGICAL SITE WORCESTER	DIR (DEG)	280	290	160	240	230	320	260	280	230	270
		VEL (MPH)	14.5	12.1	1.2	8.2	9.4	11.2	3.7	9.9	6.3	8.7
		SPD (MPH)	14.8	12.8	3.4	10.1	9.6	11.6	5.3	11.5	7.9	9.1
		RATIO	0.976	0.947	0.346	0.814	0.978	0.962	0.691	0.862	0.803	0.963
WATERBURY-005 (61)		TSP	127	110	108	100	99	98	97	86	82	81
		DATE	12/16/86	2/25/86	1/ 2/86	12/22/86	10/23/86	6/ 1/86	3/ 3/86	7/ 7/86	2/ 1/86	2/13/86
	METEOROLOGICAL SITE NEWARK	DIR (DEG)	210	340	220	270	240	230	210	300	80	290
		VEL (MPH)	5.5	18.8	5.6	6.8	8.9	11.7	3.5	8.0	3.6	11.0
		SPD (MPH)	6.6	20.0	7.3	8.1	9.6	14.1	7.8	8.9	9.3	12.2
		RATIO	0.825	0.939	0.765	0.845	0.926	0.831	0.445	0.896	0.385	0.897
	METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	330	210	210	240	210	220	260	230	310
		VEL (MPH)	1.8	11.7	7.3	5.1	7.5	6.6	2.2	5.4	1.7	9.0
		SPD (MPH)	3.4	12.2	8.1	5.5	9.6	10.8	3.9	9.1	5.9	10.8
		RATIO	0.522	0.960	0.901	0.935	0.780	0.614	0.556	0.598	0.283	0.839
	METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	260	330	250	250	260	200	220	240	80	280
		VEL (MPH)	0.6	16.2	4.7	7.5	5.9	7.2	5.5	7.5	4.8	9.4
		SPD (MPH)	3.3	16.4	4.9	7.8	6.3	9.3	6.0	7.8	6.6	9.6
		RATIO	0.184	0.991	0.963	0.962	0.940	0.769	0.913	0.971	0.725	0.971
	METEOROLOGICAL SITE WORCESTER	DIR (DEG)	160	320	230	270	270	240	260	280	230	280
		VEL (MPH)	1.2	11.2	9.4	8.7	10.4	8.2	3.7	9.9	2.0	14.5
		SPD (MPH)	3.4	11.6	9.6	9.1	11.4	10.1	5.3	11.5	5.9	14.8
		RATIO	0.346	0.962	0.978	0.963	0.920	0.814	0.691	0.862	0.345	0.976
WATERBURY-006 (57)		TSP	101	91	76	71	70	67	66	61	59	57
		DATE	12/16/86	6/ 1/86	7/ 7/86	3/ 3/86	1/ 2/86	9/11/86	3/ 9/86	2/25/86	4/ 8/86	10/23/86
	METEOROLOGICAL SITE NEWARK	DIR (DEG)	210	230	300	210	220	210	200	340	250	240
		VEL (MPH)	5.5	11.7	8.0	3.5	5.6	15.6	8.7	18.8	8.9	8.9
		SPD (MPH)	6.6	14.1	8.9	7.8	7.3	15.8	11.4	20.0	13.5	9.6
		RATIO	0.825	0.831	0.896	0.445	0.765	0.985	0.766	0.939	0.657	0.926
	METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	210	260	220	210	210	190	330	200	240
		VEL (MPH)	1.8	6.6	5.4	2.2	7.3	13.1	3.5	11.7	4.7	7.5
		SPD (MPH)	3.4	10.8	9.1	3.9	8.1	13.2	5.3	12.2	8.5	9.6
		RATIO	0.522	0.614	0.598	0.556	0.901	0.993	0.657	0.960	0.553	0.780

TABLE 11, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	260	200	240	220	250	220	230	330	170	260
BRIDGEPORT	VEL (MPH)	0.6	7.2	7.5	5.5	4.7	8.5	6.1	16.2	1.9	5.9
	SPD (MPH)	3.3	9.3	7.8	6.0	4.9	9.8	8.8	16.4	5.8	6.3
	RATIO	0.184	0.769	0.971	0.913	0.963	0.872	0.701	0.991	0.331	0.940
METEOROLOGICAL SITE	DIR (DEG)	160	240	280	260	230	240	230	320	180	270
WORCESTER	VEL (MPH)	1.2	8.2	9.9	3.7	9.4	15.8	6.3	11.2	3.2	10.4
	SPD (MPH)	3.4	10.1	11.5	5.3	9.6	15.8	7.9	11.6	6.5	11.4
	RATIO	0.346	0.814	0.862	0.691	0.978	0.997	0.803	0.962	0.500	0.920
WATERBURY-007 (60)	TSP	141	129	124	122	115	106	104	100	97	91
	DATE	1/ 2/86	12/16/86	2/ 1/86	2/25/86	3/ 3/86	10/23/86	6/ 1/86	11/28/86	12/22/86	7/ 7/86
METEOROLOGICAL SITE	DIR (DEG)	220	210	80	340	210	240	230	240	270	300
NEWARK	VEL (MPH)	5.6	5.5	3.6	18.8	3.5	8.9	11.7	4.7	6.8	8.0
	SPD (MPH)	7.3	6.6	9.3	20.0	7.8	9.6	14.1	6.2	8.1	8.9
	RATIO	0.765	0.825	0.385	0.939	0.445	0.926	0.831	0.760	0.845	0.896
METEOROLOGICAL SITE	DIR (DEG)	210	210	230	330	220	240	210	190	210	260
BRADLEY	VEL (MPH)	7.3	1.8	1.7	11.7	2.2	7.5	6.6	4.7	5.1	5.4
	SPD (MPH)	8.1	3.4	5.9	12.2	3.9	9.6	10.8	5.3	5.5	9.1
	RATIO	0.901	0.522	0.283	0.960	0.556	0.780	0.614	0.882	0.935	0.598
METEOROLOGICAL SITE	DIR (DEG)	250	260	80	330	220	260	200	260	250	240
BRIDGEPORT	VEL (MPH)	4.7	0.6	4.8	16.2	5.5	5.9	7.2	3.8	7.5	7.5
	SPD (MPH)	4.9	3.3	6.6	16.4	6.0	6.3	9.3	4.6	7.8	7.8
	RATIO	0.963	0.184	0.725	0.991	0.913	0.940	0.769	0.833	0.962	0.971
METEOROLOGICAL SITE	DIR (DEG)	230	160	230	320	260	270	240	260	270	280
WORCESTER	VEL (MPH)	9.4	1.2	2.0	11.2	3.7	10.4	8.2	9.2	8.7	9.9
	SPD (MPH)	9.6	3.4	5.9	11.6	5.3	11.4	10.1	9.5	9.1	11.5
	RATIO	0.978	0.346	0.345	0.962	0.691	0.920	0.814	0.969	0.963	0.862
WILLIMANTIC-002 (57)	TSP	108	105	100	98	95	91	90	81	81	70
	DATE	12/16/86	11/16/86	2/25/86	6/ 1/86	7/ 1/86	2/13/86	12/10/86	1/ 2/86	12/22/86	5/ 2/86
METEOROLOGICAL SITE	DIR (DEG)	210	260	340	230	140	290	270	220	270	310
NEWARK	VEL (MPH)	5.5	5.6	18.8	11.7	3.9	11.0	10.0	5.6	6.8	16.5
	SPD (MPH)	6.6	7.3	20.0	14.1	8.6	12.2	10.8	7.3	8.1	18.8
	RATIO	0.825	0.758	0.939	0.831	0.452	0.897	0.930	0.765	0.845	0.878
METEOROLOGICAL SITE	DIR (DEG)	210	340	330	210	220	310	310	210	210	300
BRADLEY	VEL (MPH)	1.8	1.2	11.7	6.6	4.1	9.0	3.2	7.3	5.1	11.8
	SPD (MPH)	3.4	4.9	12.2	10.8	6.5	10.8	5.5	8.1	5.5	13.5
	RATIO	0.522	0.254	0.960	0.614	0.631	0.839	0.581	0.901	0.935	0.877
METEOROLOGICAL SITE	DIR (DEG)	260	300	330	200	190	280	280	250	250	300
BRIDGEPORT	VEL (MPH)	0.6	2.6	16.2	7.2	2.1	9.4	8.8	4.7	7.5	11.6
	SPD (MPH)	3.3	3.6	16.4	9.3	6.8	9.6	9.6	4.9	7.8	11.8
	RATIO	0.184	0.732	0.991	0.769	0.308	0.971	0.918	0.963	0.962	0.982
METEOROLOGICAL SITE	DIR (DEG)	160	300	320	240	290	280	290	230	270	290
WORCESTER	VEL (MPH)	1.2	5.3	11.2	8.2	4.4	14.5	12.1	9.4	8.7	13.9
	SPD (MPH)	3.4	6.2	11.6	10.1	8.6	14.8	12.8	9.6	9.1	14.4
	RATIO	0.346	0.854	0.962	0.814	0.508	0.976	0.947	0.978	0.963	0.966

III. SULFUR DIOXIDE

HEALTH EFFECTS

Sulfur oxides are gases that come from the burning of sulfur-containing fuel, mainly coal and oil-derived fuels, and also from the smelting of metals and from certain industrial processes. They have a distinctive odor. Sulfur dioxide (SO_2) comprises about 95 percent of these gases, so scientists use a test for SO_2 alone as a measure of all sulfur oxides.

Exposure to high levels of sulfur oxides can cause an obstruction of breathing that doctors call "pulmonary flow resistance." The amount of breathing obstruction has a direct relation to the amount of sulfur compounds in the air. The effect of sulfur pollution is enhanced by the presence of other pollutants, especially particulates and oxidants. Moreover, the harm that results from two or more pollutants is more than additive. Each augments the other, and the combined effect is greater than the sum of the effects that each alone would have.

Many types of respiratory disease are associated with sulfur oxides:coughs and colds, asthma, bronchitis, and emphysema. Some researchers believe that the harm is not only due to the sulfur oxide gases but also other sulfur compounds that accompany the oxides.

CONCLUSIONS

Sulfur dioxide concentrations in 1986 did not exceed any federal primary or secondary standards. Measured concentrations were substantially below the 365 $\mu g/m^3$ primary 24-hour standard and well below both the 80 $\mu g/m^3$ primary annual standard and the 1300 $\mu g/m^3$ secondary 3-hour standard.

METHOD OF MEASUREMENT

The DEP Air Monitoring Unit used the pulsed fluorescence method (Teco instruments) to continuously measure sulfur dioxide levels at all 18 sites in 1986.

DISCUSSION OF DATA

Monitoring Network - Eighteen continuous SO_2 monitors were used to record data in fourteen towns during 1986 (see Figure 5):

Bridgeport 012
Bridgeport 123
Danbury 123
East Hartford 005
East Haven 003
Enfield 005
Greenwich 017
Groton 007
Hartford 123
Milford 002
New Britain 011
New Haven 017
New Haven 123
Norwalk 013
Stamford 025
Stamford 123
Waterbury 008
Waterbury 123

All of these sites telemetered the data to the central computer in Hartford three times each day (i.e., at 0700, 1400, and 2400 hours)..

Precision and Accuracy - 581 precision checks were made on SO_2 monitors in 1986, yielding 95% probability limits ranging from -10% to + 10%. Accuracy is determined by introducing a known amount of SO_2 into each of the monitors. Three different concentration levels are tested: low, medium, and high. The 95% probability limits for accuracy based on 19 audits were: low, -7% to + 7%; medium, -4% to + 8%; and high, -5% to + 6%.

Annual Averages - SO_2 levels were below the primary annual standard of 80 µg/m³ at all sites in 1986 (see Table 12). The annual average SO_2 levels decreased at 8 of the 16 monitoring sites that had adequate data in both 1985 and 1986 to produce valid annual averages. Five sites showed increases from 1985 to 1986. Hartford 123 experienced the highest increase (12 µg/m³). New Haven 123 showed the largest annual average decrease (5 µg/m³).

Statistical Projections - A statistical analysis of the sulfur dioxide data is presented in Table 13. This analysis provides information to compensate for any loss of data caused by instrumentation problems. The format of Table 13 is the same as that used to present the total suspended particulate annual averages (see Table 6). However, Table 13 gives the annual arithmetic mean of the valid 24-hour SO_2 averages to allow direct comparison to the annual SO_2 standards. The 95% limits and standard deviations are also arithmetic calculations. Since the distribution of the SO_2 data tends to be lognormal, the geometric means and standard deviations were used to predict the number of days the 24-hour standard of 365 µg/m³would be exceeded at each site if sampling had been conducted every day.

It is important to note that these statistical tests require that the data be random for the test to be valid. This means that an equal number of samples must be collected in each season of the year and on each day of the week. For the 18 sites that operated in 1985, the distribution and quantity of SO_2 data were adequate -- except for the Waterbury 008 site. The data for these sites indicate that there were no violations of the primary SO_2 standard in Connecticut in the last three years. However, statistical predictions of one day exceeding the primary 24-hour standard (365 µg/m³) did occur during this period.at three sites. This indicates that a slight increase in SO_2 emissions might have jeopardized the attainment of the standard at these sites. Two days over the standard are required for the standard to be violated.

24-Hour Averages - Table 14 presents the first and second high calendar day average concentrations recorded at each monitoring site. In 1986 no sites recorded SO_2 levels in excess of the 24-hour primary standard of 365 µg/m³. Second high calendar day average concentrations increased at 11 of the 16 SO_2 monitoring sites that had a sufficient distribution and quantity of data in both 1985 and 1986. The increases ranged from 1 µg/m³ at Norwalk 013 to 101 µg/m³ at Milford 002.

Current EPA policy bases compliance with the primary 24-hour SO_2 standard on calendar day averages. Assessment of compliance is based on the second highest calendar day average in the year. Running averages are averages computed for the 24-hour periods ending at every hour. If running averages were used, assessment of compliance would be based on the value of the second highest of the two highest non-overlapping 24-hour periods in the year. There has been some contention over which average is the more appropriate one on which to base compliance. Table 15 contains the maximum 24-hour SO_2 readings from both the running averages and the calendar day averages for comparison. The maximum calendar day readings are all lower than the maximum running average readings, and the differences range up to 37µg/m³ at East Haven 003 and New Haven 123.

3-Hour Averages - Table 16 presents the first and second high 3-hour concentrations recorded at each monitoring site. Measured SO_2 concentrations were far below the federal secondary 3-hour standard of 1300 µg/m³ at all DEP monitoring sites in 1986. Of the 16 sites that had a sufficient distribution and quantity of data in both 1985 and 1986, 8 had lower second high concentrations in

1986. These decreases ranged from 5 µg/m³ at Stamford 123 to 56 µg/m³ at Norwalk 013. Seven sites had higher second high concentrations in 1986. The increases ranged from 16 µg/m³ at Enfield 005 to 148 µg/m³ at New Haven 123.

10-High Days with Wind Data - Table 17 lists the ten highest 24-hour calendar day SO_2 averages and the dates of occurrence for each SO_2 site in Connecticut during 1986. The table also shows the average wind conditions that occurred on each of these dates. (The origin and use of these wind data are described in the discussion of Table 11 in the TSP section of this Air Quality Summary.)

Once again, as with TSP, many (i.e., 57.7%) of the highest SO_2 days occur with winds out of the southwest quadrant and most of these days have relatively persistent winds. This relationship is caused, at least in part, by SO_2 transport, but any transport is limited by the chemical instability of SO_2. In the atmosphere, SO_2 reacts with other gases to produce, among other things, sulfate particulates. Therefore, SO_2 is not likely to be transported very long distances. Previous studies conducted by the DEP have shown that, during periods of southwest winds, levels of SO_2 in Connecticut decrease with distance from the New York City metropolitan area. This relationship tends to support the transport hypothesis. On the other hand, these studies also revealed that certain meteorological parameters, most notably mixing height and wind speed, are more conducive to high SO_2 levels on days when there are southwesterly winds than on other days.

The data in Table 17 were used to make a tally, by date, of the frequency of occurrence of high SO_2 levels. Only those seventeen sites were used which had a sufficient distribution and quantity of data in 1986 to produce a valid annual average. If a given date recurred at five or more sites in this tally, the SO_2 levels and meteorological conditions were investigated further (there were 13 such days). A close look at these 13 days revealed two important points. First, 9 of the 13 days occurred during winter, and the rest occurred in late autumn. This can be attributed to more fuel being burned during the cold weather. Second, 9 of the 13 days had relatively persistent southwest winds for the calendar day, and one other day had such winds for the previous 24 hours.

In summary, high levels of SO_2 in Connecticut seem to be caused by a number of related factors. First, Connecticut experiences its highest SO_2 levels during the winter months, when there is an increased amount of fuel combustion. Second, the New York City metropolitan area, a large emission source, is located to the southwest of Connecticut and southwest winds occur relatively often in this region in comparison to other wind directions. Also, adverse meteorological conditions are often associated with southwest winds. The net effect is that during the winter months when a persistent southwesterly wind occurs, an air mass picks up increased amounts of SO_2 over the New York City metropolitan area and transports this SO_2 into Connecticut. Here, the SO_2 levels remain high because the relatively low mixing heights associated with the southwest flow and low winter temperatures will not allow much vertical mixing. The levels of transported SO_2 eventually decline with increasing distance from New York City, as the SO_2 is dispersed and as it slowly reacts to produce sulfate particulates. These sulfate particulates may fall to the ground in either a dry state (dry deposition) or in a wet state after combination with water droplets (wet deposition or "acid rain").

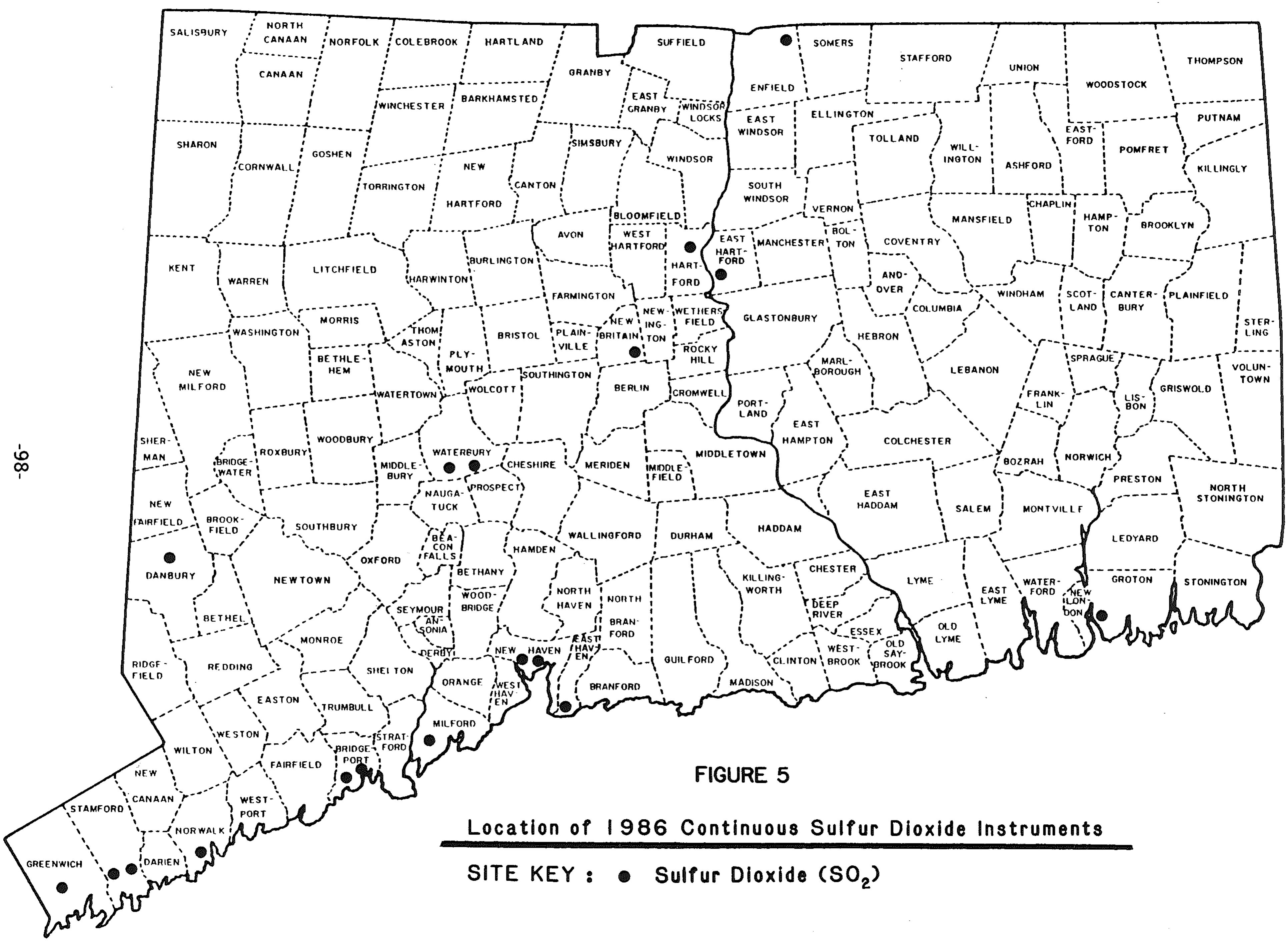


FIGURE 5

Location of 1986 Continuous Sulfur Dioxide Instruments

SITE KEY : ● Sulfur Dioxide (SO_2)

TABLE 12

1986 ANNUAL ARITHMETIC AVERAGES OF SULFUR DIOXIDE AT SITES WITH CONTINUOUS MONITORS

(PRIMARY STANDARD: 80 $\mu g/m^3$)

TOWN	SITE NAME	ANNUAL AVG* ($\mu g/m^3$)
Bridgeport-012	Edison School	32
Bridgeport-123	Hallett Street	30
Danbury-123	Western CT State College	20
East Hartford-005	Fire House - Engine Co. #5	22**
East Haven-003	Animal Shelter	22
Enfield-005	Department of Corrections	16
Greenwich-017	Greenwich Point Park	14
Groton-007	Fire Headquarters	21
Hartford-123	State Office Building	35
Milford-002	Devon Community Center	34
New Britain-011	Armory	26
New Haven-017	Lombard St. Fire House	35
New Haven-123	State Street	39
Norwalk-013	Ludlow School	23
Stamford-025	Recreation Center	29
Stamford-123	Health Department	28
Waterbury-008	Armory	34**
Waterbury-123	Bank Street	22

* The annual averages are expressed in terms of the arithmetic mean because the primary ambient air quality standard for SO_2 is defined as the annual arithmetic mean concentration. This differs from the trend analysis presented earlier in section I.B. of this Air Quality Summary which made use of the annual geometric mean.

** A valid annual average cannot be calculated because the number of observations is insufficient or is poorly distributed.

TABLE 13

1984-1986 SO2 ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

LOGNORMAL DISTRIBUTION

TOWN NAME	SITE	YEAR	SAMPLES	ARITHMETIC MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	STD DEVIATION	PREDICTED DAYS OVER 365 UG/M3
BRIDGEPORT	012	1984	333	32.9	32	34	33.836	1
BRIDGEPORT	012	1985	317	36.0	35	37	30.464	1
BRIDGEPORT	012	1986	353	32.6	32	33	25.153	
BRIDGEPORT	123	1984	358	31.8	31	32	26.948	
BRIDGEPORT	123	1985	358	31.5	31	32	26.101	
BRIDGEPORT	123	1986	360	29.8	30	30	23.094	
DANBURY	123	1984	358	17.5	17	18	18.635	
DANBURY	123	1985	292	20.0	19	21	17.747	
DANBURY	123	1986	360	20.1	20	20	14.590	
EAST HARTFORD	005	1984	309	27.4	26	28	24.298	
EAST HARTFORD	005	1985	306*	19.8	19	21	20.695	
EAST HARTFORD	005	1986	314*	21.8	21	23	17.838	
EAST HAVEN	003	1984	341	20.1	20	21	19.700	
EAST HAVEN	003	1985	332	24.8	24	26	23.377	
EAST HAVEN	003	1986	354	21.6	21	22	20.122	
ENFIELD	005	1984	349	13.9	14	14	16.871	
ENFIELD	005	1985	345	12.7	12	13	13.625	
ENFIELD	005	1986	335	15.9	16	16	13.614	
GREENWICH	017	1984	345	16.9	16	17	17.251	
GREENWICH	017	1985	357	14.4	14	15	12.452	
GREENWICH	017	1986	346	13.9	14	14	12.487	
GROTON	007	1984	334	20.6	20	21	16.210	
GROTON	007	1985	354	21.3	21	22	13.955	
GROTON	007	1986	343	21.5	21	22	13.408	

* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE ANNUAL AVERAGES IN TABLE 13 VARY SLIGHTLY FROM THOSE IN TABLE 12 DUE TO THE MANNER IN WHICH THEY WERE DERIVED. THE AVERAGES IN TABLE 12 ARE BASED ON THE AVAILABLE HOURLY READINGS, WHILE THOSE IN TABLE 13 ARE BASED ON VALID 24-HOUR AVERAGES. (AT LEAST 18 HOURLY READINGS ARE REQUIRED TO PRODUCE A VALID 24-HOUR AVERAGE.)

THE ARITHMETIC MEAN AND THE STANDARD DEVIATION HAVE UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 13, CONTINUED

1984-1986 SO2 ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

LOGNORMAL DISTRIBUTION

TOWN NAME	SITE	YEAR	SAMPLES	ARITHMETIC MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	STD DEVIATION	PREDICTED DAYS OVER 365 UG/M3
HARTFORD	123	1984	360	31.4	31	32	31.425	
HARTFORD	123	1985	361	22.8	23	23	22.298	
HARTFORD	123	1986	348	34.8	34	35	23.498	
MILFORD	002	1984	341	33.9	33	35	34.191	1
MILFORD	002	1985	349	29.3	29	30	27.498	
MILFORD	002	1986	362	33.8	33	34	32.389	
NEW BRITAIN	011	1984	227*	14.2	13	15	12.809	
NEW BRITAIN	011	1985	360	23.0	23	23	19.693	
NEW BRITAIN	011	1986	358	25.8	26	26	21.270	
NEW HAVEN	017	1984	330	24.6	24	25	22.161	
NEW HAVEN	017	1985	341	36.2	35	37	31.069	
NEW HAVEN	017	1986	352	35.5	35	36	30.593	
NEW HAVEN	123	1984	346	34.6	34	35	32.585	
NEW HAVEN	123	1985	357	44.3	44	45	36.297	
NEW HAVEN	123	1986	351	39.2	39	40	35.466	
NORWALK	013	1984	266*	17.1	16	18	14.621	1
NORWALK	013	1985	364	23.1	23	23	22.858	
NORWALK	013	1986	348	23.3	23	24	21.868	
PRESTON	002	1984	345	10.9	11	11	9.527	
PRESTON	002	1985	349	13.0	13	13	10.803	
PRESTON	002	1986	84*	19.2	17	22	13.297	
STAMFORD	025	1984	297*	23.0	22	24	16.563	
STAMFORD	025	1985	280*	28.5	27	30	21.965	
STAMFORD	025	1986	347	29.3	29	30	23.547	

*   SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE ANNUAL AVERAGES IN TABLE 13 VARY SLIGHTLY FROM THOSE IN TABLE 12 DUE TO THE MANNER IN WHICH THEY WERE DERIVED. THE AVERAGES IN TABLE 12 ARE BASED ON THE AVAILABLE HOURLY READINGS, WHILE THOSE IN TABLE 13 ARE BASED ON VALID 24-HOUR AVERAGES. (AT LEAST 18 HOURLY READINGS ARE REQUIRED TO PRODUCE A VALID 24-HOUR AVERAGE.)

THE ARITHMETIC MEAN AND THE STANDARD DEVIATION HAVE UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 13, CONTINUED

1984-1986 SO2 ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

TOWN NAME	SITE	YEAR	SAMPLES	ARITHMETIC MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	LOGNORMAL DISTRIBUTION STD DEVIATION	LOGNORMAL DISTRIBUTION PREDICTED DAYS OVER 365 UG/M3
STAMFORD	123	1984	343	31.9	31	32	21.563	
STAMFORD	123	1985	353	28.6	28	29	22.817	
STAMFORD	123	1986	355	27.5	27	28	20.827	
WATERBURY	007	1984	350	28.8	28	29	28.810	
WATERBURY	008	1986	125*	33.8	31	37	22.397	
WATERBURY	123	1984	334	22.7	22	23	20.813	
WATERBURY	123	1985	351	23.0	23	23	19.482	
WATERBURY	123	1986	359	22.0	22	22	18.366	

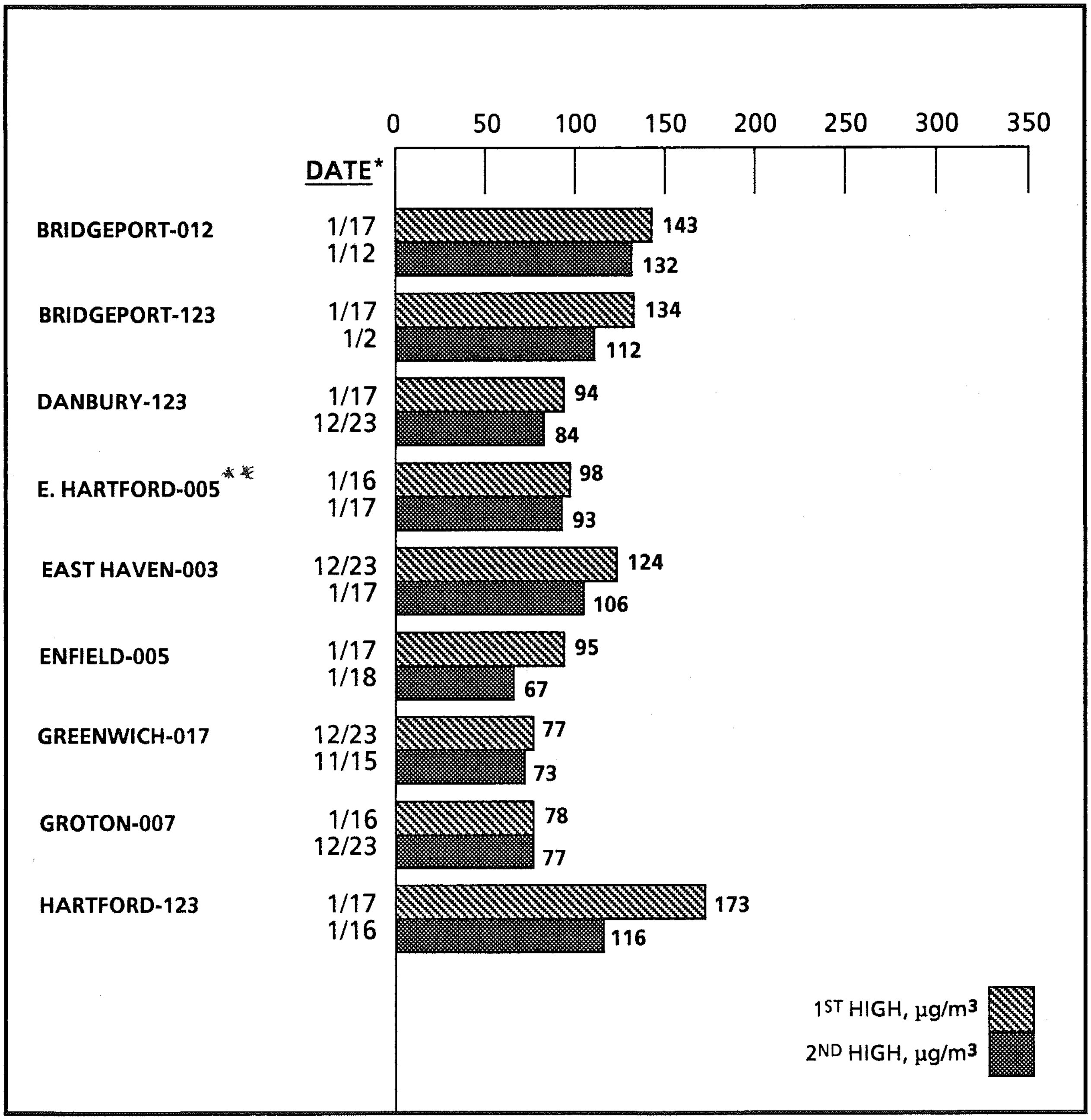
* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

N.B. THE ANNUAL AVERAGES IN TABLE 13 VARY SLIGHTLY FROM THOSE IN TABLE 12 DUE TO THE MANNER IN WHICH THEY WERE DERIVED. THE AVERAGES IN TABLE 12 ARE BASED ON THE AVAILABLE HOURLY READINGS, WHILE THOSE IN TABLE 13 ARE BASED ON VALID 24-HOUR AVERAGES. (AT LEAST 18 HOURLY READINGS ARE REQUIRED TO PRODUCE A VALID 24-HOUR AVERAGE.)

THE ARITHMETIC MEAN AND THE STANDARD DEVIATION HAVE UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 14

1986 MAXIMUM CALENDAR DAY AVERAGE SO2 CONCENTRATIONS

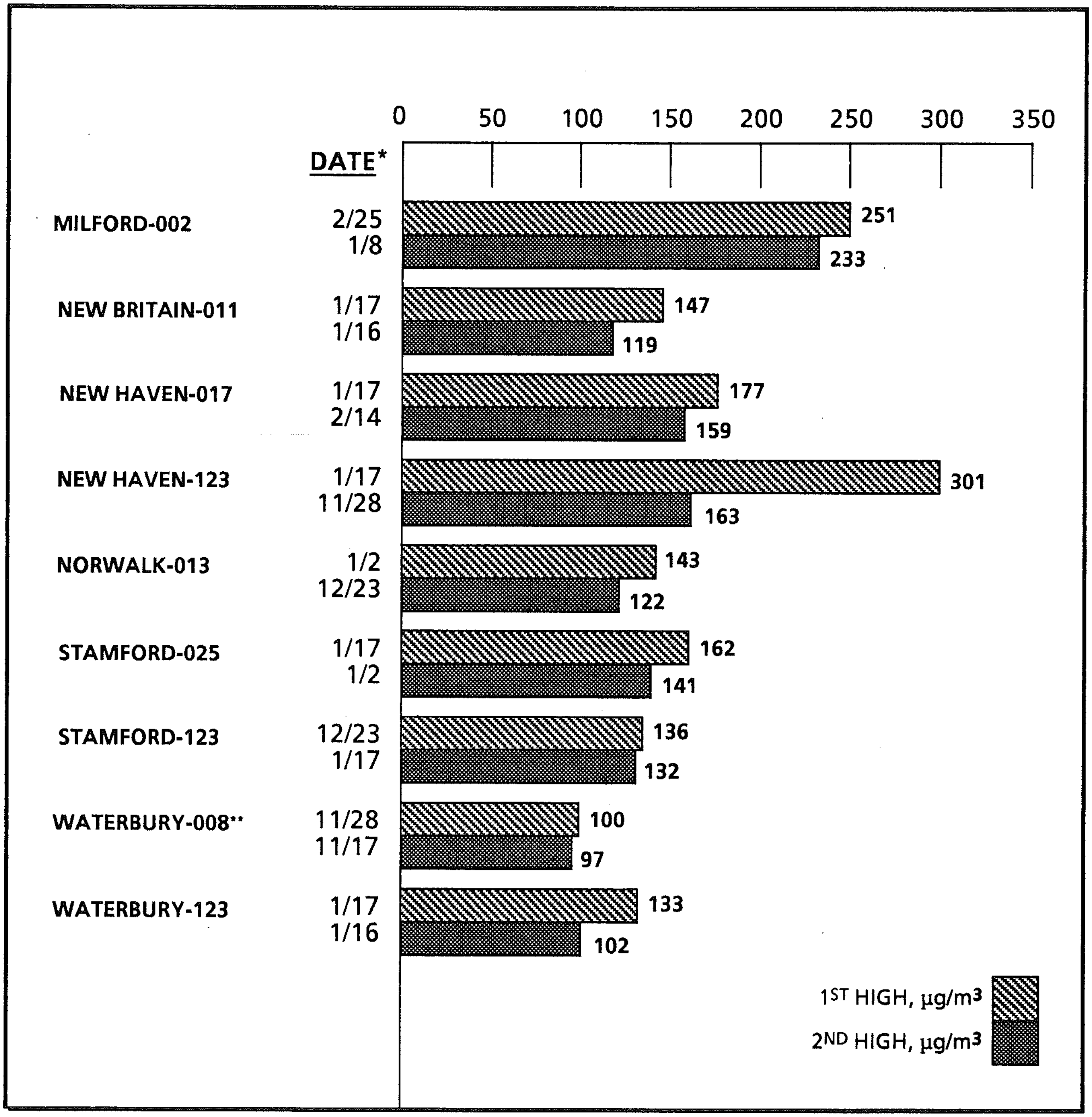


* Date is month/day of occurrence.
** Database for the site is deficient in number or distribution of observations.
N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

Primary standard = 365 µg/m^3.

TABLE 14, CONTINUED

1986 MAXIMUM CALENDAR DAY AVERAGE SO2 CONCENTRATIONS



* Date is month/day of occurrence.
** Database for the site is deficient in number or distribution of observations.
N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

Primary standard = 365 µg/m3.

TABLE 15

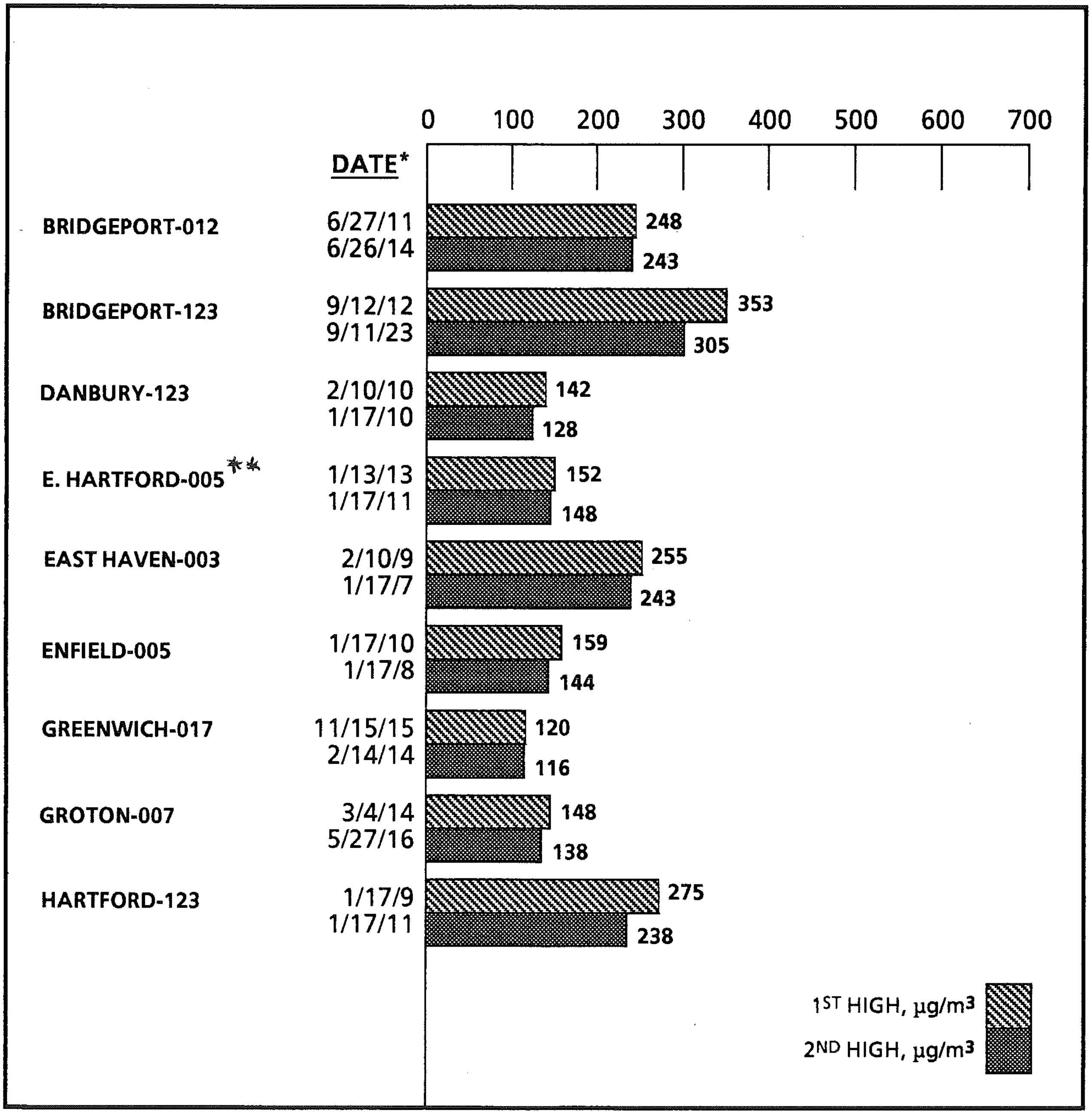
COMPARISONS OF FIRST AND SECOND HIGH CALENDAR DAY AND 24-HOUR RUNNING SO2 AVERAGES FOR 1986

SITE	FIRST HIGH AVERAGE		SECOND HIGH AVERAGE	
	RUNNING 24-HOUR	CALENDAR DAY	RUNNING 24-HOUR	CALENDAR DAY
Bridgeport-012	154	143	139	132
Bridgeport-123	155	134	142	112
Danbury-123	96	94	89	84
E. Hartford-005*	109	98	99	93
East Haven-003	161	124	143	106
Enfield-005	100	95	83	67
Greenwich-017	81	77	77	73
Groton-007	103	78	77	77
Hartford-123	179	173	150	116
Milford-002	270	251	241	233
New Britain-011	166	147	137	119
New Haven-017	178	177	163	159
New Haven-123	338	301	226	163
Norwalk-013	157	143	156	122
Stamford-025	164	162	143	141
Stamford-123	142	136	136	132
Waterbury-008*	122	100	117	97
Waterbury-123	148	133	124	102

N.B. The averages have units of $\mu g/m^3$.
* The number or distribution of observations at the site is inadequate for the calculation of a valid annual average.

TABLE 16

1986 MAXIMUM 3-HOUR RUNNING AVERAGE SO2 CONCENTRATIONS



* Date is month/day/ending hour of occurrence.

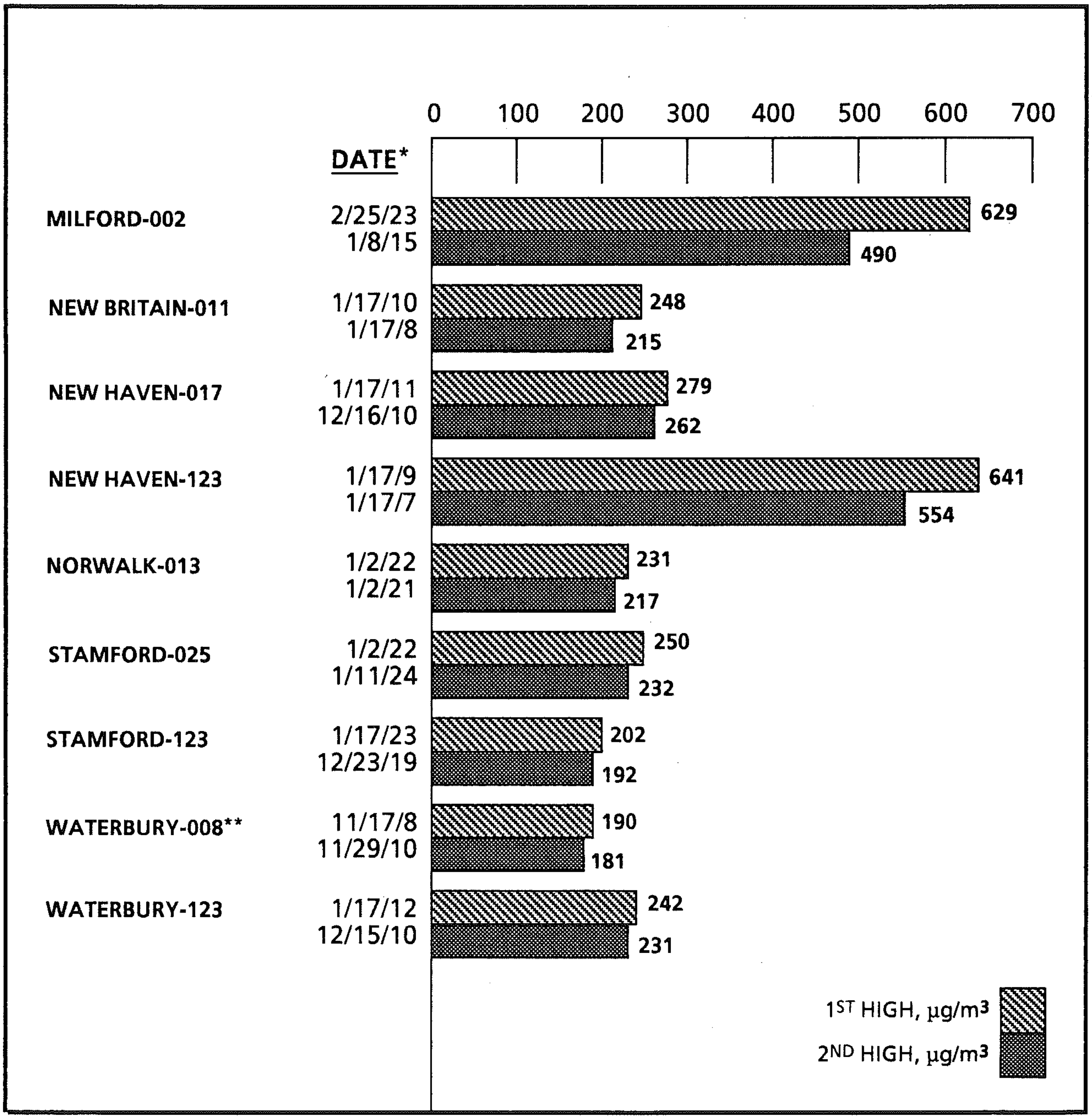
** Database for the site is deficient in number or distribution of observations.

N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

Secondary standard = 1300 µg/m^3.

TABLE 16, CONTINUED

1986 MAXIMUM 3-HOUR RUNNING AVERAGE SO2 CONCENTRATIONS



* Date is month/day/ending hour of occurrence.

** Database for the site is deficient in number or distribution of observations.

N.B. When a listed concentration occurs more than once at a site, the earliest date of occurrence is given first.

Secondary standard = 1300 $\mu g/m^3$.

TABLE 17

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BRIDGEPORT-012 (353)	SO2	143	132	125	118	106	106	98	93	93	93
	DATE	1/17/86	1/12/86	1/ 2/86	1/18/86	11/15/86	1/16/86	12/22/86	3/ 3/86	6/ 5/86	12/ 6/86
METEOROLOGICAL SITE	DIR (DEG)	170	200	220	210	220	220	270	210	210	230
NEWARK	VEL (MPH)	0.8	13.3	5.6	7.1	6.9	7.6	6.8	3.5	15.3	9.9
	SPD (MPH)	8.2	13.5	7.3	10.4	7.2	9.6	8.1	7.8	15.5	10.9
	RATIO	0.095	0.985	0.765	0.691	0.955	0.789	0.845	0.445	0.984	0.906
METEOROLOGICAL SITE	DIR (DEG)	190	200	210	180	190	170	210	220	170	210
BRADLEY	VEL (MPH)	4.3	11.5	7.3	6.4	7.3	1.0	5.1	2.2	4.9	6.0
	SPD (MPH)	4.5	11.8	8.1	6.6	7.5	2.6	5.5	3.9	7.8	6.6
	RATIO	0.974	0.978	0.901	0.971	0.976	0.384	0.935	0.556	0.632	0.915
METEOROLOGICAL SITE	DIR (DEG)	100	220	250	240	260	230	250	220	230	260
BRIDGEPORT	VEL (MPH)	0.2	11.4	4.7	5.6	7.7	2.9	7.5	5.5	7.9	11.5
	SPD (MPH)	5.6	11.8	4.9	6.3	7.9	4.7	7.8	6.0	8.1	11.8
	RATIO	0.028	0.968	0.963	0.888	0.970	0.614	0.962	0.913	0.986	0.978
METEOROLOGICAL SITE	DIR (DEG)	220	220	230	230	250	270	270	260	250	260
WORCESTER	VEL (MPH)	11.1	16.3	9.4	11.0	11.0	8.3	8.7	3.7	7.9	10.6
	SPD (MPH)	11.4	16.4	9.6	11.1	11.4	8.5	9.1	5.3	8.5	11.5
	RATIO	0.978	0.993	0.978	0.993	0.966	0.977	0.963	0.691	0.931	0.923
BRIDGEPORT-123 (360)	SO2	134	112	109	108	99	99	96	92	92	87
	DATE	1/17/86	1/ 2/86	12/23/86	1/18/86	9/12/86	11/15/86	1/16/86	11/29/86	12/15/86	1/ 9/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	230	210	230	220	220	280	240	230
NEWARK	VEL (MPH)	0.8	5.6	8.4	7.1	14.7	6.9	7.6	7.2	8.6	15.0
	SPD (MPH)	8.2	7.3	9.9	10.4	16.1	7.2	9.6	8.6	9.1	15.2
	RATIO	0.095	0.765	0.847	0.691	0.911	0.955	0.789	0.837	0.947	0.982
METEOROLOGICAL SITE	DIR (DEG)	190	210	240	180	230	190	170	310	260	210
BRADLEY	VEL (MPH)	4.3	7.3	4.6	6.4	11.7	7.3	1.0	5.6	8.4	10.4
	SPD (MPH)	4.5	8.1	8.1	6.6	13.7	7.5	2.6	6.2	11.2	10.6
	RATIO	0.974	0.901	0.571	0.971	0.860	0.976	0.384	0.900	0.752	0.975
METEOROLOGICAL SITE	DIR (DEG)	100	250	260	240	230	260	230	310	280	250
BRIDGEPORT	VEL (MPH)	0.2	4.7	7.9	5.6	7.9	7.7	2.9	5.4	6.7	16.5
	SPD (MPH)	5.6	4.9	8.6	6.3	8.9	7.9	4.7	6.2	7.5	16.7
	RATIO	0.028	0.963	0.912	0.888	0.888	0.970	0.614	0.872	0.899	0.988
METEOROLOGICAL SITE	DIR (DEG)	220	230	280	230	240	250	270	290	280	250
WORCESTER	VEL (MPH)	11.1	9.4	11.4	11.0	14.2	11.0	8.3	9.5	8.1	18.6
	SPD (MPH)	11.4	9.6	11.8	11.1	15.7	11.4	8.5	10.4	8.9	19.0
	RATIO	0.978	0.978	0.963	0.993	0.905	0.966	0.977	0.922	0.906	0.978
DANBURY-123 (360)	SO2	94	84	74	71	64	63	61	60	59	58
	DATE	1/17/86	12/23/86	1/16/86	1/ 2/86	1/18/86	1/ 9/86	11/15/86	12/15/86	2/14/86	11/17/86
METEOROLOGICAL SITE	DIR (DEG)	170	230	220	220	210	230	220	240	220	230
NEWARK	VEL (MPH)	0.8	8.4	7.6	5.6	7.1	15.0	6.9	8.6	9.7	5.0
	SPD (MPH)	8.2	9.9	9.6	7.3	10.4	15.2	7.2	9.1	11.1	5.0
	RATIO	0.095	0.847	0.789	0.765	0.691	0.982	0.955	0.947	0.880	0.990
METEOROLOGICAL SITE	DIR (DEG)	190	240	170	210	180	210	190	260	220	210
BRADLEY	VEL (MPH)	4.3	4.6	1.0	7.3	6.4	10.4	7.3	8.4	7.4	5.6
	SPD (MPH)	4.5	8.1	2.6	8.1	6.6	10.6	7.5	11.2	9.1	6.6
	RATIO	0.974	0.571	0.384	0.901	0.971	0.975	0.976	0.752	0.815	0.853

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	100	260	230	250	240	250	260	280	250	250
BRIDGEPORT	VEL (MPH)	0.2	7.9	2.9	4.7	5.6	16.5	7.7	6.7	9.1	6.3
	SPD (MPH)	5.6	8.6	4.7	4.9	6.3	16.7	7.9	7.5	9.6	6.5
	RATIO	0.028	0.912	0.614	0.963	0.888	0.988	0.970	0.899	0.948	0.974
METEOROLOGICAL SITE	DIR (DEG)	220	280	270	230	230	250	250	280	230	260
WORCESTER	VEL (MPH)	11.1	11.4	8.3	9.4	11.0	18.6	11.0	8.1	10.1	8.9
	SPD (MPH)	11.4	11.8	8.5	9.6	11.1	19.0	11.4	8.9	10.6	9.3
	RATIO	0.978	0.963	0.977	0.978	0.993	0.978	0.966	0.906	0.950	0.950
EAST HARTFORD-005 (314)	SO2	98	93	78	73	71	70	70	69	69	66
	DATE	1/16/86	1/17/86	1/18/86	11/16/86	11/17/86	2/ 9/86	2/14/86	12/23/86	3/ 4/86	1/ 2/86
METEOROLOGICAL SITE	DIR (DEG)	220	170	210	260	230	360	220	230	180	220
NEWARK	VEL (MPH)	7.6	0.8	7.1	5.6	5.0	2.6	9.7	8.4	4.1	5.6
	SPD (MPH)	9.6	8.2	10.4	7.3	5.0	7.8	11.1	9.9	6.6	7.3
	RATIO	0.789	0.095	0.691	0.758	0.990	0.334	0.880	0.847	0.614	0.765
METEOROLOGICAL SITE	DIR (DEG)	170	190	180	340	210	300	220	240	220	210
BRADLEY	VEL (MPH)	1.0	4.3	6.4	1.2	5.6	4.1	7.4	4.6	4.0	7.3
	SPD (MPH)	2.6	4.5	6.6	4.9	6.6	5.9	9.1	8.1	6.2	8.1
	RATIO	0.384	0.974	0.971	0.254	0.853	0.700	0.815	0.571	0.646	0.901
METEOROLOGICAL SITE	DIR (DEG)	230	100	240	300	250	280	250	260	90	250
BRIDGEPORT	VEL (MPH)	2.9	0.2	5.6	2.6	6.3	5.7	9.1	7.9	3.2	4.7
	SPD (MPH)	4.7	5.6	6.3	3.6	6.5	6.8	9.6	8.6	3.6	4.9
	RATIO	0.614	0.028	0.888	0.732	0.974	0.848	0.948	0.912	0.904	0.963
METEOROLOGICAL SITE	DIR (DEG)	270	220	230	300	260	280	230	280	220	230
WORCESTER	VEL (MPH)	8.3	11.1	11.0	5.3	8.9	7.8	10.1	11.4	4.4	9.4
	SPD (MPH)	8.5	11.4	11.1	6.2	9.3	8.2	10.6	11.8	5.5	9.6
	RATIO	0.977	0.978	0.993	0.854	0.950	0.955	0.950	0.963	0.801	0.978
EAST HAVEN-003 (354)	SO2	124	106	105	96	95	93	88	84	81	80
	DATE	12/23/86	1/17/86	2/10/86	1/16/86	12/15/86	12/16/86	11/28/86	12/24/86	2/14/86	2/ 9/86
METEOROLOGICAL SITE	DIR (DEG)	230	170	10	220	240	210	240	50	220	360
NEWARK	VEL (MPH)	8.4	0.8	3.5	7.6	8.6	5.5	4.7	10.9	9.7	2.6
	SPD (MPH)	9.9	8.2	8.5	9.6	9.1	6.6	6.2	11.6	11.1	7.8
	RATIO	0.847	0.095	0.410	0.789	0.947	0.825	0.760	0.936	0.880	0.334
METEOROLOGICAL SITE	DIR (DEG)	240	190	290	170	260	210	190	50	220	300
BRADLEY	VEL (MPH)	4.6	4.3	4.8	1.0	8.4	1.8	4.7	4.2	7.4	4.1
	SPD (MPH)	8.1	4.5	7.0	2.6	11.2	3.4	5.3	6.8	9.1	5.9
	RATIO	0.571	0.974	0.687	0.384	0.752	0.522	0.882	0.626	0.815	0.700
METEOROLOGICAL SITE	DIR (DEG)	260	100	250	230	280	260	260	90	250	280
BRIDGEPORT	VEL (MPH)	7.9	0.2	4.4	2.9	6.7	0.6	3.8	12.2	9.1	5.7
	SPD (MPH)	8.6	5.6	5.8	4.7	7.5	3.3	4.6	13.7	9.6	6.8
	RATIO	0.912	0.028	0.769	0.614	0.899	0.184	0.833	0.891	0.948	0.848
METEOROLOGICAL SITE	DIR (DEG)	280	220	270	270	280	160	260	80	230	280
WORCESTER	VEL (MPH)	11.4	11.1	7.2	8.3	8.1	1.2	9.2	5.3	10.1	7.8
	SPD (MPH)	11.8	11.4	7.5	8.5	8.9	3.4	9.5	7.9	10.6	8.2
	RATIO	0.963	0.978	0.965	0.977	0.906	0.346	0.969	0.675	0.950	0.955

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)		RANK	1	2	3	4	5	6	7	8	9	10
ENFIELD-005 (335)		SO2	95	67	64	62	60	60	57	56	55	54
		DATE	1/17/86	1/18/86	12/23/86	2/14/86	11/16/86	3/ 4/86	1/ 9/86	1/16/86	11/15/86	2/ 5/86
	METEOROLOGICAL SITE	DIR (DEG)	170	210	230	220	260	180	230	220	220	280
	NEWARK	VEL (MPH)	0.8	7.1	8.4	9.7	5.6	4.1	15.0	7.6	6.9	4.5
		SPD (MPH)	8.2	10.4	9.9	11.1	7.3	6.6	15.2	9.6	7.2	11.2
		RATIO	0.095	0.691	0.847	0.880	0.758	0.614	0.982	0.789	0.955	0.402
	METEOROLOGICAL SITE	DIR (DEG)	190	180	240	220	340	220	210	170	190	10
	BRADLEY	VEL (MPH)	4.3	6.4	4.6	7.4	1.2	4.0	10.4	1.0	7.3	4.1
		SPD (MPH)	4.5	6.6	8.1	9.1	4.9	6.2	10.6	2.6	7.5	5.3
		RATIO	0.974	0.971	0.571	0.815	0.254	0.646	0.975	0.384	0.976	0.774
	METEOROLOGICAL SITE	DIR (DEG)	100	240	260	250	300	90	250	230	260	270
	BRIDGEPORT	VEL (MPH)	0.2	5.6	7.9	9.1	2.6	3.2	16.5	2.9	7.7	5.8
		SPD (MPH)	5.6	6.3	8.6	9.6	3.6	3.6	16.7	4.7	7.9	6.3
		RATIO	0.028	0.888	0.912	0.948	0.732	0.904	0.988	0.614	0.970	0.913
	METEOROLOGICAL SITE	DIR (DEG)	220	230	280	230	300	220	250	270	250	320
	WORCESTER	VEL (MPH)	11.1	11.0	11.4	10.1	5.3	4.4	18.6	8.3	11.0	5.6
		SPD (MPH)	11.4	11.1	11.8	10.6	6.2	5.5	19.0	8.5	11.4	7.3
		RATIO	0.978	0.993	0.963	0.950	0.854	0.801	0.978	0.977	0.966	0.768
GREENWICH-017 (346)		SO2	77	73	72	63	63	61	51	49	49	44
		DATE	12/23/86	11/15/86	1/ 2/86	1/ 9/86	1/16/86	1/17/86	1/29/86	2/14/86	12/17/86	11/16/86
	METEOROLOGICAL SITE	DIR (DEG)	230	220	220	230	220	170	320	220	70	260
	NEWARK	VEL (MPH)	8.4	6.9	5.6	15.0	7.6	0.8	2.4	9.7	4.7	5.6
		SPD (MPH)	9.9	7.2	7.3	15.2	9.6	8.2	10.2	11.1	7.3	7.3
		RATIO	0.847	0.955	0.765	0.982	0.789	0.095	0.235	0.880	0.644	0.758
	METEOROLOGICAL SITE	DIR (DEG)	240	190	210	210	170	190	190	220	10	340
	BRADLEY	VEL (MPH)	4.6	7.3	7.3	10.4	1.0	4.3	2.9	7.4	2.9	1.2
		SPD (MPH)	8.1	7.5	8.1	10.6	2.6	4.5	6.2	9.1	3.0	4.9
		RATIO	0.571	0.976	0.901	0.975	0.384	0.974	0.477	0.815	0.970	0.254
	METEOROLOGICAL SITE	DIR (DEG)	260	260	250	250	230	100	290	250	90	300
	BRIDGEPORT	VEL (MPH)	7.9	7.7	4.7	16.5	2.9	0.2	3.6	9.1	7.5	2.6
		SPD (MPH)	8.6	7.9	4.9	16.7	4.7	5.6	7.6	9.6	8.8	3.6
		RATIO	0.912	0.970	0.963	0.988	0.614	0.028	0.468	0.948	0.857	0.732
	METEOROLOGICAL SITE	DIR (DEG)	280	250	230	250	270	220	250	230	70	300
	WORCESTER	VEL (MPH)	11.4	11.0	9.4	18.6	8.3	11.1	6.6	10.1	3.5	5.3
		SPD (MPH)	11.8	11.4	9.6	19.0	8.5	11.4	7.3	10.6	3.7	6.2
		RATIO	0.963	0.966	0.978	0.978	0.977	0.978	0.904	0.950	0.942	0.854
GROTON-007 (343)		SO2	78	77	63	63	62	61	61	59	59	58
		DATE	1/16/86	12/23/86	1/18/86	1/ 2/86	1/10/86	1/ 9/86	12/15/86	1/17/86	11/28/86	3/ 4/86
	METEOROLOGICAL SITE	DIR (DEG)	220	230	210	220	260	230	240	170	240	180
	NEWARK	VEL (MPH)	7.6	8.4	7.1	5.6	9.0	15.0	8.6	0.8	4.7	4.1
		SPD (MPH)	9.6	9.9	10.4	7.3	9.9	15.2	9.1	8.2	6.2	6.6
		RATIO	0.789	0.847	0.691	0.765	0.911	0.982	0.947	0.095	0.760	0.614
	METEOROLOGICAL SITE	DIR (DEG)	170	240	180	210	250	210	260	190	190	220
	BRADLEY	VEL (MPH)	1.0	4.6	6.4	7.3	6.4	10.4	8.4	4.3	4.7	4.0
		SPD (MPH)	2.6	8.1	6.6	8.1	8.8	10.6	11.2	4.5	5.3	6.2
		RATIO	0.384	0.571	0.971	0.901	0.734	0.975	0.752	0.974	0.882	0.646

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	230	260	240	250	260	250	280	100	260	90
BRIDGEPORT	VEL (MPH)	2.9	7.9	5.6	4.7	11.7	16.5	6.7	0.2	3.8	3.2
	SPD (MPH)	4.7	8.6	6.3	4.9	12.4	16.7	7.5	5.6	4.6	3.6
	RATIO	0.614	0.912	0.888	0.963	0.944	0.988	0.899	0.028	0.833	0.904
METEOROLOGICAL SITE	DIR (DEG)	270	280	230	230	260	250	280	220	260	220
WORCESTER	VEL (MPH)	8.3	11.4	11.0	9.4	12.9	18.6	8.1	11.1	9.2	4.4
	SPD (MPH)	8.5	11.8	11.1	9.6	13.5	19.0	8.9	11.4	9.5	5.5
	RATIO	0.977	0.963	0.993	0.978	0.956	0.978	0.906	0.978	0.969	0.801
HARTFORD-123 (348)	SO2	173	116	104	104	102	93	92	92	92	90
	DATE	1/17/86	1/16/86	12/23/86	1/18/86	3/ 4/86	12/22/86	11/26/86	1/ 2/86	11/16/86	12/29/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	230	210	180	270	180	220	260	160
NEWARK	VEL (MPH)	0.8	7.6	8.4	7.1	4.1	6.8	5.7	5.6	5.6	2.3
	SPD (MPH)	8.2	9.6	9.9	10.4	6.6	8.1	7.8	7.3	7.3	4.2
	RATIO	0.095	0.789	0.847	0.691	0.614	0.845	0.731	0.765	0.758	0.546
METEOROLOGICAL SITE	DIR (DEG)	190	170	240	180	220	210	190	210	340	180
BRADLEY	VEL (MPH)	4.3	1.0	4.6	6.4	4.0	5.1	1.2	7.3	1.2	2.2
	SPD (MPH)	4.5	2.6	8.1	6.6	6.2	5.5	5.3	8.1	4.9	2.7
	RATIO	0.974	0.384	0.571	0.971	0.646	0.935	0.222	0.901	0.254	0.798
METEOROLOGICAL SITE	DIR (DEG)	100	230	260	240	90	250	200	250	300	220
BRIDGEPORT	VEL (MPH)	0.2	2.9	7.9	5.6	3.2	7.5	4.7	4.7	2.6	1.4
	SPD (MPH)	5.6	4.7	8.6	6.3	3.6	7.8	9.6	4.9	3.6	3.9
	RATIO	0.028	0.614	0.912	0.888	0.904	0.962	0.488	0.963	0.732	0.356
METEOROLOGICAL SITE	DIR (DEG)	220	270	280	230	220	270	210	230	300	310
WORCESTER	VEL (MPH)	11.1	8.3	11.4	11.0	4.4	8.7	9.2	9.4	5.3	2.2
	SPD (MPH)	11.4	8.5	11.8	11.1	5.5	9.1	10.5	9.6	6.2	4.6
	RATIO	0.978	0.977	0.963	0.993	0.801	0.963	0.876	0.978	0.854	0.468
MILFORD-002 (362)	SO2	251	233	175	168	161	143	133	132	128	113
	DATE	2/25/86	1/ 8/86	12/13/86	9/16/86	11/13/86	3/24/86	3/ 8/86	12/23/86	1/ 9/86	11/15/86
METEOROLOGICAL SITE	DIR (DEG)	340	310	320	310	310	320	300	230	230	220
NEWARK	VEL (MPH)	18.8	14.5	15.9	12.7	13.5	10.0	18.3	8.4	15.0	6.9
	SPD (MPH)	20.0	14.8	16.1	16.8	14.8	13.1	19.5	9.9	15.2	7.2
	RATIO	0.939	0.979	0.990	0.753	0.909	0.767	0.935	0.847	0.982	0.955
METEOROLOGICAL SITE	DIR (DEG)	330	320	310	310	320	300	310	240	210	190
BRADLEY	VEL (MPH)	11.7	6.3	13.1	12.1	11.6	9.1	12.7	4.6	10.4	7.3
	SPD (MPH)	12.2	8.1	13.4	13.7	12.1	11.6	12.8	8.1	10.6	7.5
	RATIO	0.960	0.788	0.981	0.889	0.964	0.785	0.995	0.571	0.975	0.976
METEOROLOGICAL SITE	DIR (DEG)	330	320	340	350	330	320	300	260	250	260
BRIDGEPORT	VEL (MPH)	16.2	11.4	10.6	12.2	11.9	10.4	11.7	7.9	16.5	7.7
	SPD (MPH)	16.4	11.8	10.9	12.4	12.1	11.4	12.4	8.6	16.7	7.9
	RATIO	0.991	0.968	0.969	0.986	0.989	0.918	0.948	0.912	0.988	0.970
METEOROLOGICAL SITE	DIR (DEG)	320	310	320	330	310	280	290	280	250	250
WORCESTER	VEL (MPH)	11.2	14.8	11.4	12.9	14.4	13.2	14.9	11.4	18.6	11.0
	SPD (MPH)	11.6	16.1	11.8	16.2	15.5	14.7	15.5	11.8	19.0	11.4
	RATIO	0.962	0.917	0.966	0.794	0.929	0.900	0.961	0.963	0.978	0.966

5

3

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
NEW BRITAIN-011 (358)	SO2	147	119	98	92	92	85	82	80	79	79
	DATE	1/17/86	1/16/86	1/ 2/86	12/23/86	1/18/86	11/16/86	12/29/86	3/ 4/86	2/14/86	11/15/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	220	230	210	260	160	180	220	220
NEWARK	VEL (MPH)	0.8	7.6	5.6	8.4	7.1	5.6	2.3	4.1	9.7	6.9
	SPD (MPH)	8.2	9.6	7.3	9.9	10.4	7.3	4.2	6.6	11.1	7.2
	RATIO	0.095	0.789	0.765	0.847	0.691	0.758	0.546	0.614	0.880	0.955
METEOROLOGICAL SITE	DIR (DEG)	190	170	210	240	180	340	180	220	220	190
BRADLEY	VEL (MPH)	4.3	1.0	7.3	4.6	6.4	1.2	2.2	4.0	7.4	7.3
	SPD (MPH)	4.5	2.6	8.1	8.1	6.6	4.9	2.7	6.2	9.1	7.5
	RATIO	0.974	0.384	0.901	0.571	0.971	0.254	0.798	0.646	0.815	0.976
METEOROLOGICAL SITE	DIR (DEG)	100	230	250	260	240	300	220	90	250	260
BRIDGEPORT	VEL (MPH)	0.2	2.9	4.7	7.9	5.6	2.6	1.4	3.2	9.1	7.7
	SPD (MPH)	5.6	4.7	4.9	8.6	6.3	3.6	3.9	3.6	9.6	7.9
	RATIO	0.028	0.614	0.963	0.912	0.888	0.732	0.356	0.904	0.948	0.970
METEOROLOGICAL SITE	DIR (DEG)	220	270	230	280	230	300	310	220	230	250
WORCESTER	VEL (MPH)	11.1	8.3	9.4	11.4	11.0	5.3	2.2	4.4	10.1	11.0
	SPD (MPH)	11.4	8.5	9.6	11.8	11.1	6.2	4.6	5.5	10.6	11.4
	RATIO	0.978	0.977	0.978	0.963	0.993	0.854	0.468	0.801	0.950	0.966
NEW HAVEN-017 (352)	SO2	177	159	151	137	136	135	134	127	124	122
	DATE	1/17/86	2/14/86	12/16/86	1/ 2/86	12/15/86	12/ 6/86	1/ 9/86	1/18/86	12/22/86	12/23/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	210	220	240	230	230	210	270	230
NEWARK	VEL (MPH)	0.8	9.7	5.5	5.6	8.6	9.9	15.0	7.1	6.8	8.4
	SPD (MPH)	8.2	11.1	6.6	7.3	9.1	10.9	15.2	10.4	8.1	9.9
	RATIO	0.095	0.880	0.825	0.765	0.947	0.906	0.982	0.691	0.845	0.847
METEOROLOGICAL SITE	DIR (DEG)	190	220	210	210	260	210	210	180	210	240
BRADLEY	VEL (MPH)	4.3	7.4	1.8	7.3	8.4	6.0	10.4	6.4	5.1	4.6
	SPD (MPH)	4.5	9.1	3.4	8.1	11.2	6.6	10.6	6.6	5.5	8.1
	RATIO	0.974	0.815	0.522	0.901	0.752	0.915	0.975	0.971	0.935	0.571
METEOROLOGICAL SITE	DIR (DEG)	100	250	260	250	280	260	250	240	250	260
BRIDGEPORT	VEL (MPH)	0.2	9.1	0.6	4.7	6.7	11.5	16.5	5.6	7.5	7.9
	SPD (MPH)	5.6	9.6	3.3	4.9	7.5	11.8	16.7	6.3	7.8	8.6
	RATIO	0.028	0.948	0.184	0.963	0.899	0.978	0.988	0.888	0.962	0.912
METEOROLOGICAL SITE	DIR (DEG)	220	230	160	230	280	260	250	230	270	280
WORCESTER	VEL (MPH)	11.1	10.1	1.2	9.4	8.1	10.6	18.6	11.0	8.7	11.4
	SPD (MPH)	11.4	10.6	3.4	9.6	8.9	11.5	19.0	11.1	9.1	11.8
	RATIO	0.978	0.950	0.346	0.978	0.906	0.923	0.978	0.993	0.963	0.963
NEW HAVEN-123 (351)	SO2	301	163	154	151	151	144	142	139	136	134
	DATE	1/17/86	11/28/86	2/14/86	1/16/86	1/ 2/86	1/ 3/86	1/13/86	2/10/86	1/ 9/86	11/26/86
METEOROLOGICAL SITE	DIR (DEG)	170	240	220	220	220	290	320	10	230	180
NEWARK	VEL (MPH)	0.8	4.7	9.7	7.6	5.6	4.5	12.8	3.5	15.0	5.7
	SPD (MPH)	8.2	6.2	11.1	9.6	7.3	7.8	15.8	8.5	15.2	7.8
	RATIO	0.095	0.760	0.880	0.789	0.765	0.580	0.811	0.410	0.982	0.731
METEOROLOGICAL SITE	DIR (DEG)	190	190	220	170	210	10	310	290	210	190
BRADLEY	VEL (MPH)	4.3	4.7	7.4	1.0	7.3	3.7	5.6	4.8	10.4	1.2
	SPD (MPH)	4.5	5.3	9.1	2.6	8.1	5.0	7.5	7.0	10.6	5.3
	RATIO	0.974	0.882	0.815	0.384	0.901	0.727	0.746	0.687	0.975	0.222

6

7

5

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	100	260	250	230	250	270	320	250	250	200
BRIDGEPORT	VEL (MPH)	0.2	3.8	9.1	2.9	4.7	3.1	8.8	4.4	16.5	4.7
	SPD (MPH)	5.6	4.6	9.6	4.7	4.9	7.2	11.4	5.8	16.7	9.6
	RATIO	0.028	0.833	0.948	0.614	0.963	0.429	0.771	0.769	0.988	0.488
METEOROLOGICAL SITE	DIR (DEG)	220	260	230	270	230	290	290	270	250	210
WORCESTER	VEL (MPH)	11.1	9.2	10.1	8.3	9.4	5.2	9.4	7.2	18.6	9.2
	SPD (MPH)	11.4	9.5	10.6	8.5	9.6	7.6	10.4	7.5	19.0	10.5
	RATIO	0.978	0.969	0.950	0.977	0.978	0.680	0.909	0.965	0.978	0.876
NORWALK-013 (348)	SO2	143	122	104	98	97	93	85	85	84	80
	DATE	1/ 2/86	12/23/86	12/16/86	12/22/86	1/16/86	12/17/86	12/15/86	1/ 9/86	2/10/86	1/ 3/86
METEOROLOGICAL SITE	DIR (DEG)	220	230	210	270	220	70	240	230	10	290
NEWARK	VEL (MPH)	5.6	8.4	5.5	6.8	7.6	4.7	8.6	15.0	3.5	4.5
	SPD (MPH)	7.3	9.9	6.6	8.1	9.6	7.3	9.1	15.2	8.5	7.8
	RATIO	0.765	0.847	0.825	0.845	0.789	0.644	0.947	0.982	0.410	0.580
METEOROLOGICAL SITE	DIR (DEG)	210	240	210	210	170	10	260	210	290	10
BRADLEY	VEL (MPH)	7.3	4.6	1.8	5.1	1.0	2.9	8.4	10.4	4.8	3.7
	SPD (MPH)	8.1	8.1	3.4	5.5	2.6	3.0	11.2	10.6	7.0	5.0
	RATIO	0.901	0.571	0.522	0.935	0.384	0.970	0.752	0.975	0.687	0.727
METEOROLOGICAL SITE	DIR (DEG)	250	260	260	250	230	90	280	250	250	270
BRIDGEPORT	VEL (MPH)	4.7	7.9	0.6	7.5	2.9	7.5	6.7	16.5	4.4	3.1
	SPD (MPH)	4.9	8.6	3.3	7.8	4.7	8.8	7.5	16.7	5.8	7.2
	RATIO	0.963	0.912	0.184	0.962	0.614	0.857	0.899	0.988	0.769	0.429
METEOROLOGICAL SITE	DIR (DEG)	230	280	160	270	270	70	280	250	270	290
WORCESTER	VEL (MPH)	9.4	11.4	1.2	8.7	8.3	3.5	8.1	18.6	7.2	5.2
	SPD (MPH)	9.6	11.8	3.4	9.1	8.5	3.7	8.9	19.0	7.5	7.6
	RATIO	0.978	0.963	0.346	0.963	0.977	0.942	0.906	0.978	0.965	0.680
STAMFORD-025 (347)	SO2	162	141	127	107	101	101	101	97	91	86
	DATE	1/17/86	1/ 2/86	12/23/86	1/16/86	11/15/86	1/18/86	12/16/86	12/22/86	12/17/86	12/ 7/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	230	220	220	210	210	270	70	210
NEWARK	VEL (MPH)	0.8	5.6	8.4	7.6	6.9	7.1	5.5	6.8	4.7	6.0
	SPD (MPH)	8.2	7.3	9.9	9.6	7.2	10.4	6.6	8.1	7.3	7.0
	RATIO	0.095	0.765	0.847	0.789	0.955	0.691	0.825	0.845	0.644	0.856
METEOROLOGICAL SITE	DIR (DEG)	190	210	240	170	190	180	210	210	10	210
BRADLEY	VEL (MPH)	4.3	7.3	4.6	1.0	7.3	6.4	1.8	5.1	2.9	6.5
	SPD (MPH)	4.5	8.1	8.1	2.6	7.5	6.6	3.4	5.5	3.0	8.5
	RATIO	0.974	0.901	0.571	0.384	0.976	0.971	0.522	0.935	0.970	0.763
METEOROLOGICAL SITE	DIR (DEG)	100	250	260	230	260	240	260	250	90	230
BRIDGEPORT	VEL (MPH)	0.2	4.7	7.9	2.9	7.7	5.6	0.6	7.5	7.5	6.3
	SPD (MPH)	5.6	4.9	8.6	4.7	7.9	6.3	3.3	7.8	8.8	8.3
	RATIO	0.028	0.963	0.912	0.614	0.970	0.888	0.184	0.962	0.857	0.755
METEOROLOGICAL SITE	DIR (DEG)	220	230	280	270	250	230	160	270	70	240
WORCESTER	VEL (MPH)	11.1	9.4	11.4	8.3	11.0	11.0	1.2	8.7	3.5	8.1
	SPD (MPH)	11.4	9.6	11.8	8.5	11.4	11.1	3.4	9.1	3.7	9.9
	RATIO	0.978	0.978	0.963	0.977	0.966	0.993	0.346	0.963	0.942	0.819

4

6

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
STAMFORD-123 (355)	SO2	136	132	109	99	89	88	88	88	87	87
	DATE	12/23/86	1/17/86	1/ 2/86	11/15/86	12/17/86	12/14/86	12/16/86	1/16/86	1/18/86	12/30/86
METEOROLOGICAL SITE	DIR (DEG)	230	170	220	220	70	230	210	220	210	10
NEWARK	VEL (MPH)	8.4	0.8	5.6	6.9	4.7	10.1	5.5	7.6	7.1	9.1
	SPD (MPH)	9.9	8.2	7.3	7.2	7.3	11.1	6.6	9.6	10.4	9.8
	RATIO	0.847	0.095	0.765	0.955	0.644	0.912	0.825	0.789	0.691	0.934
METEOROLOGICAL SITE	DIR (DEG)	240	190	210	190	10	210	210	170	180	360
BRADLEY	VEL (MPH)	4.6	4.3	7.3	7.3	2.9	10.0	1.8	1.0	6.4	8.3
	SPD (MPH)	8.1	4.5	8.1	7.5	3.0	10.2	3.4	2.6	6.6	8.6
	RATIO	0.571	0.974	0.901	0.976	0.970	0.975	0.522	0.384	0.971	0.959
METEOROLOGICAL SITE	DIR (DEG)	260	100	250	260	90	260	260	230	240	40
BRIDGEPORT	VEL (MPH)	7.9	0.2	4.7	7.7	7.5	11.9	0.6	2.9	5.6	8.1
	SPD (MPH)	8.6	5.6	4.9	7.9	8.8	12.5	3.3	4.7	6.3	9.3
	RATIO	0.912	0.028	0.963	0.970	0.857	0.951	0.184	0.614	0.888	0.862
METEOROLOGICAL SITE	DIR (DEG)	280	220	230	250	70	250	160	270	230	40
WORCESTER	VEL (MPH)	11.4	11.1	9.4	11.0	3.5	13.2	1.2	8.3	11.0	5.3
	SPD (MPH)	11.8	11.4	9.6	11.4	3.7	13.8	3.4	8.5	11.1	7.2
	RATIO	0.963	0.978	0.978	0.966	0.942	0.957	0.346	0.977	0.993	0.743
WATERBURY-008 (125)	SO2	100	97	95	87	84	82	81	79	75	75
	DATE	11/28/86	11/17/86	12/23/86	11/29/86	11/15/86	12/29/86	12/16/86	12/ 7/86	12/24/86	12/22/86
METEOROLOGICAL SITE	DIR (DEG)	240	230	230	280	220	160	210	210	50	270
NEWARK	VEL (MPH)	4.7	5.0	8.4	7.2	6.9	2.3	5.5	6.0	10.9	6.8
	SPD (MPH)	6.2	5.0	9.9	8.6	7.2	4.2	6.6	7.0	11.6	8.1
	RATIO	0.760	0.990	0.847	0.837	0.955	0.546	0.825	0.856	0.936	0.845
METEOROLOGICAL SITE	DIR (DEG)	190	210	240	310	190	180	210	210	50	210
BRADLEY	VEL (MPH)	4.7	5.6	4.6	5.6	7.3	2.2	1.8	6.5	4.2	5.1
	SPD (MPH)	5.3	6.6	8.1	6.2	7.5	2.7	3.4	8.5	6.8	5.5
	RATIO	0.882	0.853	0.571	0.900	0.976	0.798	0.522	0.763	0.626	0.935
METEOROLOGICAL SITE	DIR (DEG)	260	250	260	310	260	220	260	230	90	250
BRIDGEPORT	VEL (MPH)	3.8	6.3	7.9	5.4	7.7	1.4	0.6	6.3	12.2	7.5
	SPD (MPH)	4.6	6.5	8.6	6.2	7.9	3.9	3.3	8.3	13.7	7.8
	RATIO	0.833	0.974	0.912	0.872	0.970	0.356	0.184	0.755	0.891	0.962
METEOROLOGICAL SITE	DIR (DEG)	260	260	280	290	250	310	160	240	80	270
WORCESTER	VEL (MPH)	9.2	8.9	11.4	9.5	11.0	2.2	1.2	8.1	5.3	8.7
	SPD (MPH)	9.5	9.3	11.8	10.4	11.4	4.6	3.4	9.9	7.9	9.1
	RATIO	0.969	0.950	0.963	0.922	0.966	0.468	0.346	0.819	0.675	0.963
WATERBURY-123 (359)	SO2	133	102	96	95	93	92	86	78	75	75
	DATE	1/17/86	1/16/86	1/ 2/86	1/18/86	12/16/86	12/23/86	12/15/86	1/ 3/86	3/ 4/86	1/22/86
METEOROLOGICAL SITE	DIR (DEG)	170	220	220	210	210	230	240	290	180	250
NEWARK	VEL (MPH)	0.8	7.6	5.6	7.1	5.5	8.4	8.6	4.5	4.1	4.7
	SPD (MPH)	8.2	9.6	7.3	10.4	6.6	9.9	9.1	7.8	6.6	9.2
	RATIO	0.095	0.789	0.765	0.691	0.825	0.847	0.947	0.580	0.614	0.510
METEOROLOGICAL SITE	DIR (DEG)	190	170	210	180	210	240	260	10	220	220
BRADLEY	VEL (MPH)	4.3	1.0	7.3	6.4	1.8	4.6	8.4	3.7	4.0	4.9
	SPD (MPH)	4.5	2.6	8.1	6.6	3.4	8.1	11.2	5.0	6.2	8.3
	RATIO	0.974	0.384	0.901	0.971	0.522	0.571	0.752	0.727	0.646	0.593

TABLE 17, CONTINUED

1986 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGARMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	100	230	250	240	260	260	280	270	90	250
BRIDGEPORT	VEL (MPH)	0.2	2.9	4.7	5.6	0.6	7.9	6.7	3.1	3.2	3.2
	SPD (MPH)	5.6	4.7	4.9	6.3	3.3	8.6	7.5	7.2	3.6	8.2
	RATIO	0.028	0.614	0.963	0.888	0.184	0.912	0.899	0.429	0.904	0.396
METEOROLOGICAL SITE	DIR (DEG)	220	270	230	230	160	280	280	290	220	210
WORCESTER	VEL (MPH)	11.1	8.3	9.4	11.0	1.2	11.4	8.1	5.2	4.4	7.7
	SPD (MPH)	11.4	8.5	9.6	11.1	3.4	11.8	8.9	7.6	5.5	9.5
	RATIO	0.978	0.977	0.978	0.993	0.346	0.963	0.906	0.680	0.801	0.807

IV. OZONE

HEALTH EFFECTS

Ozone is a poisonous form of oxygen and the principal component of modern smog. Until recently, EPA called this type of pollution "photochemical oxidants." The name has been changed to ozone because ozone is the only oxidant actually measured and is the most plentiful.

Ozone and other oxidants -- including peroxyacetal nitrates (PAN), formaldehyde and peroxides -- are not usually emitted into the air directly. They are formed by chemical reactions in the air from two other pollutants: hydrocarbons and nitrogen oxides. Energy from sunlight is needed for these chemical reactions. This accounts for the term photochemical smog and the daily variation in ozone levels, which increase during the day and decrease at night.

Ozone is a pungent gas with a faintly bluish color. It irritates the mucous membranes of the respiratory system, causing coughing, choking and impaired lung function. It aggravates chronic respiratory diseases like asthma and bronchitis and is believed capable of hastening the death, by pneumonia, of persons in already weakened health. PAN and the other oxidants that accompany ozone are powerful eye irritants.

NATIONAL AMBIENT AIR QUALITY STANDARD

On February 8, 1979 the EPA established a national ambient air quality standard (NAAQS) for ozone of 0.12 ppm for a one-hour average. Compliance with this standard is determined by summing the number of days at each monitoring site over a consecutive three-year period when the 1-hour standard is exceeded and then computing the average number of exceedances over this interval. If the resulting average value is less than or equal to 1.0 (that is, if the fourth highest daily value in a consecutive three-year period is less than or equal to 0.12 ppm) the ozone standard is considered attained at the site. This standard replaces the old photochemical oxidant Standard of 0.08 ppm. The definition of the pollutant was changed along with the numerical value of the standard, partly because the instruments used to measure photochemical oxidants in the air really measure only ozone. Ozone is one of a group of chemicals which are formed photochemically in the air and are called photochemical oxidants. In the past, the two terms have often been used interchangeably. This 1986 Air Quality Summary uses the term "ozone" in conjunction with the NAAQS to reflect the change in both the numerical value of the NAAQS and the definition of the pollutant.

The EPA defines the ozone standard to two decimal places. Therefore, the standard is considered exceeded when a level of 0.13 ppm is reached. However, since the DEP still measures ozone levels to three decimal places, any one-hour average ozone reading which equals or is greater than 0.125 ppm is considered an exceedance of the 0.12 ppm standard in Connecticut. This interpretation of the ozone standard differs from the one used by the DEP before 1982, when a one-hour ozone concentration of 0.121 ppm was considered an exceedance of the standard.

CONCLUSIONS

As in past years, Connecticut experienced very high concentrations of ozone in the summer months of 1986. Levels in excess of the one-hour NAAQS of 0.12 ppm were frequently recorded at each of the ten monitored sites. No site experienced levels greater than 0.20 ppm in 1986, as opposed to two sites in 1985 and five sites in 1984. The highest one-hour concentrations decreased at all but the

Greenwich site in 1986, when compared to 1985, and all the sites experienced lower second highest concentrations in 1986.

The incidence of ozone levels in excess of the 1-hour 0.12 ppm standard was less in 1986 compared to 1985 (see Table 19). There was a total of 183 exceedances in 1985 and 70 in 1986 at those monitored sites that operated in both years. This represents a drop in the frequency of such exceedances from 4.6 per 1000 sampling hours in 1985 to 1.5 per 1000 sampling hours in 1986: a 68% decrease. If one eliminates the duplication that results when two or more sites experience an exceedance in the same hour, then the number of exceedances decreased from 81 to 37. On this basis, the state experienced a 62% decrease in the frequency of hourly exceedances of the standard.

The number of days on which the ozone monitors experienced ozone levels in excess of the 1-hour standard decreased from 73 in 1985 to 33 in 1986 at those monitoring sites that operated in both years (see Table 18). This represents a decrease in the frequency of such occurrences from 4.4 per 100 sampling days in 1985 to 1.7 per 100 sampling days in 1986: a 62% decrease. If the duplication that results when two or more sites experience an exceedance on the same day is eliminated, then the number of exceedances decreased from 22 to 10. On this basis, the state experienced a 62% drop in the frequency of daily exceedances of the standard.

The yearly changes in ozone concentrations can usually be attributed to year-to-year variations in regional weather conditions, especially wind direction, temperature and the amount of sunlight. In addition, a large portion of the peak ozone concentrations in Connecticut is caused by the transport of ozone and/or precursors (i.e., hydrocarbons and nitrogen oxides) from the New York City area and other points to the west and southwest. A decrease in the frequency of winds out of the southwest could help to explain the drop in the number of ozone exceedances from 1985 to 1986. However, the percentage of southwest winds during the "ozone season" remained about the same from 1985 to 1986, as is shown by the wind roses from Newark (Figures 9 and 10)--the wind roses from Bradley (Figures 7 and 8) are believed to be not as representative, since the airport is located in the Connecticut River Valley and the wind gets channeled up or down the valley. The magnitude of the high ozone levels can be partly associated with yearly variations in temperature, since ozone production is greatest at high temperatures and in strong sunlight. However, the summer season's daily high temperatures and the percentage of possible sunshine were not significantly different in 1985 and 1986. Clearly, the foregoing meteorological factors considered separately are insufficient by themselves to explain the decrease in ozone levels from 1985 to 1986.

A recent study (see publication no. ~~31~~ 30 in section XIII. Publications) suggests that most of the improvement in the ozone levels between 1985 and 1986 can be attributed to two factors. The first is ongoing reductions in ozone precursors emissions, which are estimated to account for approximately 25% of the decrease in ozone exceedance days. The second factor is a decrease in the incidence of ozone "exceedance conducive days." Such days reflect <u>both</u> high maximum daily temperatures and the frequency of winds out of the southwest. The decrease in the frequency of ozone exceedance conducive days between 1985 and 1986 is estimated to account for approximately 75% of the decrease in ozone exceedance days.

METHOD OF MEASUREMENT

The DEP Air Monitoring Unit uses chemiluminescent instruments to measure and record instantaneous concentrations of ozone continuously by means of a fluorescent technique. Properly calibrated, these instruments are shown to be remarkably reliable and stable.

DISCUSSION OF DATA

Monitoring Network - In order to gather information which will further the understanding of ozone production and transport, and to provide real-time data for the daily Pollutant Standards Index, DEP operated a state-wide ozone monitoring network consisting of four types of sites in 1986 (see Figure 6):

Urban	- Bridgeport, East Hartford, Middletown, New Haven
Advection from Southwest	- Danbury, Greenwich
Suburban	- Groton, Madison, Stratford
Rural	- Stafford

Precision and Accuracy - The ozone monitors had a total of 221 precision checks during 1986. The resulting 95% probability limits were -7% to +8%. Accuracy is determined by introducing a known amount of ozone into each of the monitors. Three different concentration levels are tested: low, medium, and high. The 95% probability limits, based on 10 audits conducted on the monitoring system, were: low, -9% to +1%; medium, -10% to 0%; and high, -14% to +5%.

1-Hour Average - The 1-hour ozone standard was exceeded at all ten DEP monitoring sites in 1986. Moreover, the highest 1-hour average ozone concentrations were lower in 1986 than in 1985 at all the sites except Greenwich 017. Madison 002 had the largest decrease of 0.066 ppm.

The number of days on which the 1-hour standard was exceeded at each site during the summertime "ozone season" is presented in Table 18. The number of hours the ozone standard was exceeded is presented in Table 19 for each site. Table 20 shows the year's high and second high concentrations at each site.

10 High Days with Wind Data - Table 21 lists the ten highest 1-hour ozone averages and their dates of occurrence for each ozone site in 1986. The wind data associated with these high readings are also presented. (See the discussion of Table 11 in the TSP section for a description of the origin and use of these wind data.)

A majority (i.e., 66%) of the high ozone levels occurred on days with southwesterly winds. This is due to the special features of a southwest wind blowing over Connecticut. The first aspect of a southwest wind is that, during the summer, it usually accompanies high temperatures and bright sunshine, which are important to the production of ozone. The second is that it will transport precursor emissions from New York City and other urban areas to the southwest of Connecticut. It is the combination of these factors that often produces unhealthful ozone levels in Connecticut.

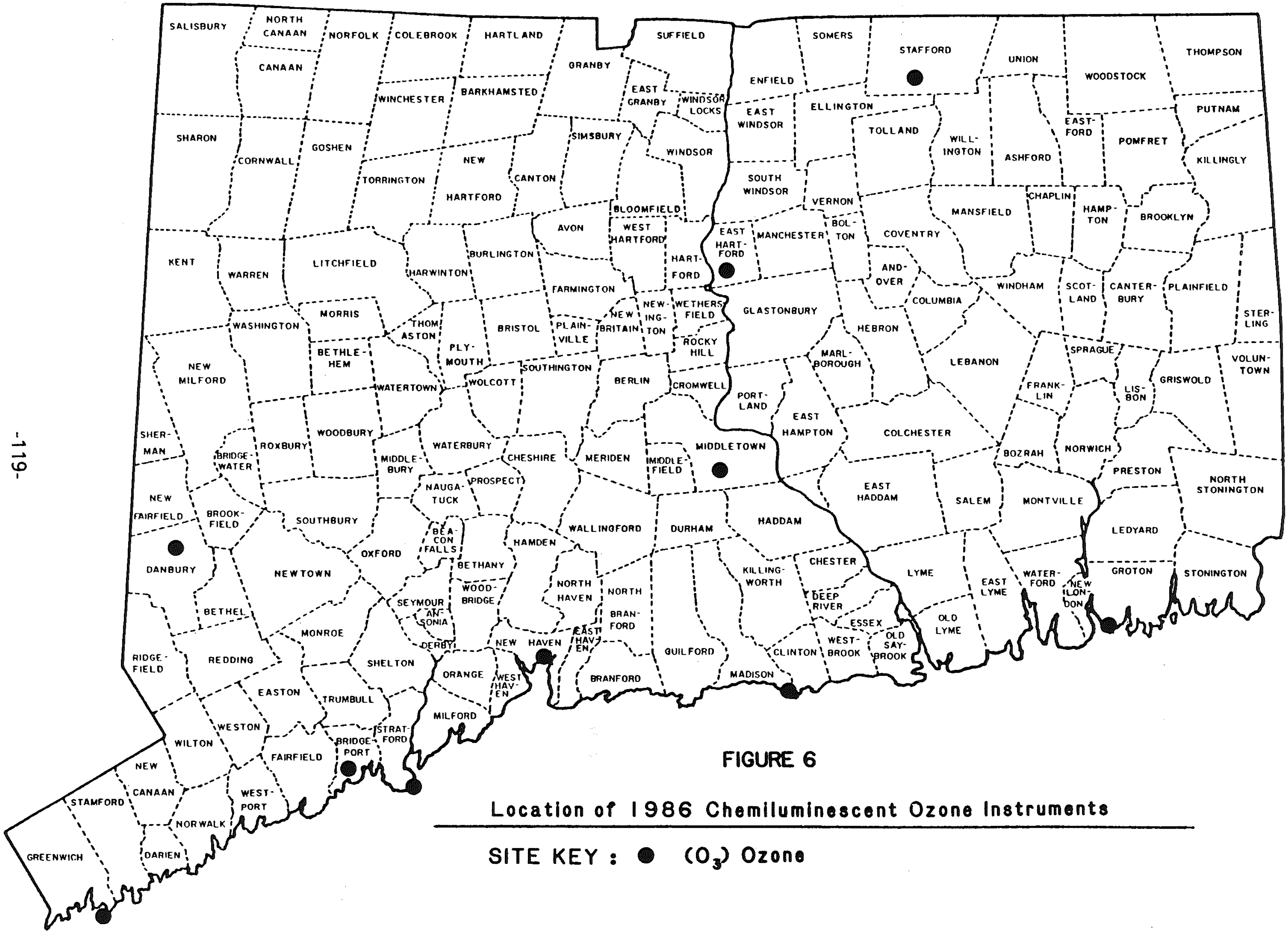


FIGURE 6

Location of 1986 Chemiluminescent Ozone Instruments

SITE KEY : ● (O_3) Ozone

TABLE 18

NUMBER OF DAYS WHEN THE 1-HOUR OZONE STANDARD WAS EXCEEDED IN 1986

SITE	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	TOTAL	TOTAL FOR LAST YEAR
Bridgeport-123	0	0	3	2	0	1	6	4
Danbury-123	0	0	1	0	0	0	1	4
E. Hartford-003	0	0	1	0	0	0	1	3
Greenwich-017	0	0	2	1	0	0	3	13
Groton-008	0	0	3	2	0	0	5	9
Madison-002	0	0	2	2	0	0	4	7
Middletown-007	0	0	2	0	0	0	2	10
New Haven-123	0	0	2	0	0	0	2	6
Stafford-~~007~~ 001	0	0	1	0	0	0	1	4
Stratford-007	0	0	4	3	0	1	8	13
						TOTAL SITE DAYS	33	73
						TOTAL INDIVIDUAL DAYS	10	22

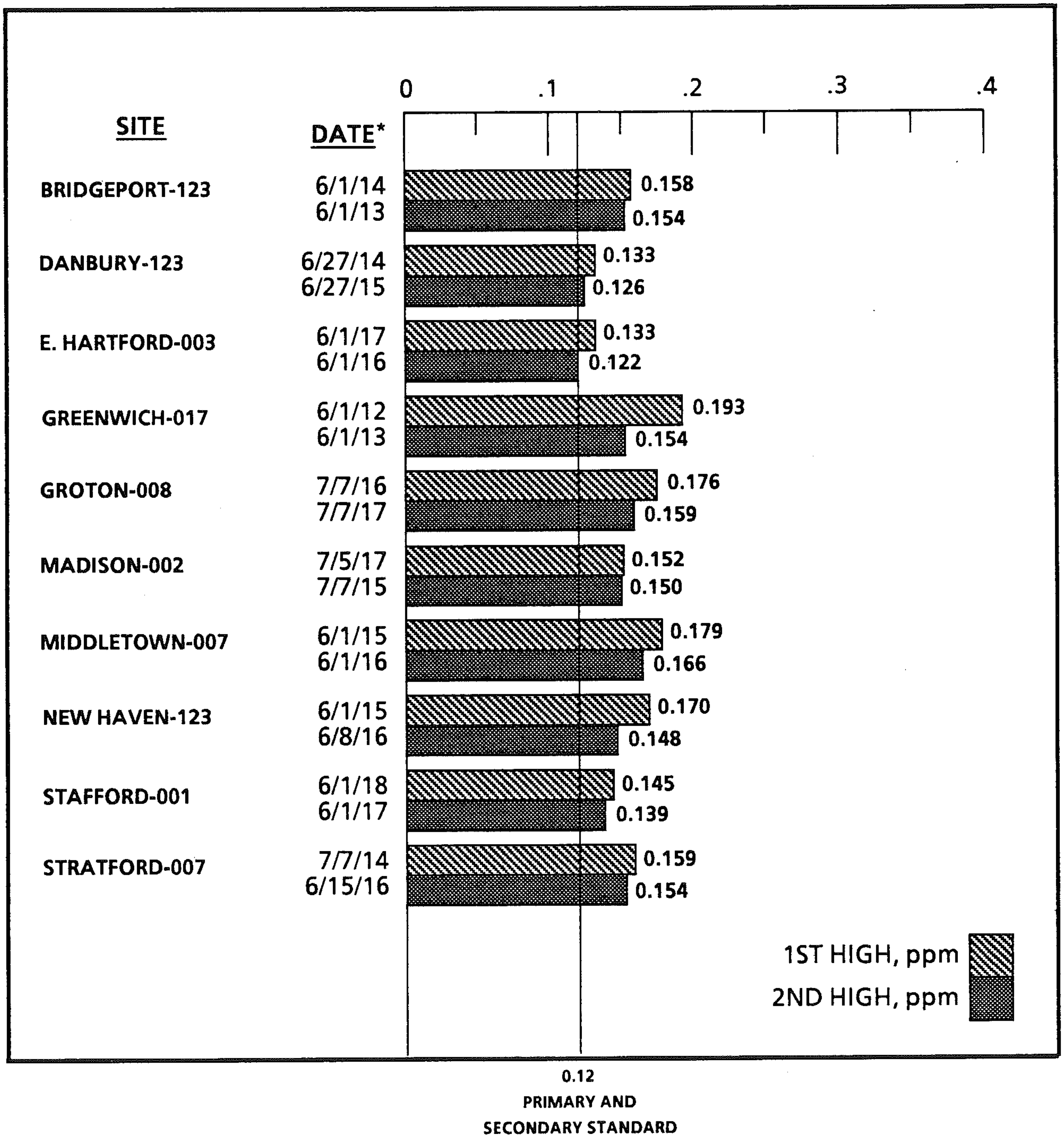
TABLE 19

NUMBER OF EXCEEDANCES OF THE 1-HOUR OZONE STANDARD IN 1986

SITE	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	TOTAL	TOTAL FOR LAST YEAR
Bridgeport-123	0	0	7	4	0	1	12	10
Danbury-123	0	0	2	0	0	0	2	6
E. Hartford-003	0	0	1	0	0	0	1	4
Greenwich-017	0	0	4	2	0	0	6	25
Groton-008	0	0	5	5	0	0	10	31
Madison-002	0	0	2	8	0	0	10	21
Middletown-007	0	0	5	0	0	0	5	22
New Haven-123	0	0	2	0	0	0	2	14
Stafford-~~007~~ 001	0	0	2	0	0	0	2	11
Stratford-007	0	0	8	9	0	3	20	39
						TOTAL SITE HOURS	70	183
						TOTAL INDIVIDUAL HOURS	37	81

TABLE 20

1986 MAXIMUM 1-HOUR OZONE CONCENTRATIONS



* Date is month/day/ending hour of occurrence.

N.B. When a listed concentration occurs more than once at a site, the earliest date is given first.

TABLE 21

1986 TEN HIGHEST 1-HOUR AVERAGE OZONE DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BRIDGEPORT-123 (4783)	OZONE	0.158	0.139	0.136	0.131	0.130	0.126	0.118	0.115	0.113	0.112
	DATE	6/ 1/86	7/ 5/86	6/ 8/86	6/15/86	9/ 1/86	7/ 7/86	7/17/86	8/ 2/86	7/24/86	7/23/86
METEOROLOGICAL SITE	DIR (DEG)	230	240	260	210	180	300	120	110	170	210
NEWARK	VEL (MPH)	11.7	10.4	5.8	9.5	4.8	8.0	3.1	4.2	7.5	2.9
	SPD (MPH)	14.1	10.9	12.1	11.2	7.0	8.9	5.6	7.0	8.2	6.3
	RATIO	0.831	0.953	0.478	0.849	0.687	0.896	0.558	0.591	0.919	0.452
METEOROLOGICAL SITE	DIR (DEG)	210	200	270	230	210	260	220	200	210	270
BRADLEY	VEL (MPH)	6.6	8.8	5.4	2.3	3.4	5.4	3.3	5.5	5.6	3.2
	SPD (MPH)	10.8	9.9	7.6	5.3	4.6	9.1	6.0	8.2	7.2	5.9
	RATIO	0.614	0.888	0.711	0.431	0.749	0.598	0.547	0.673	0.783	0.542
METEOROLOGICAL SITE	DIR (DEG)	200	240	240	210	200	240	140	130	210	180
BRIDGEPORT	VEL (MPH)	7.2	9.8	6.7	5.9	3.3	7.5	3.3	1.8	5.6	4.4
	SPD (MPH)	9.3	9.8	6.8	6.3	5.3	7.8	5.6	5.2	6.0	5.2
	RATIO	0.769	0.998	0.997	0.937	0.621	0.971	0.593	0.344	0.931	0.844
METEOROLOGICAL SITE	DIR (DEG)	240	270	260	270	260	280	250	260	250	280
WORCESTER	VEL (MPH)	8.2	10.9	6.4	6.8	4.9	9.9	4.2	6.1	7.6	5.9
	SPD (MPH)	10.1	11.1	8.5	7.0	5.8	11.5	5.0	6.5	8.5	6.2
	RATIO	0.814	0.986	0.756	0.962	0.846	0.862	0.844	0.943	0.898	0.952
DANBURY-123 (4717)	OZONE	0.133	0.119	0.119	0.115	0.114	0.113	0.111	0.111	0.110	0.108
	DATE	6/27/86	8/10/86	8/ 6/86	7/25/86	9/ 1/86	6/ 5/86	7/18/86	7/24/86	7/ 6/86	6/ 1/86
METEOROLOGICAL SITE	DIR (DEG)	210	160	200	160	180	210	190	170	260	230
NEWARK	VEL (MPH)	10.6	4.8	9.3	8.2	4.8	15.3	0.5	7.5	7.5	11.7
	SPD (MPH)	12.9	7.5	10.4	9.1	7.0	15.5	7.2	8.2	8.3	14.1
	RATIO	0.818	0.640	0.899	0.902	0.687	0.984	0.073	0.919	0.900	0.831
METEOROLOGICAL SITE	DIR (DEG)	200	240	200	200	210	170	200	210	200	210
BRADLEY	VEL (MPH)	10.4	5.8	9.3	10.8	3.4	4.9	2.1	5.6	5.4	6.6
	SPD (MPH)	10.5	7.9	9.8	10.9	4.6	7.8	5.8	7.2	7.8	10.8
	RATIO	0.987	0.728	0.949	0.992	0.749	0.632	0.362	0.783	0.693	0.614
METEOROLOGICAL SITE	DIR (DEG)	210	190	230	200	200	230	150	210	140	200
BRIDGEPORT	VEL (MPH)	7.2	4.1	7.3	7.0	3.3	7.9	3.7	5.6	0.9	7.2
	SPD (MPH)	7.6	4.5	8.1	7.2	5.3	8.1	5.0	6.0	8.5	9.3
	RATIO	0.947	0.926	0.906	0.972	0.621	0.986	0.733	0.931	0.110	0.769
METEOROLOGICAL SITE	DIR (DEG)	220	270	240	230	260	250	270	250	110	240
WORCESTER	VEL (MPH)	7.7	5.9	9.9	10.6	4.9	7.9	3.5	7.6	2.9	8.2
	SPD (MPH)	8.6	7.0	10.4	11.2	5.8	8.5	4.0	8.5	4.9	10.1
	RATIO	0.887	0.836	0.956	0.948	0.846	0.931	0.872	0.898	0.587	0.814
EAST HARTFORD-003 (4852)	OZONE	0.133	0.101	0.097	0.097	0.092	0.090	0.088	0.085	0.081	0.080
	DATE	6/ 1/86	7/24/86	9/13/86	8/ 6/86	8/15/86	6/27/86	6/15/86	9/ 1/86	5/18/86	5/27/86
METEOROLOGICAL SITE	DIR (DEG)	230	170	310	200	160	210	210	180	140	240
NEWARK	VEL (MPH)	11.7	7.5	9.9	9.3	5.8	10.6	9.5	4.8	6.8	14.5
	SPD (MPH)	14.1	8.2	11.4	10.4	8.2	12.9	11.2	7.0	11.5	15.7
	RATIO	0.831	0.919	0.873	0.899	0.709	0.818	0.849	0.687	0.592	0.927
METEOROLOGICAL SITE	DIR (DEG)	210	210	300	200	210	200	230	210	200	190
BRADLEY	VEL (MPH)	6.6	5.6	10.1	9.3	8.4	10.4	2.3	3.4	7.7	8.0
	SPD (MPH)	10.8	7.2	10.8	9.8	8.6	10.5	5.3	4.6	8.9	9.1
	RATIO	0.614	0.783	0.941	0.949	0.978	0.987	0.431	0.749	0.864	0.888

TABLE 21, CONTINUED

1986 TEN HIGHEST 1-HOUR AVERAGE OZONE DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	200	210	320	230	200	210	210	200	90	220
BRIDGEPORT	VEL (MPH)	7.2	5.6	4.8	7.3	4.0	7.2	5.9	3.3	3.1	2.8
	SPD (MPH)	9.3	6.0	6.5	8.1	5.8	7.6	6.3	5.3	5.2	7.0
	RATIO	0.769	0.931	0.736	0.906	0.691	0.947	0.937	0.621	0.597	0.401
METEOROLOGICAL SITE	DIR (DEG)	240	250	300	240	250	220	270	260	250	270
WORCESTER	VEL (MPH)	8.2	7.6	9.0	9.9	7.9	7.7	6.8	4.9	6.8	6.0
	SPD (MPH)	10.1	8.5	9.3	10.4	8.6	8.6	7.0	5.8	7.8	6.9
	RATIO	0.814	0.898	0.964	0.956	0.919	0.887	0.962	0.846	0.875	0.863
GREENWICH-017 (4609)	OZONE	0.193	0.136	0.125	0.121	0.120	0.118	0.118	0.117	0.113	0.112
	DATE	6/ 1/86	7/ 7/86	6/15/86	9/ 1/86	6/22/86	8/ 1/86	7/23/86	7/17/86	7/ 6/86	8/ 6/86
METEOROLOGICAL SITE	DIR (DEG)	230	300	210	180	220	220	210	120	260	200
NEWARK	VEL (MPH)	11.7	8.0	9.5	4.8	6.6	6.3	2.9	3.1	7.5	9.3
	SPD (MPH)	14.1	8.9	11.2	7.0	10.5	7.3	6.3	5.6	8.3	10.4
	RATIO	0.831	0.896	0.849	0.687	0.627	0.863	0.452	0.558	0.900	0.899
METEOROLOGICAL SITE	DIR (DEG)	210	260	230	210	240	190	270	220	200	200
BRADLEY	VEL (MPH)	6.6	5.4	2.3	3.4	3.1	8.1	3.2	3.3	5.4	9.3
	SPD (MPH)	10.8	9.1	5.3	4.6	5.3	8.2	5.9	6.0	7.8	9.8
	RATIO	0.614	0.598	0.431	0.749	0.576	0.989	0.542	0.547	0.693	0.949
METEOROLOGICAL SITE	DIR (DEG)	200	240	210	200	210	180	180	140	140	230
BRIDGEPORT	VEL (MPH)	7.2	7.5	5.9	3.3	7.0	5.3	4.4	3.3	0.9	7.3
	SPD (MPH)	9.3	7.8	6.3	5.3	7.3	6.3	5.2	5.6	8.5	8.1
	RATIO	0.769	0.971	0.937	0.621	0.961	0.842	0.844	0.593	0.110	0.906
METEOROLOGICAL SITE	DIR (DEG)	240	280	270	260	280	220	280	250	110	240
WORCESTER	VEL (MPH)	8.2	9.9	6.8	4.9	5.9	6.4	5.9	4.2	2.9	9.9
	SPD (MPH)	10.1	11.5	7.0	5.8	6.5	6.9	6.2	5.0	4.9	10.4
	RATIO	0.814	0.862	0.962	0.846	0.907	0.921	0.952	0.844	0.587	0.956
GROTON-008 (4736)	OZONE	0.176	0.144	0.134	0.131	0.126	0.124	0.122	0.117	0.110	0.107
	DATE	7/ 7/86	6/23/86	6/15/86	7/ 5/86	6/ 1/86	5/31/86	7/23/86	5/30/86	6/22/86	6/28/86
METEOROLOGICAL SITE	DIR (DEG)	300	270	210	240	230	270	210	260	220	240
NEWARK	VEL (MPH)	8.0	12.5	9.5	10.4	11.7	8.3	2.9	12.2	6.6	9.6
	SPD (MPH)	8.9	16.2	11.2	10.9	14.1	12.4	6.3	13.4	10.5	9.8
	RATIO	0.896	0.768	0.849	0.953	0.831	0.668	0.452	0.911	0.627	0.979
METEOROLOGICAL SITE	DIR (DEG)	260	250	230	200	210	280	270	270	240	240
BRADLEY	VEL (MPH)	5.4	6.3	2.3	8.8	6.6	3.0	3.2	5.4	3.1	6.9
	SPD (MPH)	9.1	9.3	5.3	9.9	10.8	6.2	5.9	7.9	5.3	7.5
	RATIO	0.598	0.676	0.431	0.888	0.614	0.484	0.542	0.677	0.576	0.927
METEOROLOGICAL SITE	DIR (DEG)	240	270	210	240	200	220	180	220	210	250
BRIDGEPORT	VEL (MPH)	7.5	6.8	5.9	9.8	7.2	4.6	4.4	8.5	7.0	7.2
	SPD (MPH)	7.8	9.2	6.3	9.8	9.3	7.6	5.2	8.8	7.3	7.5
	RATIO	0.971	0.744	0.937	0.998	0.769	0.601	0.844	0.969	0.961	0.969
METEOROLOGICAL SITE	DIR (DEG)	280	270	270	270	240	290	280	290	280	270
WORCESTER	VEL (MPH)	9.9	10.2	6.8	10.9	8.2	3.6	5.9	10.3	5.9	10.5
	SPD (MPH)	11.5	10.8	7.0	11.1	10.1	8.2	6.2	10.6	6.5	11.5
	RATIO	0.862	0.949	0.962	0.986	0.814	0.440	0.952	0.966	0.907	0.916

TABLE 21, CONTINUED

1986 TEN HIGHEST 1-HOUR AVERAGE OZONE DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
MADISON-002 (4821)	OZONE	0.152	0.150	0.128	0.126	0.120	0.118	0.111	0.111	0.110	0.106
	DATE	7/ 5/86	7/ 7/86	6/23/86	6/ 8/86	5/31/86	6/15/86	7/23/86	6/11/86	6/22/86	5/30/86
METEOROLOGICAL SITE	DIR (DEG)	240	300	270	260	270	210	210	230	220	260
NEWARK	VEL (MPH)	10.4	8.0	12.5	5.8	8.3	9.5	2.9	11.3	6.6	12.2
	SPD (MPH)	10.9	8.9	16.2	12.1	12.4	11.2	6.3	17.4	10.5	13.4
	RATIO	0.953	0.896	0.768	0.478	0.668	0.849	0.452	0.647	0.627	0.911
METEOROLOGICAL SITE	DIR (DEG)	200	260	250	270	280	230	270	210	240	270
BRADLEY	VEL (MPH)	8.8	5.4	6.3	5.4	3.0	2.3	3.2	3.3	3.1	5.4
	SPD (MPH)	9.9	9.1	9.3	7.6	6.2	5.3	5.9	9.1	5.3	7.9
	RATIO	0.888	0.598	0.676	0.711	0.484	0.431	0.542	0.365	0.576	0.677
METEOROLOGICAL SITE	DIR (DEG)	240	240	270	240	220	210	180	230	210	220
BRIDGEPORT	VEL (MPH)	9.8	7.5	6.8	6.7	4.6	5.9	4.4	6.3	7.0	8.5
	SPD (MPH)	9.8	7.8	9.2	6.8	7.6	6.3	5.2	9.5	7.3	8.8
	RATIO	0.998	0.971	0.744	0.997	0.601	0.937	0.844	0.666	0.961	0.969
METEOROLOGICAL SITE	DIR (DEG)	270	280	270	260	290	270	280	250	280	290
WORCESTER	VEL (MPH)	10.9	9.9	10.2	6.4	3.6	6.8	5.9	5.7	5.9	10.3
	SPD (MPH)	11.1	11.5	10.8	8.5	8.2	7.0	6.2	9.6	6.5	10.6
	RATIO	0.986	0.862	0.949	0.756	0.440	0.962	0.952	0.597	0.907	0.966
MIDDLETOWN-007 (4752)	OZONE	0.179	0.134	0.118	0.109	0.108	0.104	0.103	0.103	0.102	0.100
	DATE	6/ 1/86	6/ 8/86	7/24/86	6/15/86	8/ 6/86	5/31/86	6/22/86	7/18/86	5/27/86	7/ 5/86
METEOROLOGICAL SITE	DIR (DEG)	230	260	170	210	200	270	220	190	240	240
NEWARK	VEL (MPH)	11.7	5.8	7.5	9.5	9.3	8.3	6.6	0.5	14.5	10.4
	SPD (MPH)	14.1	12.1	8.2	11.2	10.4	12.4	10.5	7.2	15.7	10.9
	RATIO	0.831	0.478	0.919	0.849	0.899	0.668	0.627	0.073	0.927	0.953
METEOROLOGICAL SITE	DIR (DEG)	210	270	210	230	200	280	240	200	190	200
BRADLEY	VEL (MPH)	6.6	5.4	5.6	2.3	9.3	3.0	3.1	2.1	8.0	8.8
	SPD (MPH)	10.8	7.6	7.2	5.3	9.8	6.2	5.3	5.8	9.1	9.9
	RATIO	0.614	0.711	0.783	0.431	0.949	0.484	0.576	0.362	0.888	0.888
METEOROLOGICAL SITE	DIR (DEG)	200	240	210	210	230	220	210	150	220	240
BRIDGEPORT	VEL (MPH)	7.2	6.7	5.6	5.9	7.3	4.6	7.0	3.7	2.8	9.8
	SPD (MPH)	9.3	6.8	6.0	6.3	8.1	7.6	7.3	5.0	7.0	9.8
	RATIO	0.769	0.997	0.931	0.937	0.906	0.601	0.961	0.733	0.401	0.998
METEOROLOGICAL SITE	DIR (DEG)	240	260	250	270	240	290	280	270	270	270
WORCESTER	VEL (MPH)	8.2	6.4	7.6	6.8	9.9	3.6	5.9	3.5	6.0	10.9
	SPD (MPH)	10.1	8.5	8.5	7.0	10.4	8.2	6.5	4.0	6.9	11.1
	RATIO	0.814	0.756	0.898	0.962	0.956	0.440	0.907	0.872	0.863	0.986
NEW HAVEN-123 (4878)	OZONE	0.170	0.148	0.123	0.117	0.117	0.108	0.102	0.099	0.098	0.094
	DATE	6/ 1/86	6/ 8/86	7/ 5/86	9/ 1/86	6/15/86	7/23/86	5/18/86	6/22/86	7/ 6/86	7/24/86
METEOROLOGICAL SITE	DIR (DEG)	230	260	240	180	210	210	140	220	260	170
NEWARK	VEL (MPH)	11.7	5.8	10.4	4.8	9.5	2.9	6.8	6.6	7.5	7.5
	SPD (MPH)	14.1	12.1	10.9	7.0	11.2	6.3	11.5	10.5	8.3	8.2
	RATIO	0.831	0.478	0.953	0.687	0.849	0.452	0.592	0.627	0.900	0.919
METEOROLOGICAL SITE	DIR (DEG)	210	270	200	210	230	270	200	240	200	210
BRADLEY	VEL (MPH)	6.6	5.4	8.8	3.4	2.3	3.2	7.7	3.1	5.4	5.6
	SPD (MPH)	10.8	7.6	9.9	4.6	5.3	5.9	8.9	5.3	7.8	7.2
	RATIO	0.614	0.711	0.888	0.749	0.431	0.542	0.864	0.576	0.693	0.783

TABLE 21, CONTINUED

1986 TEN HIGHEST 1-HOUR AVERAGE OZONE DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	200	240	240	200	210	180	90	210	140	210
BRIDGEPORT	VEL (MPH)	7.2	6.7	9.8	3.3	5.9	4.4	3.1	7.0	0.9	5.6
	SPD (MPH)	9.3	6.8	9.8	5.3	6.3	5.2	5.2	7.3	8.5	6.0
	RATIO	0.769	0.997	0.998	0.621	0.937	0.844	0.597	0.961	0.110	0.931
METEOROLOGICAL SITE	DIR (DEG)	240	260	270	260	270	280	250	280	110	250
WORCESTER	VEL (MPH)	8.2	6.4	10.9	4.9	6.8	5.9	6.8	5.9	2.9	7.6
	SPD (MPH)	10.1	8.5	11.1	5.8	7.0	6.2	7.8	6.5	4.9	8.5
	RATIO	0.814	0.756	0.986	0.846	0.962	0.952	0.875	0.907	0.587	0.898
STAFFORD-001 (4751)	OZONE	0.145	0.112	0.108	0.106	0.101	0.098	0.097	0.097	0.092	0.092
	DATE	6/ 1/86	7/24/86	8/15/86	8/ 6/86	6/27/86	4/29/86	6/ 4/86	6/15/86	5/18/86	5/27/86
METEOROLOGICAL SITE	DIR (DEG)	230	170	160	200	210	160	200	210	140	240
NEWARK	VEL (MPH)	11.7	7.5	5.8	9.3	10.6	4.8	14.4	9.5	6.8	14.5
	SPD (MPH)	14.1	8.2	8.2	10.4	12.9	7.6	16.0	11.2	11.5	15.7
	RATIO	0.831	0.919	0.709	0.899	0.818	0.636	0.902	0.849	0.592	0.927
METEOROLOGICAL SITE	DIR (DEG)	210	210	210	200	200	190	210	230	200	190
BRADLEY	VEL (MPH)	6.6	5.6	8.4	9.3	10.4	8.9	12.6	2.3	7.7	8.0
	SPD (MPH)	10.8	7.2	8.6	9.8	10.5	9.5	12.9	5.3	8.9	9.1
	RATIO	0.614	0.783	0.978	0.949	0.987	0.936	0.977	0.431	0.864	0.888
METEOROLOGICAL SITE	DIR (DEG)	200	210	200	230	210	130	220	210	90	220
BRIDGEPORT	VEL (MPH)	7.2	5.6	4.0	7.3	7.2	3.5	8.7	5.9	3.1	2.8
	SPD (MPH)	9.3	6.0	5.8	8.1	7.6	6.0	9.3	6.3	5.2	7.0
	RATIO	0.769	0.931	0.691	0.906	0.947	0.576	0.932	0.937	0.597	0.401
METEOROLOGICAL SITE	DIR (DEG)	240	250	250	240	220	190	240	270	250	270
WORCESTER	VEL (MPH)	8.2	7.6	7.9	9.9	7.7	4.7	13.7	6.8	6.8	6.0
	SPD (MPH)	10.1	8.5	8.6	10.4	8.6	7.8	13.8	7.0	7.8	6.9
	RATIO	0.814	0.898	0.919	0.956	0.887	0.608	0.989	0.962	0.875	0.863
STRATFORD-007 (4860)	OZONE	0.159	0.154	0.145	0.142	0.140	0.135	0.131	0.129	0.123	0.122
	DATE	7/ 7/86	6/15/86	7/23/86	7/ 5/86	9/ 1/86	6/ 8/86	6/22/86	6/ 1/86	6/23/86	7/18/86
METEOROLOGICAL SITE	DIR (DEG)	300	210	210	240	180	260	220	230	270	190
NEWARK	VEL (MPH)	8.0	9.5	2.9	10.4	4.8	5.8	6.6	11.7	12.5	0.5
	SPD (MPH)	8.9	11.2	6.3	10.9	7.0	12.1	10.5	14.1	16.2	7.2
	RATIO	0.896	0.849	0.452	0.953	0.687	0.478	0.627	0.831	0.768	0.073
METEOROLOGICAL SITE	DIR (DEG)	260	230	270	200	210	270	240	210	250	200
BRADLEY	VEL (MPH)	5.4	2.3	3.2	8.8	3.4	5.4	3.1	6.6	6.3	2.1
	SPD (MPH)	9.1	5.3	5.9	9.9	4.6	7.6	5.3	10.8	9.3	5.8
	RATIO	0.598	0.431	0.542	0.888	0.749	0.711	0.576	0.614	0.676	0.362
METEOROLOGICAL SITE	DIR (DEG)	240	210	180	240	200	240	210	200	270	150
BRIDGEPORT	VEL (MPH)	7.5	5.9	4.4	9.8	3.3	6.7	7.0	7.2	6.8	3.7
	SPD (MPH)	7.8	6.3	5.2	9.8	5.3	6.8	7.3	9.3	9.2	5.0
	RATIO	0.971	0.937	0.844	0.998	0.621	0.997	0.961	0.769	0.744	0.733
METEOROLOGICAL SITE	DIR (DEG)	280	270	280	270	260	260	280	240	270	270
WORCESTER	VEL (MPH)	9.9	6.8	5.9	10.9	4.9	6.4	5.9	8.2	10.2	3.5
	SPD (MPH)	11.5	7.0	6.2	11.1	5.8	8.5	6.5	10.1	10.8	4.0
	RATIO	0.862	0.962	0.952	0.986	0.846	0.756	0.907	0.814	0.949	0.872

FIGURE 7

WIND ROSE FOR APRIL - SEPTEMBER 1985
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

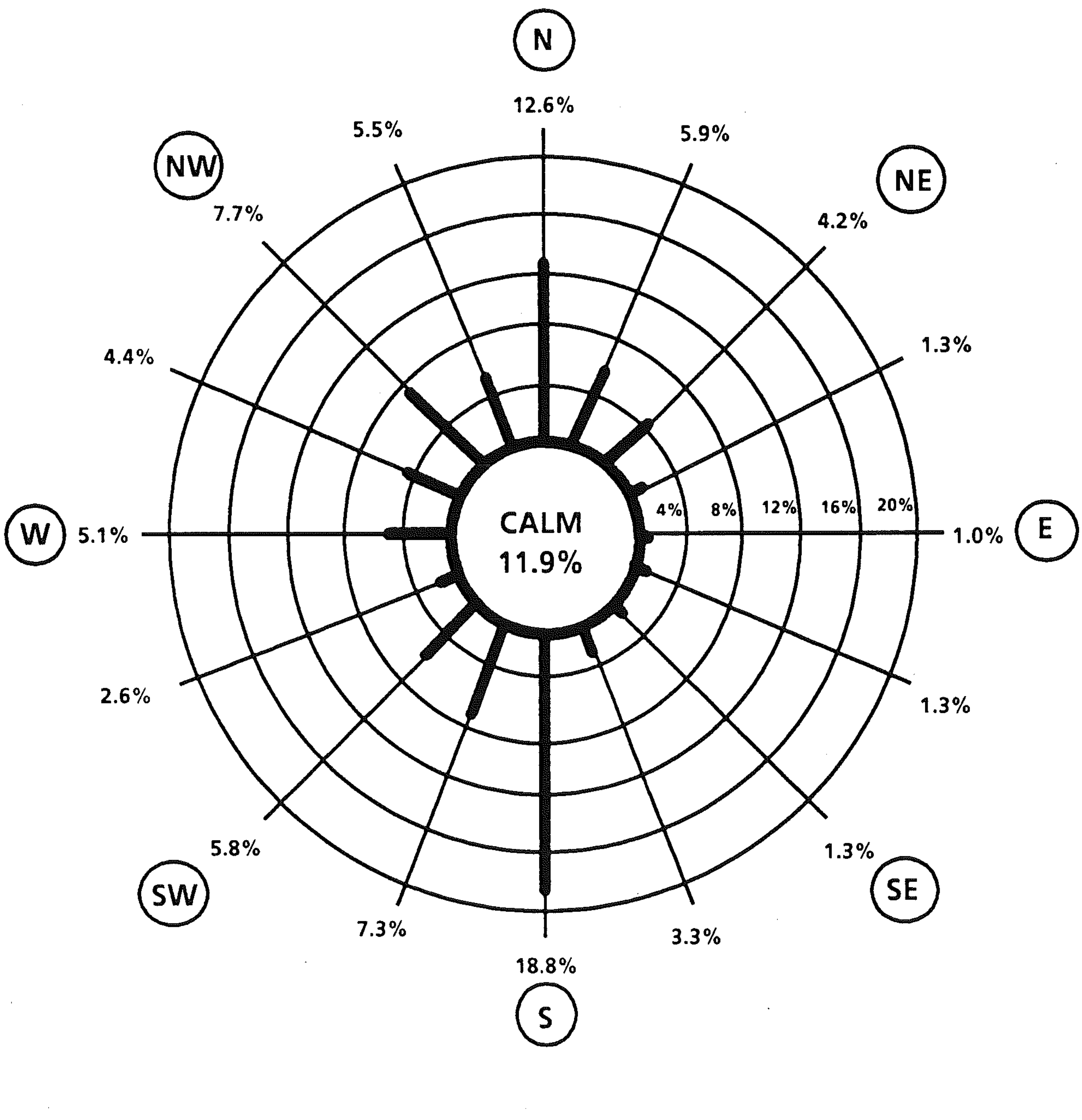


FIGURE 8

WIND ROSE FOR APRIL - SEPTEMBER 1986
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

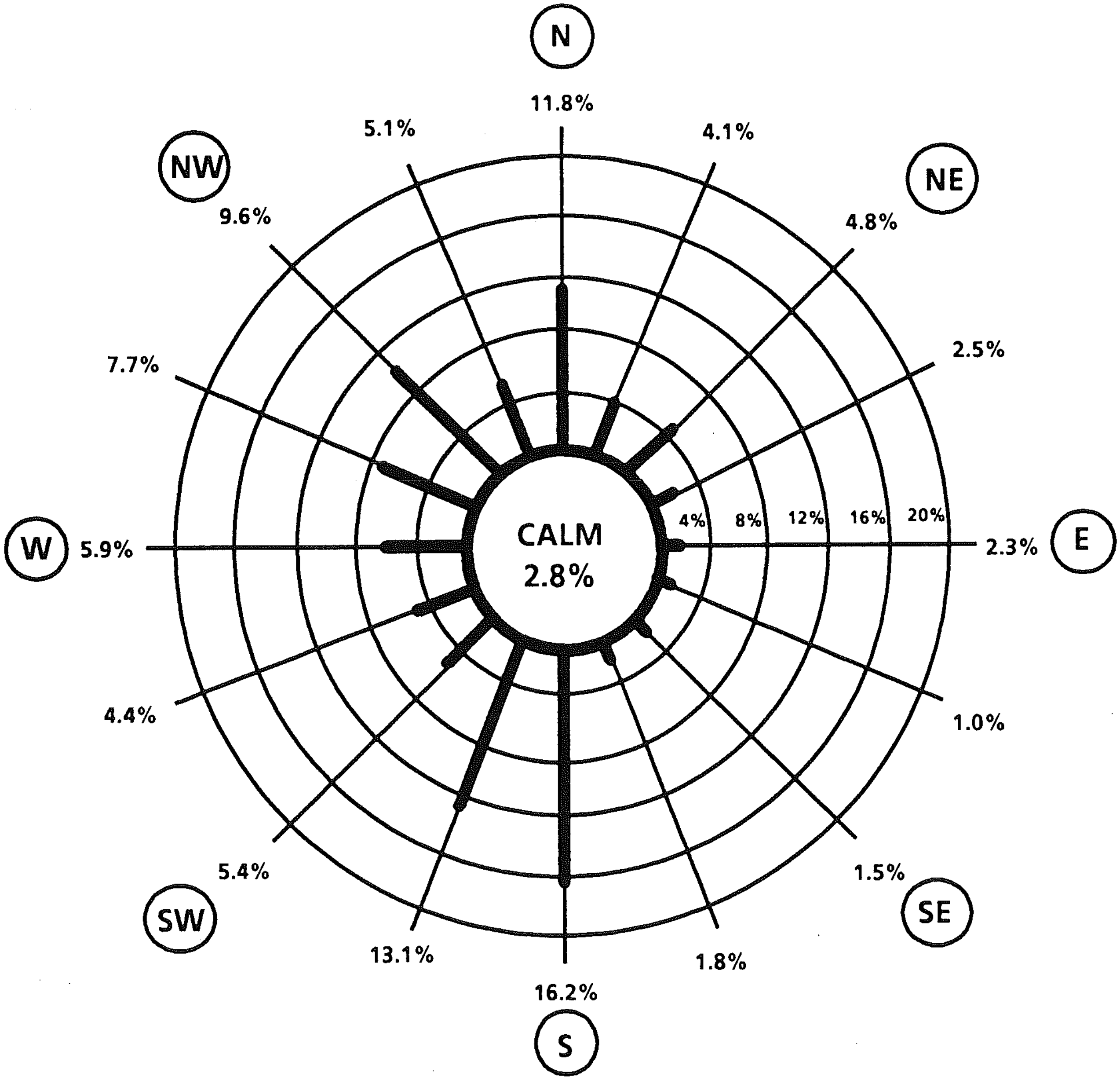


FIGURE 9

WIND ROSE FOR APRIL - SEPTEMBER 1985
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY

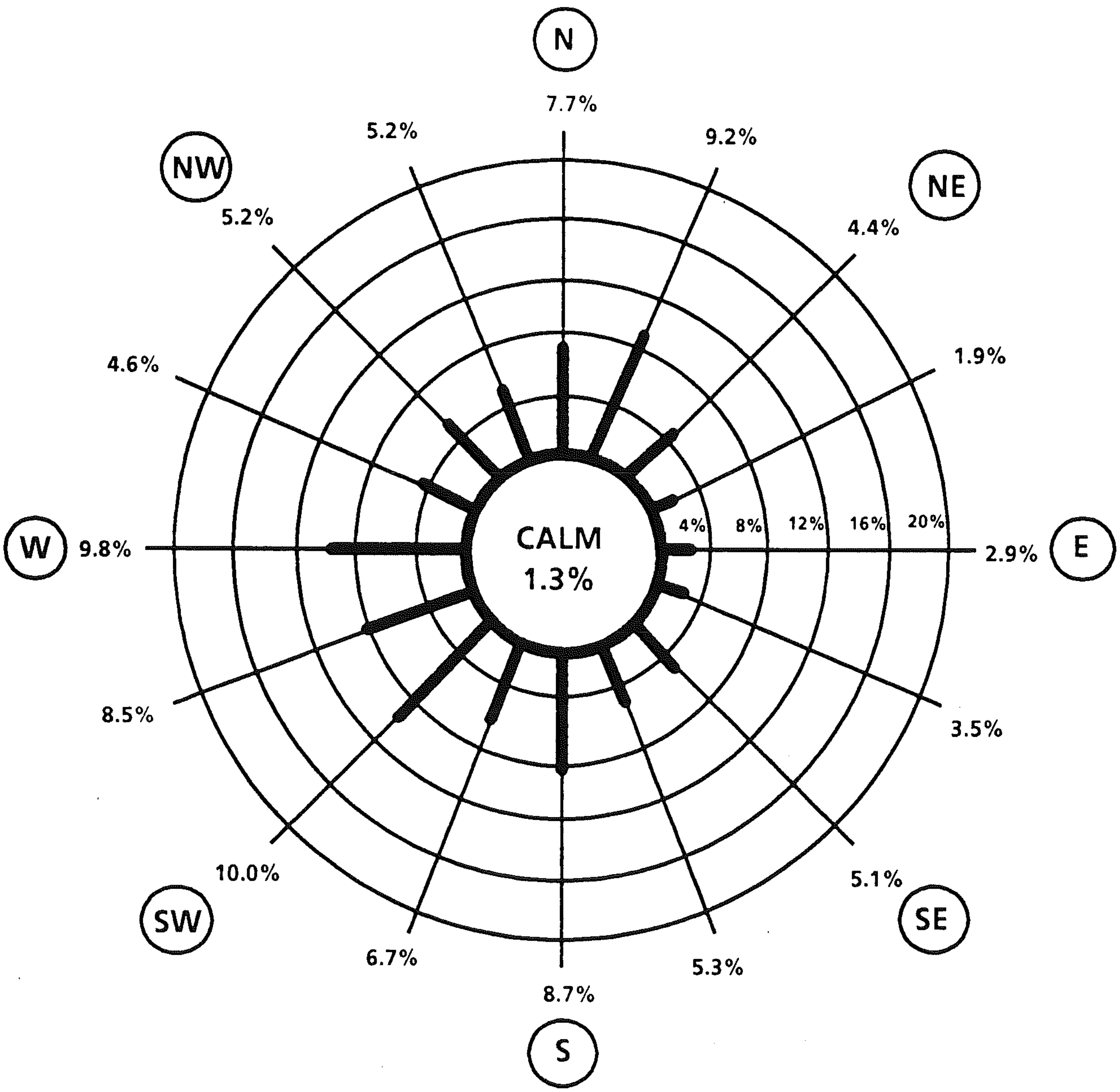
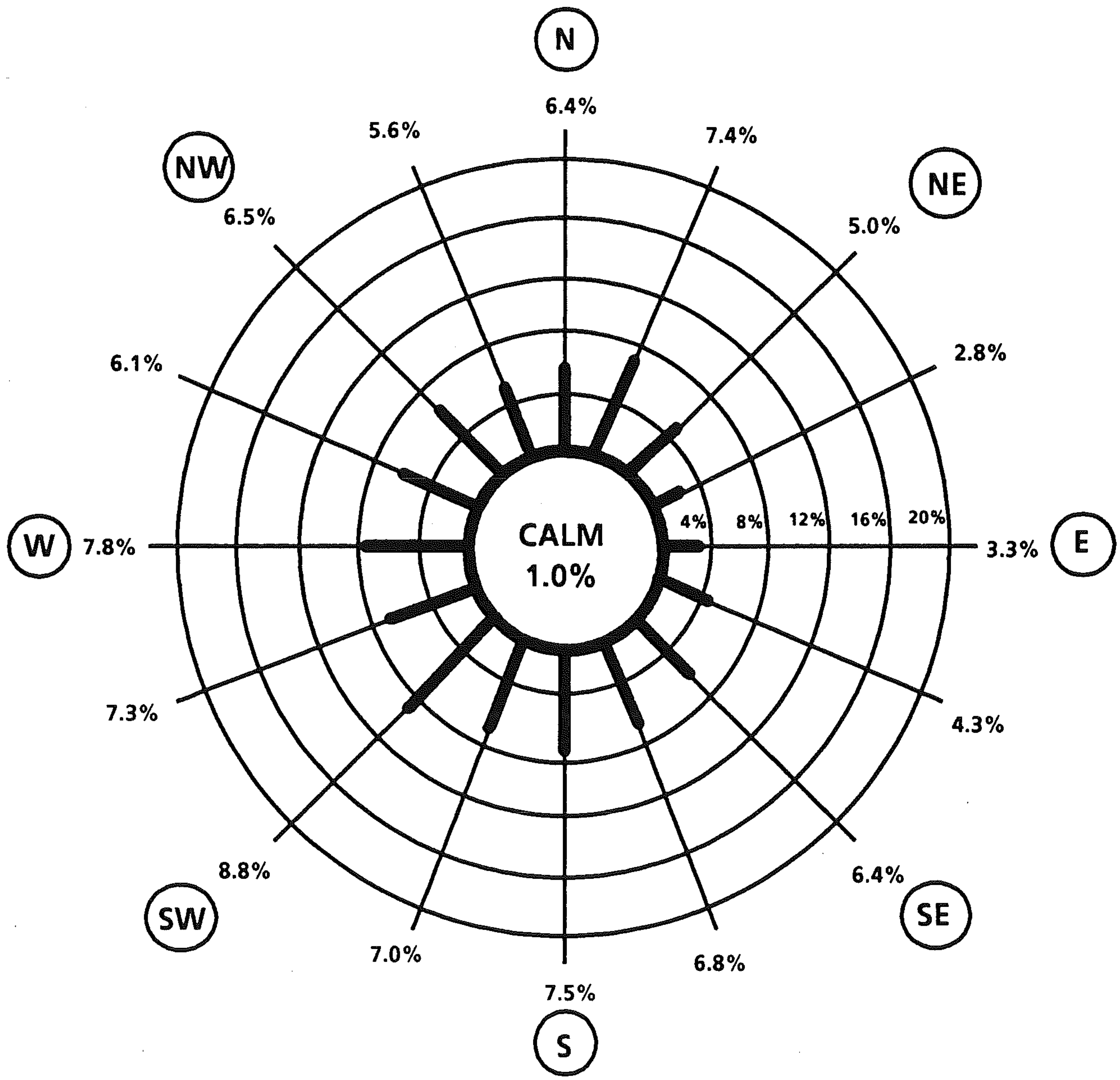


FIGURE 10

WIND ROSE FOR APRIL - SEPTEMBER 1986
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY



V. NITROGEN DIOXIDE

HEALTH EFFECTS

Nitrogen dioxide (NO_2) is a toxic gas with a characteristic pungent odor and a reddish-orange-brown color. It is highly oxidizing and extremely corrosive.

Nitrogen dioxide is not emitted into the atmosphere to any great extent by man-made sources. However, its presence in the atmosphere is accounted for by the photochemical oxidation of nitric oxide (NO), large amounts of which are emitted into the air by high temperature combustion processes. Industrial furnaces, power plants and motor vehicles are the primary sources of nitric oxide emissions.

Exposure to NO_2 is believed to increase the risks of acute respiratory disease and susceptibility to chronic respiratory infection. NO_2 also contributes to heart, lung, liver and kidney damage. At high concentrations, this pollutant can be fatal. At lower levels of 25 to 100 parts per million, it can cause acute bronchitis and pneumonia. Occasional exposure to low levels of NO_2 can irritate the eyes and skin.

Other effects of nitrogen dioxide are its toxicity to vegetation and its ability to combine with water vapor to form nitric acid. Furthermore, NO_2 is an essential ingredient, along with hydrocarbons, in the formation of ozone.

CONCLUSIONS

Nitrogen dioxide (NO_2) concentrations at all monitoring sites did not violate the NAAQS for NO_2 in 1986. The annual arithmetic mean NO_2 concentration at each site was well below the federal standard of 100 $\mu g/m^3$.

SAMPLE COLLECTION AND ANALYSIS

The DEP Air Monitoring Unit used continuous electronic analyzers employing the chemiluminescent reference method to continuously measure NO_2 levels.

DISCUSSION OF DATA

Monitoring Network - There were three nitrogen dioxide monitoring sites in 1986 (see Figure 11). The sites -- Bridgeport 123, East Hartford 003 and New Haven 123 -- were located in three urban areas in order to obtain data alongside ozone monitors.

Precision and Accuracy - Sixty-four precision checks were made on the NO_2 monitors in 1986, yielding 95% probability limits ranging from -11% to +13%. Accuracy is determined by introducing a known amount of NO_2 into each of the monitors. Eight audits for accuracy were conducted on the monitoring network in 1986. Four different concentration levels were tested on each monitor: low, low/medium, medium/high and high. The 95% probability limits for the low level test ranged from -14% to +23%; those for the low/medium level test ranged from -6% to +5%; those for the medium/high level test ranged from -11% to +8%; and those for the high level test ranged from -12% to +6%.

Historical Data - The DEP's historical file of annual average nitrogen dioxide data from gas bubblers for 1973-1980 is available in the 1980 Air Quality Summary. Data from continuous electronic analyzers for the years 1981 through 1983 can be found in the 1983 Air Quality Summary. Data for the years 1984 through 1986 can be found in Table 22 below.

Annual Averages - The annual average NO_2 standard of 100 $\mu g/m^3$ was not exceeded in 1986 at any site in Connecticut (see Table 22). In 1986, all three sites had sufficient data to compute valid arithmetic means. This permits comparisons with the 1984 and 1985 annual averages. Decreases in the annual average NO_2 concentrations are evident at the Bridgeport and New Haven sites between 1984 and 1986.

Statistical Projections - The format of Table 22 is the same as that used to present the TSP and sulfur dioxide data. However, Table 22 gives the annual arithmetic mean of the hourly NO_2 concentrations in order to allow direct comparison to the annual NO_2 standard. The 95% confidence limits about the arithmetic mean for each site demonstrate that it is unlikely that any site exceeded the primary annual standard of 100 $\mu g/m^3$ in 1986.

10-High Days with Wind Data - Table 23 presents for each site the ten days in 1986 when the highest hourly NO_2 readings occurred, along with the associated wind conditions for each day. (See the discussion of Table 11 in the TSP section for a description of the original use of the wind data.)

According to National Weather Service local climatological data recorded at Bradley Airport, 13 of the 21 days listed in the table had more then 50% of the possible sunshine. Of the eight remaining days, four followed days when the percent of possible sunshine exceeded 50%. This is interpreted to confirm the importance of photochemical oxidation in the formation of NO_2.

Seven of the high NO_2 days occurred at 2 or more of the sites, and four of these days had relatively persistent winds out of the southwest quadrant. Such winds were also characteristic of 40% of the days listed in Table 23.

Given the above observations and the fact that two of the three NO_2 sites are located on the coast of Connecticut, it appears that a combination of pollutant transport and a high percent of possible sunshine (both of which occur on days with relatively persistent southwest winds) tend to produce high NO_2 levels in Connecticut.

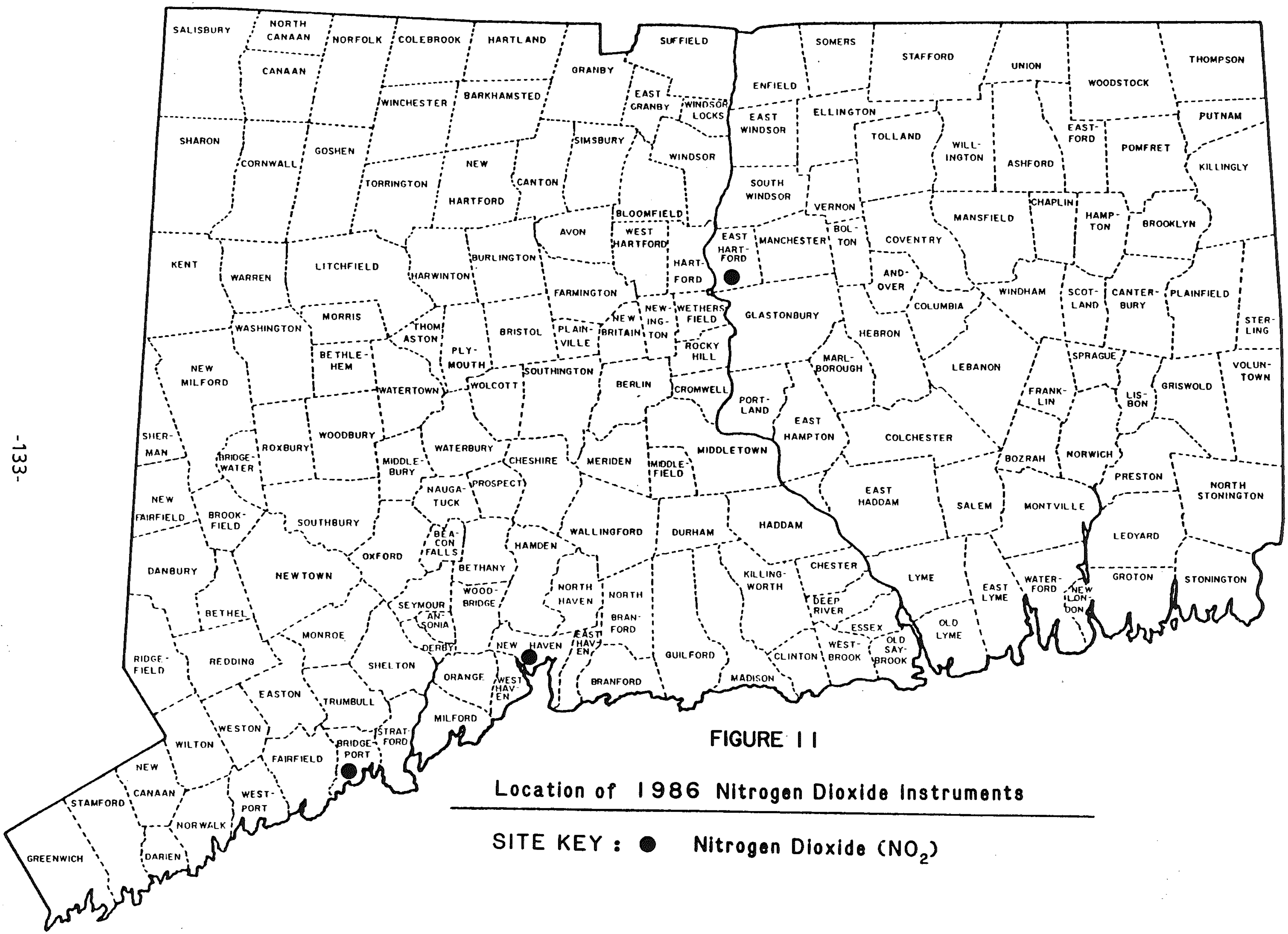


FIGURE 11

Location of 1986 Nitrogen Dioxide Instruments

SITE KEY : ● Nitrogen Dioxide (NO_2)

TABLE 22

1984 -1986 NITROGEN DIOXIDE ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

Town Name	Site	Year	Samples	Arithmetic Mean	95-Percent-Limits Lower	95-Percent-Limits Upper	Standard Deviation
Bridgeport	123	1984	8689	51.5	51.4	51.6	29.7
Bridgeport	123	1985	8602	50.3	50.2	50.4	26.8
Bridgeport	123	1986	8093	49.7	49.6	49.9	26.3
East Hartford	003	1984	8172	39.8	39.6	40.0	26.2
East Hartford	003	1985	8461	39.6	39.5	39.7	23.3
East Hartford	003	1986	8272	40.2	40.1	40.3	23.3
New Haven	123	1984	8530	58.2	58.1	58.3	29.0
New Haven	123	1985	8566	57.6	57.5	57.7	26.6
New Haven	123	1986	8057	54.2	54.0	54.4	26.7

N.B. The arithmetic mean and standard deviation have units of $\mu g/m^3$.

TABLE 23

1986 TEN HIGHEST 1-HOUR AVERAGE NO2 DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BRIDGEPORT-123 (8093)	NO2	0.096	0.095	0.091	0.090	0.088	0.084	0.084	0.083	0.079	0.078
	DATE	10/29/86	9/26/86	10/23/86	10/21/86	1/18/86	5/30/86	1/17/86	5/27/86	10/ 9/86	5/29/86
METEOROLOGICAL SITE	DIR (DEG)	210	220	240	240	210	260	170	240	280	290
NEWARK	VEL (MPH)	9.1	8.2	8.9	8.2	7.1	12.2	0.8	14.5	4.7	8.4
	SPD (MPH)	9.5	8.8	9.6	8.8	10.4	13.4	8.2	15.7	9.5	13.7
	RATIO	0.957	0.934	0.926	0.939	0.691	0.911	0.095	0.927	0.496	0.614
METEOROLOGICAL SITE	DIR (DEG)	210	360	240	230	180	270	190	190	260	260
BRADLEY	VEL (MPH)	8.5	0.7	7.5	4.8	6.4	5.4	4.3	8.0	3.3	6.1
	SPD (MPH)	8.9	5.0	9.6	6.5	6.6	7.9	4.5	9.1	10.2	8.2
	RATIO	0.955	0.134	0.780	0.739	0.971	0.677	0.974	0.888	0.327	0.742
METEOROLOGICAL SITE	DIR (DEG)	230	210	260	250	240	220	100	220	250	240
BRIDGEPORT	VEL (MPH)	7.6	1.6	5.9	5.7	5.6	8.5	0.2	2.8	3.5	7.3
	SPD (MPH)	7.9	4.9	6.3	6.5	6.3	8.8	5.6	7.0	6.8	8.6
	RATIO	0.956	0.326	0.940	0.883	0.888	0.969	0.028	0.401	0.517	0.849
METEOROLOGICAL SITE	DIR (DEG)	250	270	270	250	230	290	220	270	280	290
WORCESTER	VEL (MPH)	10.3	3.5	10.4	9.8	11.0	10.3	11.1	6.0	6.6	8.7
	SPD (MPH)	10.6	5.6	11.4	9.9	11.1	10.6	11.4	6.9	10.9	9.5
	RATIO	0.972	0.621	0.920	0.987	0.993	0.966	0.978	0.863	0.609	0.916
EAST HARTFORD-003 8272 (8072)	NO2	0.123	0.103	0.090	0.088	0.079	0.078	0.075	0.075	0.071	0.068
	DATE	1/13/86	10/21/86	1/17/86	1/26/86	12/10/86	8/19/86	5/ 6/86	1/18/86	5/30/86	5/31/86
METEOROLOGICAL SITE	DIR (DEG)	320	240	170	350	270	30	260	210	260	270
NEWARK	VEL (MPH)	12.8	8.2	0.8	9.1	10.0	5.9	7.1	7.1	12.2	8.3
	SPD (MPH)	15.8	8.8	8.2	10.2	10.8	9.6	14.7	10.4	13.4	12.4
	RATIO	0.811	0.939	0.095	0.893	0.930	0.615	0.487	0.691	0.911	0.668
METEOROLOGICAL SITE	DIR (DEG)	310	230	190	230	310	10	130	180	270	280
BRADLEY	VEL (MPH)	5.6	4.8	4.3	2.9	3.2	7.3	3.5	6.4	5.4	3.0
	SPD (MPH)	7.5	6.5	4.5	7.5	5.5	9.8	6.3	6.6	7.9	6.2
	RATIO	0.746	0.739	0.974	0.388	0.581	0.746	0.557	0.971	0.677	0.484
METEOROLOGICAL SITE	DIR (DEG)	320	250	100	130	280	60	120	240	220	220
BRIDGEPORT	VEL (MPH)	8.8	5.7	0.2	2.3	8.8	2.6	2.5	5.6	8.5	4.6
	SPD (MPH)	11.4	6.5	5.6	7.6	9.6	6.9	10.1	6.3	8.8	7.6
	RATIO	0.771	0.883	0.028	0.298	0.918	0.371	0.247	0.888	0.969	0.601
METEOROLOGICAL SITE	DIR (DEG)	290	250	220	160	290	40	90	230	290	290
WORCESTER	VEL (MPH)	9.4	9.8	11.1	13.1	12.1	6.1	5.4	11.0	10.3	3.6
	SPD (MPH)	10.4	9.9	11.4	14.4	12.8	6.8	5.6	11.1	10.6	8.2
	RATIO	0.909	0.987	0.978	0.914	0.947	0.903	0.957	0.993	0.966	0.440
NEW HAVEN-123 (8057)	NO2	0.319	0.108	0.100	0.097	0.092	0.090	0.089	0.089	0.088	0.087
	DATE	11/ 7/86	5/ 6/86	1/ 2/86	1/18/86	12/ 6/86	1/29/86	1/17/86	1/13/86	5/ 5/86	10/23/86
METEOROLOGICAL SITE	DIR (DEG)	40	260	220	210	230	320	170	320	230	240
NEWARK	VEL (MPH)	4.7	7.1	5.6	7.1	9.9	2.4	0.8	12.8	18.0	8.9
	SPD (MPH)	6.8	14.7	7.3	10.4	10.9	10.2	8.2	15.8	18.4	9.6
	RATIO	0.702	0.487	0.765	0.691	0.906	0.235	0.095	0.811	0.978	0.926
METEOROLOGICAL SITE	DIR (DEG)	360	130	210	180	210	190	190	310	230	240
BRADLEY	VEL (MPH)	2.1	3.5	7.3	6.4	6.0	2.9	4.3	5.6	5.0	7.5
	SPD (MPH)	4.6	6.3	8.1	6.6	6.6	6.2	4.5	7.5	7.0	9.6
	RATIO	0.455	0.557	0.901	0.971	0.915	0.477	0.974	0.746	0.715	0.780

TABLE 23, CONTINUED

1986 TEN HIGHEST 1-HOUR AVERAGE NO2 DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	90	120	250	240	260	290	100	320	240	260
BRIDGEPORT	VEL (MPH)	4.4	2.5	4.7	5.6	11.5	3.6	0.2	8.8	9.2	5.9
	SPD (MPH)	5.6	10.1	4.9	6.3	11.8	7.6	5.6	11.4	9.5	6.3
	RATIO	0.792	0.247	0.963	0.888	0.978	0.468	0.028	0.771	0.970	0.940
METEOROLOGICAL SITE	DIR (DEG)	250	90	230	230	260	250	220	290	240	270
WORCESTER	VEL (MPH)	2.4	5.4	9.4	11.0	10.6	6.6	11.1	9.4	6.1	10.4
	SPD (MPH)	3.2	5.6	9.6	11.1	11.5	7.3	11.4	10.4	9.6	11.4
	RATIO	0.767	0.957	0.978	0.993	0.923	0.904	0.978	0.909	0.635	0.920

VI. CARBON MONOXIDE

HEALTH EFFECTS

Carbon monoxide (CO) is a colorless, odorless, poison gas formed when carbon-containing fuel is not burned completely. It is by far the most plentiful air pollutant. Fortunately, this deadly gas does not persist in the atmosphere. It is apparently converted by natural processes to harmless carbon dioxide in ways not yet understood, and this is done quickly enough to prevent any general buildup. However, CO can reach dangerous levels in local areas, such as city-street canyons with heavy auto traffic and little wind.

Clinical experience with accidental CO poisoning has shown clearly how it affects the body. When the gas is breathed, CO replaces oxygen in the red blood cells, reducing the amount of oxygen that can reach the body cells and maintain life. Lack of oxygen affects the brain, and the first symptoms are impaired perception and thinking. Reflexes are slowed, judgement weakened, and drowsiness ensues. An auto driver breathing high levels of CO is more likely to have an accident; an athlete's performance and skill drop suddenly. Lack of oxygen then affects the heart. Death can come from heart failure or general asphyxiation, if a person is exposed to very high levels of CO.

CONCLUSIONS

The eight-hour National Ambient Air Quality Standard of 9 parts per million (ppm) was exceeded at two of the five carbon monoxide monitoring sites in Connecticut during 1986. The standard was exceeded three times at Hartford 017 and once at Stamford 020. No exceedance of the 35 ppm one-hour standard was measured at any site in 1986.

In order to put the monitoring data into proper perspective, it must be realized that carbon monoxide concentrations vary greatly from place-to-place. More than 95% of the CO emissions in Connecticut come from motor vehicles. Therefore, concentrations are greatest in areas of traffic congestion. The magnitude and frequency of high concentrations observed at any monitoring site are not necessarily indicative of widespread CO levels.

The CO standards are likely to be exceeded in any city in the state where there are areas of traffic congestion. However, as Connecticut's SIP control strategies are implemented, there should continue to be a decrease in the number of congested areas. Also, as federally - mandated controls which reduce emissions from new motor vehicles are implemented, a reduction in ambient CO levels should be achieved.

Unlike SO_2, TSP and O_3, elevated CO levels are not often associated with southwesterly winds, indicating that this pollutant is more of a local-scale (not regional-scale) problem.

METHOD OF MEASUREMENT

The DEP Air Monitoring Unit uses instruments employing a non-dispersive infrared technique to continuously measure carbon monoxide levels. The instantaneous concentrations are recorded on strip charts from which hourly averages are extracted. Due to the relative inertness of CO, a long sampling line can be used without the danger of CO being depleted by chemical reactions within the lines. The most important consideration in the measurement of CO is the placement of the sampling probe inlet; that is, its proximity to traffic lanes.

DISCUSSION OF DATA

Monitoring Network - The network in 1986 consisted of five carbon monoxide monitors: Bridgeport 004, Hartford 017, New Britain 002, New Haven 019, and Stamford 020. They are all located in urban areas. All the sites are located west of the Connecticut River, with three of them in coastal towns (see Figure 12). New Haven 019 is a new site, and it operated in the last nine months of 1986. It replaces the New Haven 007 site. Hartford 017 is a relatively new site and has been in existence for three years.

Precision and Accuracy - The carbon monoxide monitors had a total of 134 precision checks during 1986. The resulting 95% probability limits were -8% to +5%. Accuracy is determined by introducing a known amount of CO into each of the monitors. Eight audits for accuracy were conducted on the monitoring network in 1986. Three different concentration levels were tested on each monitor: low, medium and high. The 95% probability limits ranged from +2% to +9% for the low level test; 0% to +5% for the medium level test; and -1% to +5% for the high level test.

8-Hour and 1-Hour Averages - Hartford 017 had a second high CO concentration exceeding the 8-hour standard of 9 ppm, which means that the standard was violated at this site in 1986 (see Table 24). This was also the case in 1985. Regarding the maximum 8-hour running average at each site, there were decreases from 1985 to 1986 at Bridgeport and Hartford. Increases occurred at New Britain and Stamford. The second highest 8-hour running average increased from 1985 to 1986 at Bridgeport and New Britain and decreased at Hartford and Stamford.

As for 1-hour averages, no site in the state recorded a value exceeding the primary 1-hour standard of 35 ppm. Only New Britain 002 recorded a maximum 1-hour value greater than the year before. Second high 1-hour values were higher in 1986 at New Britain and Stamford.

The maximum and second high CO concentrations at each site are presented in Table 24. Table 25 presents monthly highs and a monthly tally of the number of times the standards were exceeded at each site. Seasonal variations in CO levels can be observed using this table.

10-High Days with Wind Data - Table 26 lists for each site the ten days in 1986 when the 1-hour CO averages were highest. The wind data associated with these high readings are also presented. (See the discussion of Table 11 in the TSP section for a description of the origin and use of these wind data.)

The high CO levels tended to occur during the colder months at all five CO sites. Low atmospheric mixing heights and stable atmospheric conditions are two reasons CO levels are high during the fall and winter. Also, cold starts and warmups (rich mixtures) contribute to an increase in CO. A noteworthy feature of the high CO days is that the persistence of a wind is more important than the direction to which or from which it is blowing. Since 95% of the CO emissions in Connecticut come from motor vehicles, it is likely that the high CO levels are caused when relatively persistent winds are blowing CO emissions from the direction of nearby roads toward the monitors.

Trends - Due to the local nature of CO emissions, it is not appropriate to give an estimate of widespread CO trends. However, local CO trends can be addressed in a number of ways. Exceedances of the 8-hour standard can be tracked in order to determine if a CO problem is worsening or abating at a site. This is illustrated in Table 26a and in Figure 13. One can see that over the past five years the number of exceedances remained low and relatively unchanged at the Bridgeport, New Britain and Stamford sites. The Hartford-017 site has been in existence for only three years. It has shown a higher frequency of exceedances relative to the other sites, and this frequency has steadily decreased. Since the New Haven 019 site has been operating for less than a year, nothing can be said about the trend at this site. Therefore, it is included in Table 26a but not in Figure 13.

Another way of illustrating local CO trends is to use running averages. Running averages have the advantage of smoothing out the abrupt, transitory changes in pollutant levels that are often evident in consecutive sampling periods and from one season to the next. Figure 14 shows the 36-month running average of the hourly CO concentrations at Bridgeport, New Britain and Stamford. The Hartford 017 and the New Haven 019 sites are not included because they lack sufficient data. CO levels seem to be trending downward at all three sites.

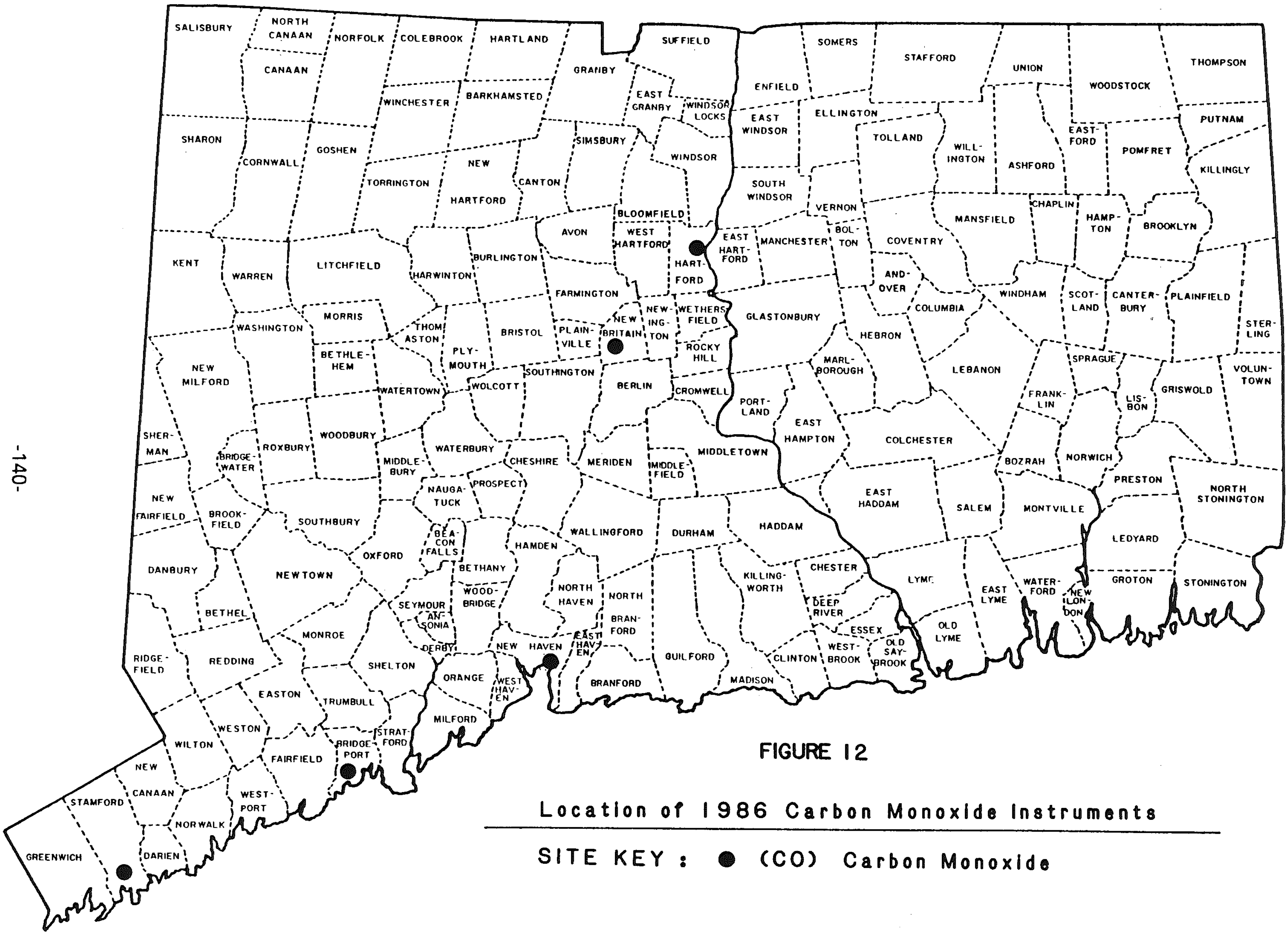


FIGURE 12

Location of 1986 Carbon Monoxide Instruments

SITE KEY : ● (CO) Carbon Monoxide

TABLE 24

1986 CARBON MONOXIDE STANDARDS ASSESSMENT SUMMARY

TOWN-SITE	MAXIMUM 8-HOUR RUNNING AVERAGE	TIME OF MAXIMUM 8-HOUR RUNNING AVERAGE[1]	2ND HIGH 8-HOUR RUNNING AVERAGE	TIME OF 2ND HIGH 8-HOUR RUNNING AVERAGE[1]	MAXIMUM 1-HOUR AVERAGE	TIME OF MAXIMUM 1-HOUR AVERAGE[2]	2ND HIGH 1-HOUR AVERAGE	TIME OF ~~MAXIMUM~~ 2nd High 1-HOUR AVERAGE[2]
Bridgeport-004	7.9	1/3/1	7.7	11/29/2	11.5	11/28/22	11.0	1/2/20
Hartford-017	11.0	1/17/19	10.9	1/13/14	19.0	1/17/18	16.3	1/17/17
New Britain-002[3]	7.1	1/13/15	6.7	1/17/11	13.4	1/17/9	11.5	1/13/10
New Haven-019[4]	7.9	11/29/1	7.1	12/10/16	11.9	12/10/10	11.6	11/8/19
Stamford-020	10.9	1/2/24	7.7	1/19/1	16.4	1/2/18	15.6	1/2/19

[1] The time of the 8-hour average is reported as follows: month/day/hour (EST), specifying the end of the 8-hour period.
[2] The time of the 1-hour average is reported as follows: month/day/hour (EST), specifying the end of the 1-hour period.
[3] The site did not operate in November or December.
[4] The site did not operate from January through March.

N.B. The CO averages are expressed in terms of parts per million (ppm).

TABLE 25

1986 CARBON MONOXIDE SEASONAL FEATURES

TOWN-SITE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Bridgeport-004	Max. 1-Hour	11.0	6.5	6.1	4.6	3.6	3.6	3.5	3.9	5.0	6.3	11.5	8.2
	Max. Running 8-Hour	7.9	4.5	4.0	2.9	2.2	2.7	2.8	2.6	3.2	3.2	7.7	3.8
	No. of 8-Hour Exceedances	0	0	0	0	0	0	0	0	0	0	0	0
Hartford-017	Max. 1-Hour	19.0	12.8	12.0	11.3	8.7	11.3	6.7	7.6	8.7	11.0	12.1	14.7
	Max. Running 8-Hour	11.0	8.1	7.2	6.8	6.7	5.9	4.5	5.2	7.3	6.1	8.5	10.9
	No. of 8-Hour Exceedances	2	0	0	0	0	0	0	0	0	0	0	1
New Britain-002	Max. 1-Hour	13.4	10.3	9.0	5.4	4.8	5.3	6.4	5.0	6.0	6.9	-	-
	Max. Running 8-Hour	7.1	6.4	5.5	3.4	3.8	3.9	4.4	4.1	4.5	4.2	-	-
	No. of 8-Hour Exceedances	0	0	0	0	0	0	0	0	0	0	-	-
New Haven-019	Max. 1-Hour	-	-	-	5.1	7.9	10.0	5.2	5.7	6.7	8.0	11.6	11.9
	Max. Running 8-Hour	-	-	-	4.0	5.2	5.2	3.8	3.8	4.4	5.1	7.9	7.1
	No. of 8-Hour Exceedances	-	-	-	0	0	0	0	0	0	0	0	0
Stamford-020	Max. 1-Hour	16.4	8.1	7.3	12.3	4.9	4.5	4.5	6.0	6.9	8.3	10.9	13.6
	Max. Running 8-Hour	10.9	5.5	4.2	3.5	4.2	3.9	3.8	3.6	5.4	4.4	7.4	7.4
	No. of 8-Hour Exceedances	1	0	0	0	0	0	0	0	0	0	0	0

N.B. The CO concentrations are in terms of parts per million (ppm).

TABLE 26

1986 TEN HIGHEST 1-HOUR AVERAGE CO DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BRIDGEPORT-004 (8263)	CO	11.5	11.0	10.0	9.1	8.5	8.2	8.2	7.8	7.6	7.2
	DATE	11/28/86	1/ 2/86	1/11/86	11/25/86	1/17/86	12/23/86	1/16/86	1/12/86	1/18/86	11/26/86
METEOROLOGICAL SITE	DIR (DEG)	240	220	340	270	170	230	220	200	210	180
NEWARK	VEL (MPH)	4.7	5.6	8.7	5.1	0.8	8.4	7.6	13.3	7.1	5.7
	SPD (MPH)	6.2	7.3	10.9	6.5	8.2	9.9	9.6	13.5	10.4	7.8
	RATIO	0.760	0.765	0.793	0.785	0.095	0.847	0.789	0.985	0.691	0.731
METEOROLOGICAL SITE	DIR (DEG)	190	210	340	310	190	240	170	200	180	190
BRADLEY	VEL (MPH)	4.7	7.3	3.4	5.3	4.3	4.6	1.0	11.5	6.4	1.2
	SPD (MPH)	5.3	8.1	7.9	6.0	4.5	8.1	2.6	11.8	6.6	5.3
	RATIO	0.882	0.901	0.424	0.886	0.974	0.571	0.384	0.978	0.971	0.222
METEOROLOGICAL SITE	DIR (DEG)	260	250	340	260	100	260	230	220	240	200
BRIDGEPORT	VEL (MPH)	3.8	4.7	5.4	5.4	0.2	7.9	2.9	11.4	5.6	4.7
	SPD (MPH)	4.6	4.9	5.6	6.5	5.6	8.6	4.7	11.8	6.3	9.6
	RATIO	0.833	0.963	0.965	0.836	0.028	0.912	0.614	0.968	0.888	0.488
METEOROLOGICAL SITE	DIR (DEG)	260	230	320	300	220	280	270	220	230	210
WORCESTER	VEL (MPH)	9.2	9.4	5.1	5.9	11.1	11.4	8.3	16.3	11.0	9.2
	SPD (MPH)	9.5	9.6	7.5	6.6	11.4	11.8	8.5	16.4	11.1	10.5
	RATIO	0.969	0.978	0.687	0.895	0.978	0.963	0.977	0.993	0.993	0.876
HARTFORD-017 (7845)	CO	19.0	14.7	14.4	13.8	13.7	13.3	13.1	12.8	12.7	12.7
	DATE	1/17/86	12/10/86	1/23/86	12/17/86	1/ 3/86	1/13/86	1/27/86	2/ 3/86	2/ 5/86	1/10/86
METEOROLOGICAL SITE	DIR (DEG)	170	270	360	70	290	320	320	340	280	260
NEWARK	VEL (MPH)	0.8	10.0	14.7	4.7	4.5	12.8	14.1	7.9	4.5	9.0
	SPD (MPH)	8.2	10.8	16.0	7.3	7.8	15.8	15.8	10.4	11.2	9.9
	RATIO	0.095	0.930	0.920	0.644	0.580	0.811	0.893	0.759	0.402	0.911
METEOROLOGICAL SITE	DIR (DEG)	190	310	340	10	10	310	300	10	10	250
BRADLEY	VEL (MPH)	4.3	3.2	8.1	2.9	3.7	5.6	5.2	3.7	4.1	6.4
	SPD (MPH)	4.5	5.5	9.5	3.0	5.0	7.5	6.8	5.3	5.3	8.8
	RATIO	0.974	0.581	0.852	0.970	0.727	0.746	0.769	0.696	0.774	0.734
METEOROLOGICAL SITE	DIR (DEG)	100	280	340	90	270	320	310	340	270	260
BRIDGEPORT	VEL (MPH)	0.2	8.8	8.9	7.5	3.1	8.8	7.3	8.3	5.8	11.7
	SPD (MPH)	5.6	9.6	9.2	8.8	7.2	11.4	10.9	8.6	6.3	12.4
	RATIO	0.028	0.918	0.967	0.857	0.429	0.771	0.672	0.961	0.913	0.944
METEOROLOGICAL SITE	DIR (DEG)	220	290	300	70	290	290	200	310	320	260
WORCESTER	VEL (MPH)	11.1	12.1	7.0	3.5	5.2	9.4	4.3	6.6	5.6	12.9
	SPD (MPH)	11.4	12.8	8.5	3.7	7.6	10.4	9.1	7.3	7.3	13.5
	RATIO	0.978	0.947	0.826	0.942	0.680	0.909	0.472	0.899	0.768	0.956
NEW BRITAIN-002 (7012)	CO	13.4	11.5	10.3	9.4	9.4	9.2	9.0	8.3	8.1	7.5
	DATE	1/17/86	1/13/86	2/21/86	2/18/86	2/ 5/86	2/20/86	3/ 4/86	1/ 3/86	2/ 3/86	2/27/86
METEOROLOGICAL SITE	DIR (DEG)	170	320	30	30	280	50	180	290	340	360
NEWARK	VEL (MPH)	0.8	12.8	6.6	11.2	4.5	9.2	4.1	4.5	7.9	10.2
	SPD (MPH)	8.2	15.8	10.2	11.4	11.2	10.5	6.6	7.8	10.4	12.7
	RATIO	0.095	0.811	0.648	0.987	0.402	0.877	0.614	0.580	0.759	0.808
METEOROLOGICAL SITE	DIR (DEG)	190	310	10	10	10	40	220	10	10	310
BRADLEY	VEL (MPH)	4.3	5.6	4.3	7.5	4.1	6.7	4.0	3.7	3.7	6.6
	SPD (MPH)	4.5	7.5	6.3	7.6	5.3	7.5	6.2	5.0	5.3	8.3
	RATIO	0.974	0.746	0.685	0.983	0.774	0.890	0.646	0.727	0.696	0.787

TABLE 26, CONTNUED

1986 TEN HIGHEST 1-HOUR AVERAGE CO DAYS WITH WIND DATA

UNITS : PARTS PER MILLION

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	100	320	30	40	270	50	90	270	340	340
BRIDGEPORT	VEL (MPH)	0.2	8.8	5.4	10.8	5.8	7.9	3.2	3.1	8.3	4.2
	SPD (MPH)	5.6	11.4	9.5	10.8	6.3	8.3	3.6	7.2	8.6	7.0
	RATIO	0.028	0.771	0.564	0.998	0.913	0.950	0.904	0.429	0.961	0.601
METEOROLOGICAL SITE	DIR (DEG)	220	290	30	30	320	40	220	290	310	280
WORCESTER	VEL (MPH)	11.1	9.4	4.4	5.4	5.6	3.0	4.4	5.2	6.6	9.7
	SPD (MPH)	11.4	10.4	8.5	5.6	7.3	3.2	5.5	7.6	7.3	10.1
	RATIO	0.978	0.909	0.514	0.958	0.768	0.948	0.801	0.680	0.899	0.964
NEW HAVEN-019 (5823)	CO	11.9	11.6	10.9	10.1	10.0	9.2	8.4	8.3	8.1	8.0
	DATE	12/10/86	11/ 8/86	12/22/86	12/15/86	6/23/86	11/28/86	12/23/86	11/25/86	12/16/86	10/14/86
METEOROLOGICAL SITE	DIR (DEG)	270	120	270	240	270	240	230	270	210	240
NEWARK	VEL (MPH)	10.0	2.9	6.8	8.6	12.5	4.7	8.4	5.1	5.5	5.5
	SPD (MPH)	10.8	6.5	8.1	9.1	16.2	6.2	9.9	6.5	6.6	8.2
	RATIO	0.930	0.449	0.845	0.947	0.768	0.760	0.847	0.785	0.825	0.674
METEOROLOGICAL SITE	DIR (DEG)	310	360	210	260	250	190	240	310	210	220
BRADLEY	VEL (MPH)	3.2	4.0	5.1	8.4	6.3	4.7	4.6	5.3	1.8	5.2
	SPD (MPH)	5.5	4.3	5.5	11.2	9.3	5.3	8.1	6.0	3.4	7.8
	RATIO	0.581	0.919	0.935	0.752	0.676	0.882	0.571	0.886	0.522	0.669
METEOROLOGICAL SITE	DIR (DEG)	280	100	250	280	270	260	260	260	260	240
BRIDGEPORT	VEL (MPH)	8.8	2.6	7.5	6.7	6.8	3.8	7.9	5.4	0.6	3.8
	SPD (MPH)	9.6	5.0	7.8	7.5	9.2	4.6	8.6	6.5	3.3	5.2
	RATIO	0.918	0.524	0.962	0.899	0.744	0.833	0.912	0.836	0.184	0.726
METEOROLOGICAL SITE	DIR (DEG)	290	130	270	280	270	260	280	300	160	250
WORCESTER	VEL (MPH)	12.1	3.3	8.7	8.1	10.2	9.2	11.4	5.9	1.2	5.9
	SPD (MPH)	12.8	3.4	9.1	8.9	10.8	9.5	11.8	6.6	3.4	7.6
	RATIO	0.947	0.947	0.963	0.906	0.949	0.969	0.963	0.895	0.346	0.775
STAMFORD-020 (8681)	CO	16.4	15.1	14.0	13.6	12.3	11.1	10.9	9.2	9.1	9.0
	DATE	1/ 2/86	1/18/86	1/13/86	12/23/86	4/ 4/86	1/17/86	11/25/86	11/12/86	1/ 3/86	1/16/86
METEOROLOGICAL SITE	DIR (DEG)	220	210	320	230	140	170	270	20	290	220
NEWARK	VEL (MPH)	5.6	7.1	12.8	8.4	6.3	0.8	5.1	2.4	4.5	7.6
	SPD (MPH)	7.3	10.4	15.8	9.9	10.5	8.2	6.5	5.2	7.8	9.6
	RATIO	0.765	0.691	0.811	0.847	0.603	0.095	0.785	0.469	0.580	0.789
METEOROLOGICAL SITE	DIR (DEG)	210	180	310	240	200	190	310	280	10	170
BRADLEY	VEL (MPH)	7.3	6.4	5.6	4.6	4.8	4.3	5.3	1.2	3.7	1.0
	SPD (MPH)	8.1	6.6	7.5	8.1	7.0	4.5	6.0	2.7	5.0	2.6
	RATIO	0.901	0.971	0.746	0.571	0.681	0.974	0.886	0.454	0.727	0.384
METEOROLOGICAL SITE	DIR (DEG)	250	240	320	260	110	100	260	300	270	230
BRIDGEPORT	VEL (MPH)	4.7	5.6	8.8	7.9	3.8	0.2	5.4	1.6	3.1	2.9
	SPD (MPH)	4.9	6.3	11.4	8.6	5.8	5.6	6.5	3.9	7.2	4.7
	RATIO	0.963	0.888	0.771	0.912	0.653	0.028	0.836	0.423	0.429	0.614
METEOROLOGICAL SITE	DIR (DEG)	230	230	290	280	280	220	300	290	290	270
WORCESTER	VEL (MPH)	9.4	11.0	9.4	11.4	7.3	11.1	5.9	3.2	5.2	8.3
	SPD (MPH)	9.6	11.1	10.4	11.8	9.1	11.4	6.6	5.0	7.6	8.5
	RATIO	0.978	0.993	0.909	0.963	0.808	0.978	0.895	0.643	0.680	0.977

TABLE 26a

EXCEEDANCES OF THE 8-HOUR CO STANDARD FOR 1982 -1986

SITE	1982	1983	1984	1985	1986
Bridgeport-004	0	1	0	0	0
Hartford-017	-	-	7	5	3
New Britain-002	2	2	0	0	0[a]
New Haven-019	-	-	-	-	0[b]
Stamford-020	2	1	2	1	1

[a] Data is missing for November and December.
[b] Data is missing for January through March.

FIGURE 13

EXCEEDANCES OF THE 8-HOUR CO STANDARD FOR 1982-1986

SITE: BRIDGEPORT-004

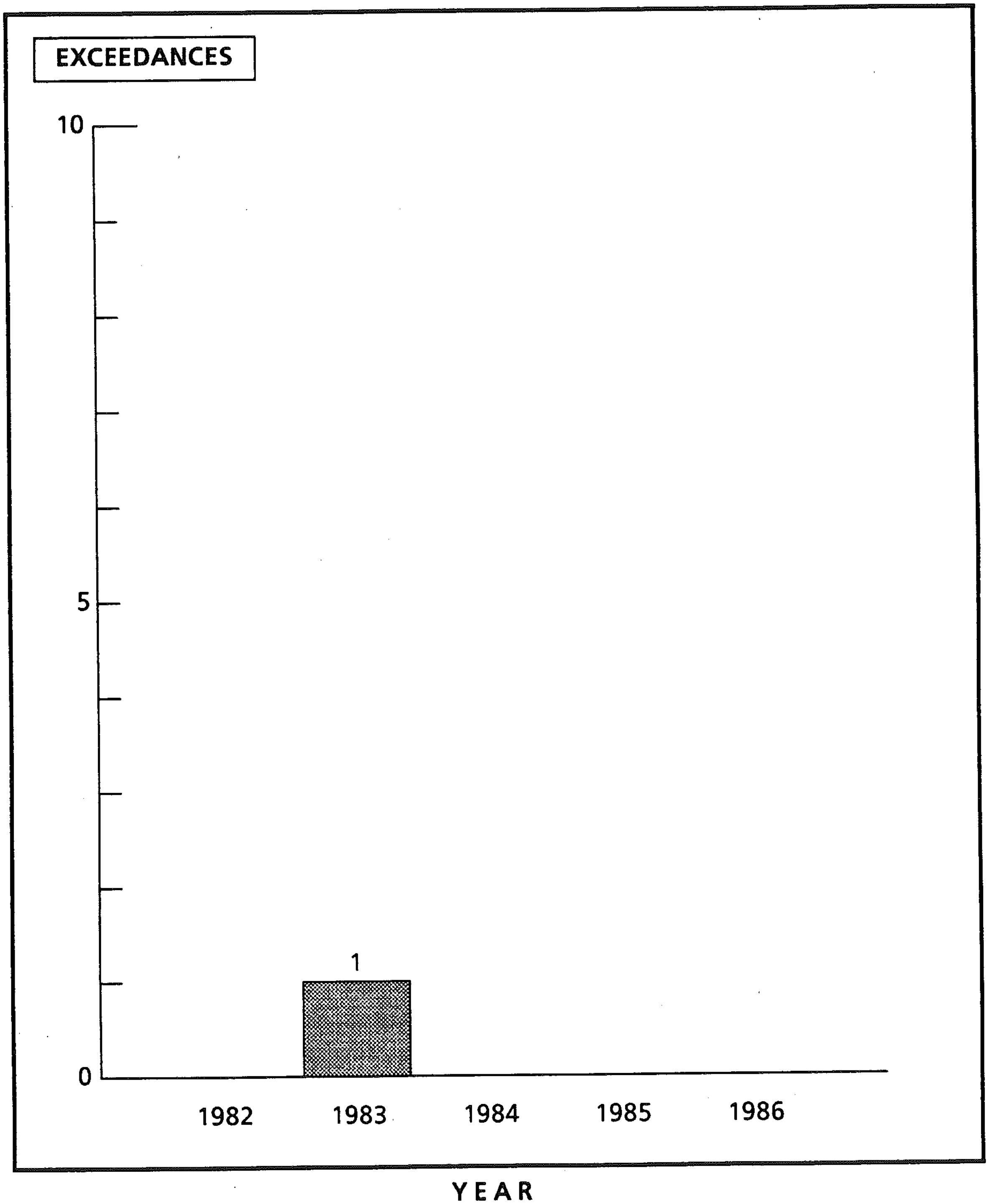


FIGURE 13, CONTINUED

EXCEEDANCES OF THE 8-HOUR CO STANDARD FOR 1982-1986

SITE: HARTFORD-017

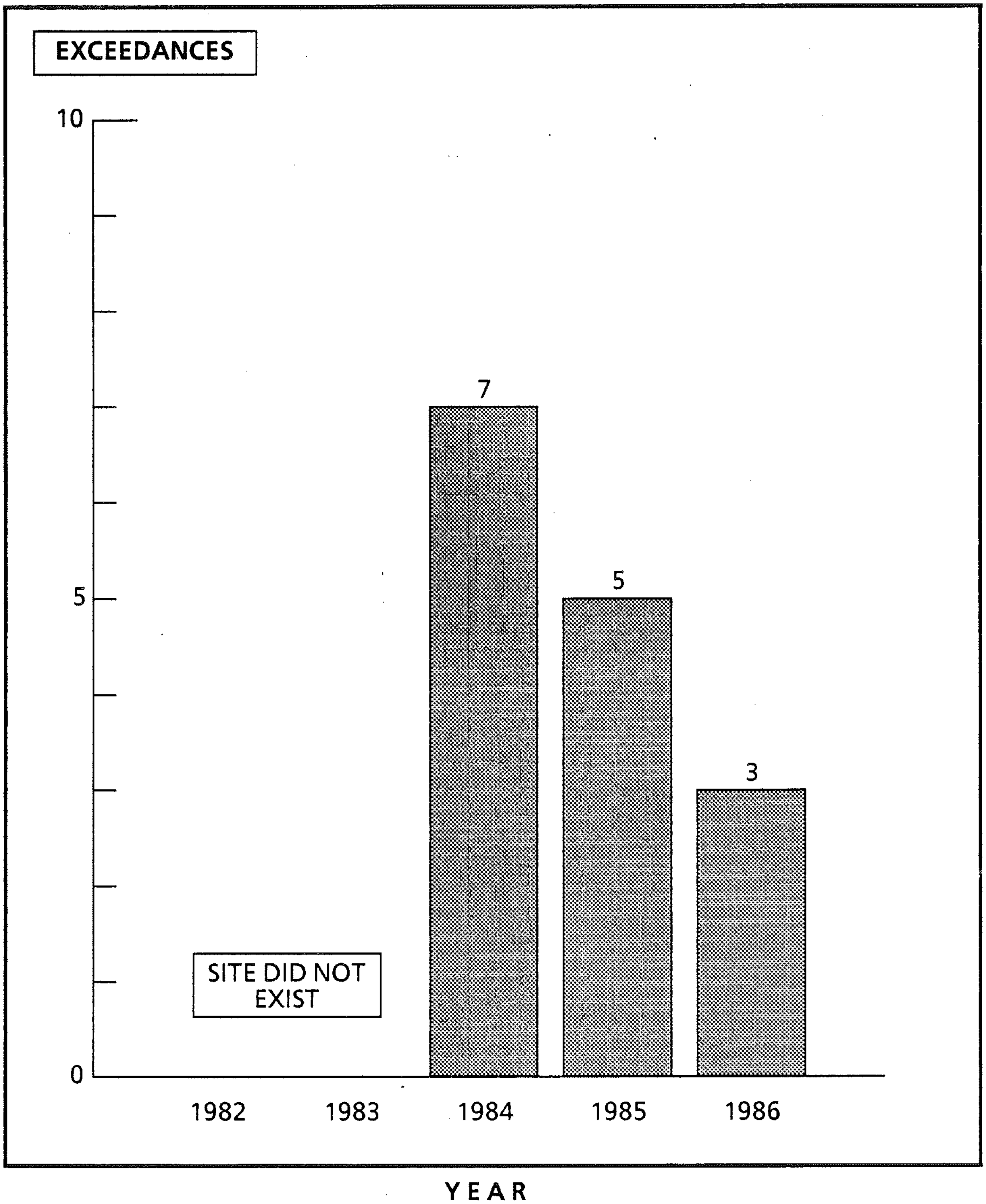


FIGURE 13, CONTINUED

EXCEEDANCES OF THE 8-HOUR CO STANDARD FOR 1982-1986

SITE: NEW BRITAIN-002

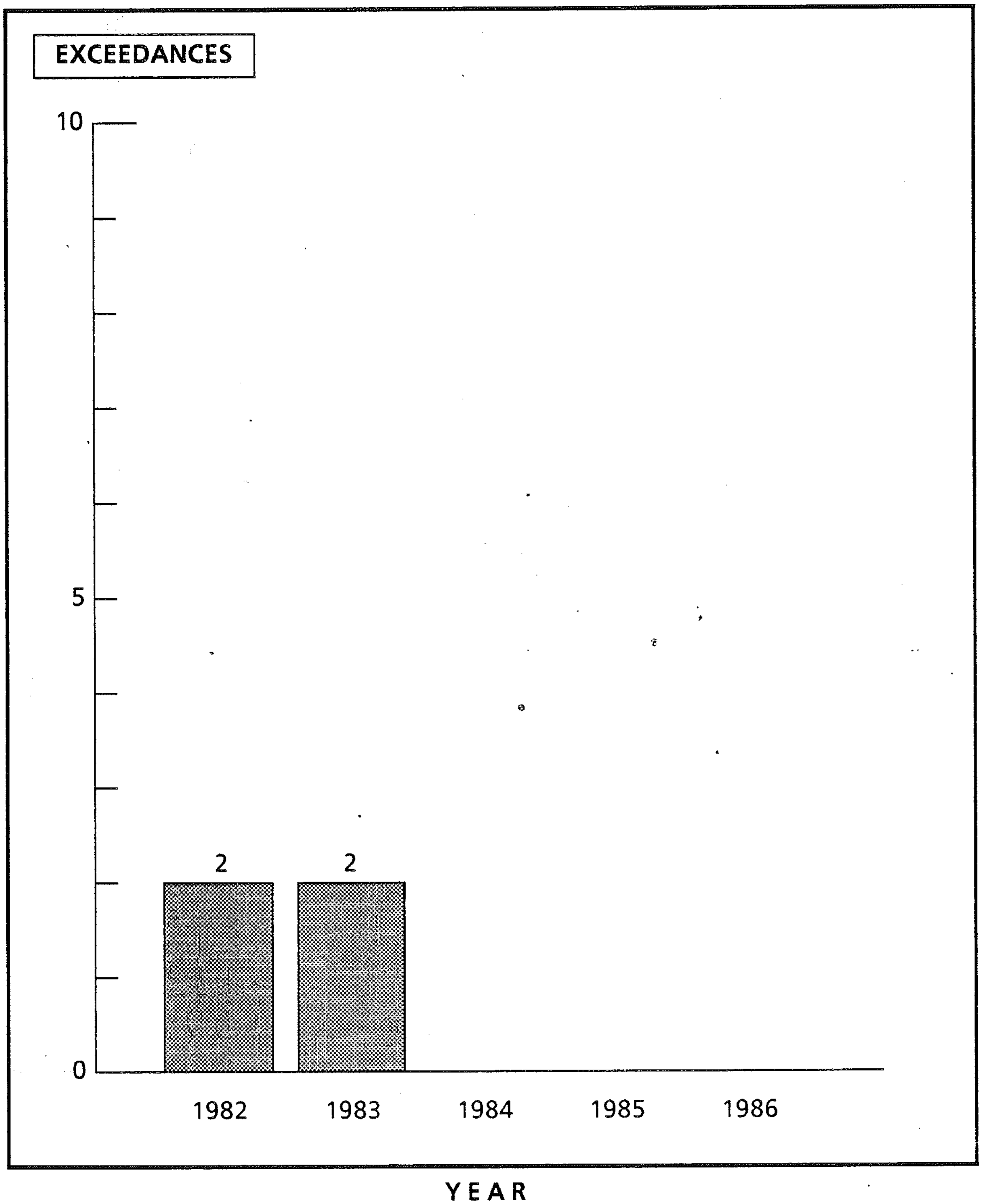


FIGURE 13, CONTINUED

EXCEEDANCES OF THE 8-HOUR CO STANDARD FOR 1982-1986

SITE: STAMFORD-020

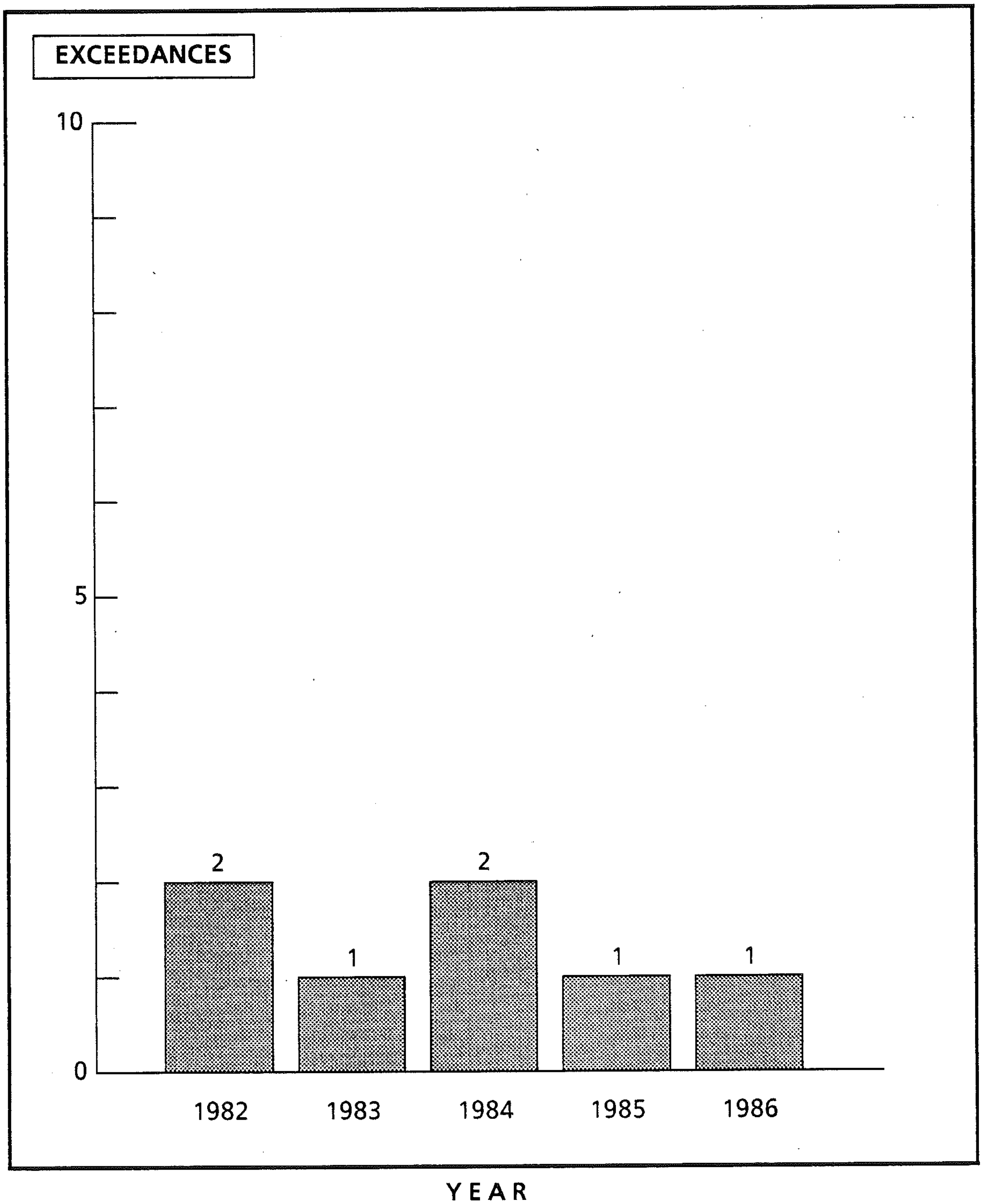


FIGURE 14

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: BRIDGEPORT-004

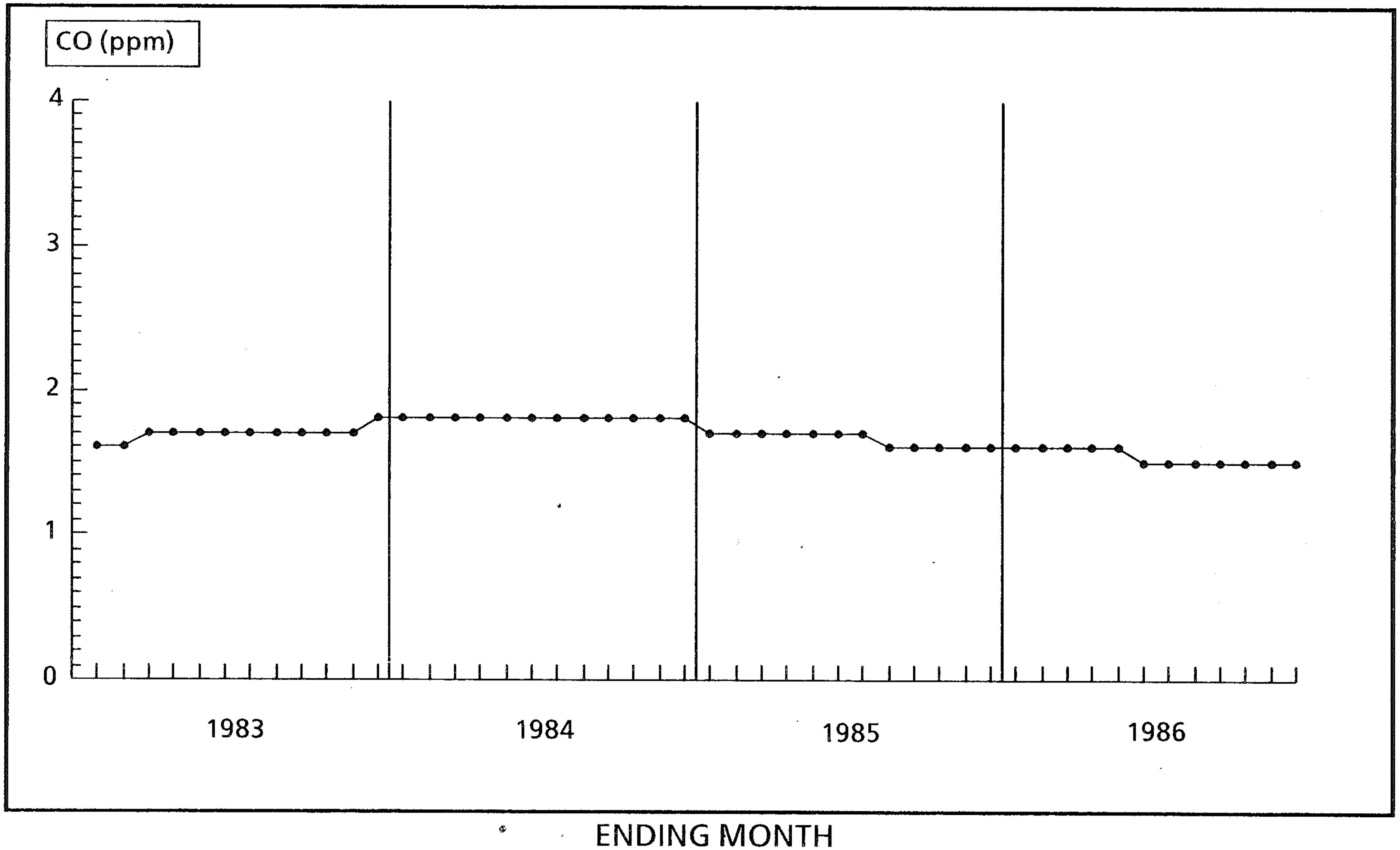
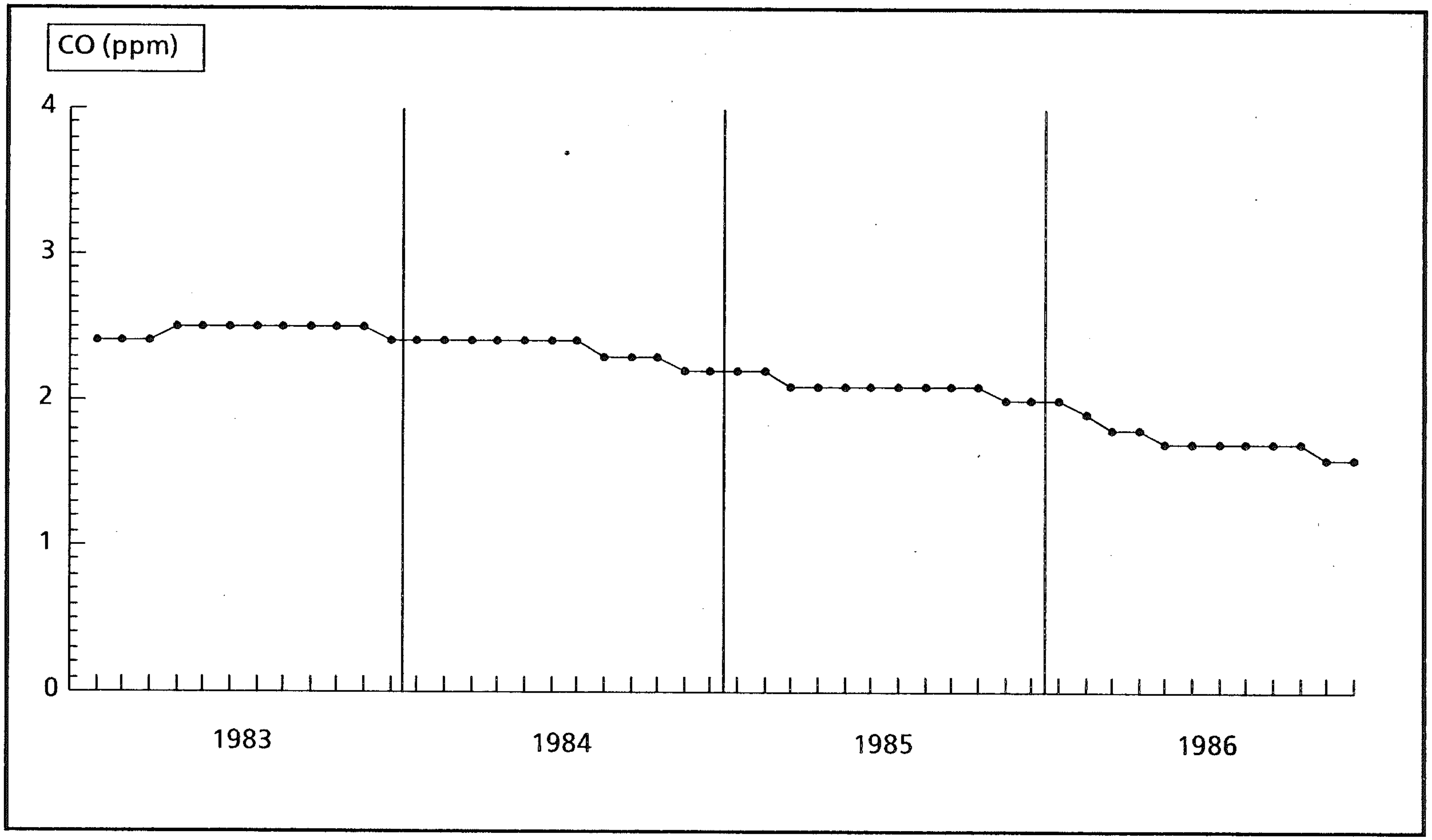


FIGURE 14, CONTINUED

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: NEW BRITAIN-002

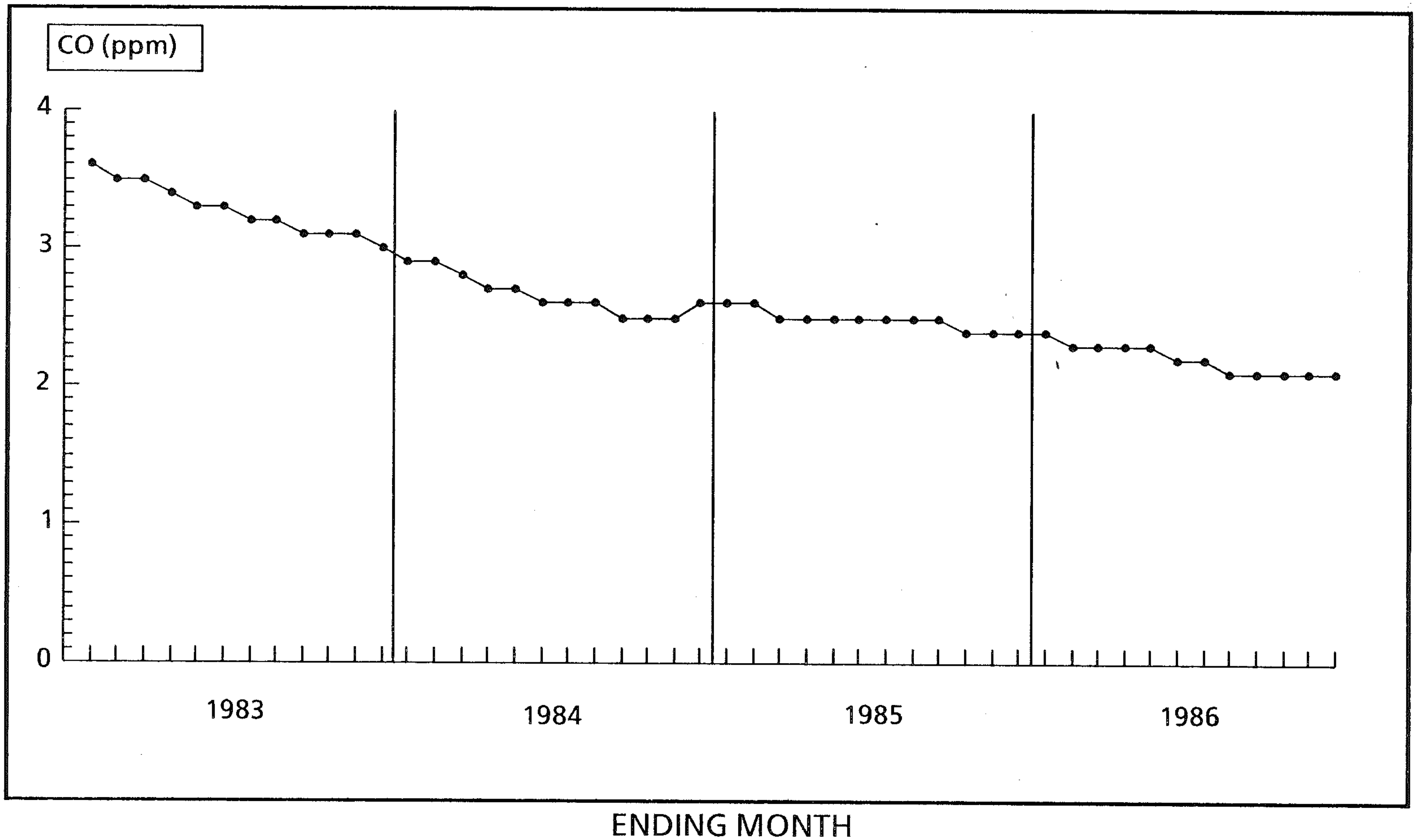


ENDING MONTH

FIGURE 14, CONTINUED

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: STAMFORD-020



VII. LEAD

HEALTH EFFECTS

Lead (Pb) is a soft, dull gray, odorless and tasteless heavy metal. It is a ubiquitous element that is widely distributed in small amounts, particularly in soil and in all living things. Although the metallic form of lead is reactive and rarely occurs in nature, lead is prevalent in the environment in the form of various inorganic compounds, and occasional concentrated deposits of lead compounds occur in the earth's crust.

The presence of lead in the atmosphere is primarily accounted for by the emissions of lead compounds from man-made processes, such as the extraction and processing of metallic ores, the incineration of solid wastes, and the operation of motor vehicles. The combustion of lead-containing gasoline by motor vehicles is the largest source of airborne lead emissions and is responsible for approximately 41% of the national total in 1986 -- down from 71% in 1985. These emissions are in the form of fine-to-course particulate matter and are comprised of lead sulfate, ammonium lead halides, and lead halides, of which the chief component is lead bromochloride. The halide compounds appear to undergo chemical changes over a period of hours and are converted to lead carbonate, oxide and oxycarbonate.

The most important sources of lead in humans and other animals are ingestion of foods and beverages, inhalation of airborne lead, and the eating of non-food substances. From the standpoint of the general population, the intake of lead into the body is primarily through ingestion. The direct intake of lead from the ambient air is relatively small.

Overexposure to lead in the United States is primarily a problem in children. Age, pica, diet, nutritional status, and multiple sources of exposure serve to increase the risk of lead poisoning in children. This is especially true in the inner cities where the prevalence of lead poisoning is greatest. Overexposure to lead compounds may result in undesirable biologic effects. These effects range from reversible clinical or metabolic symptoms that disappear after cessation of exposure to permanent damage or death from a single extreme dose or prolonged overexposure. Clinical lead poisoning is accompanied by symptoms of intestinal cramps, peripheral nerve paralysis, anemia, and severe fatigue. Very severe exposure results in permanent neurological, renal, or cardiovascular damage or death.

CONCLUSIONS

The Connecticut primary and secondary ambient air quality standard for lead and its compounds was not exceeded at any site in Connecticut during 1986.

The monitoring sites where the lead levels were highest were generally in urban locations with moderate to heavy traffic. In Connecticut, this is due to the fact that the primary source of lead to the atmosphere is the combustion of leaded gasoline in motor vehicles.

A downward trend in measured concentrations of lead has been observed since 1978. This is probably due to the increasing use of unleaded gasoline. Figure A shows that the decrease in lead emissions from gasoline combustion from 1977 to 1986 has been commensurate with a decrease in statewide ambient average lead concentrations. In fact, this relationship is so close, it has a correlation coefficient of 0.955 (see Figure B). Regarding Figures A and B, the reader should note that after 1978 and again after 1981 a change occurred in the way in which lead concentrations were determined. Before 1979, lead concentrations were determined by analysis of quarterly composite samples from existing TSP monitors. From 1979 through 1981, lead concentrations were determined by analysis of individual daily samples from existing TSP monitors. Beginning in 1982, lead concentrations were determined by analysis of monthly composite samples from only approved lead monitors. Both the single sample and monthly composite data points are depicted in Figure A for 1982. The discontinued method gives a lower average lead concentration in 1982 than the new method. The higher average lead concentration is used in Figure B.

SAMPLE COLLECTION AND ANALYSIS

The Air Monitoring Unit uses hi-vol and lo-vol samplers to obtain ambient concentrations of lead. These samplers are used to collect particulate matter onto fiberglass filters. The particulate matter collected on the filters is subsequently analyzed for its chemical composition. Wet chemistry techniques are used to separate the particulate matter into various components. The lead content of the TSP is determined using an atomic absorption spectrophotometer. (The use of these sampling devices and the chemical analysis techniques were fully described in the TSP section.) Unlike hi-vol TSP samples which are analyzed separately, the hi-vol lead sample is a composite of all the individual samples obtained at a site in a single month. That is, a cutting is taken from each filter during the month and these cuttings are collectively chemically analyzed for lead.

DISCUSSION OF DATA

Monitoring Network - In 1986, both hi-vol and lo-vol samplers were operated in Connecticut to monitor lead levels (see Figure 15). There were 14 hi-vol sites and 6 lo-vol sites operated throughout the State (see Table 35) as part of the State and Local Air Monitoring Stations (SLAMS) network. The DEP operated the six lo-vol monitors in areas with populations of 200,000 or more. They are Bridgeport 010, Hartford 015 and 016, New Haven 018, Stamford 022, and West Haven 003. These "micro-scale" lead sites are situated near some of the busiest city streets and highways in order to monitor "worst-case" lead concentrations. EPA approval for these lo-vol monitors was granted in February, 1984.

Precision and Accuracy - The hi-vol lead monitors had a total of 36 precision checks in 1986. The resulting 95% probability limits were -9% to +9%. Accuracy for lead is defined as the accuracy of the analysis method. It is determined by chemical analysis of known lead samples. There were 12 audits for accuracy conducted on the monitoring network in 1986. Two different concentration levels were tested: low and high. The 95% probability limits for the low level test ranged from -4% to +5%; those for the high level test ranged from -2% to +4%.

NAAQS - Connecticut's ambient air quality standard for lead and its compounds, measured as elemental lead, is: 1.5 micrograms per cubic meter ($\mu g/m^3$), maximum arithmetic mean averaged over three consecutive calendar months. This standard was enacted on November 2, 1981. Previously, Connecticut's lead standard was substantially identical to the national standard: 1.5 $\mu g/m^3$ for a calendar quarter-year average. The change to a 3-month running average means that a more stringent standard now applies, since there are three times as many data blocks within a calendar year which must be below the limiting concentration of 1.5 $\mu g/m^3$.

3-Month Running Averages - Three-month running average lead concentrations are given in Table 27 for the year 1986. These values are also presented in graphical form in Figure 16 for the period 1984-86.

Trends - As was mentioned above, airborne concentrations of lead have been trending steadily downward. This was demonstrated on a statewide level in Figure A. The trend in lead levels can also be shown on a regional or a site-specific basis. Figure C shows the trend in annual average lead concentrations at each of six monitoring sites that have been in existence long enough to be able to demonstrate a long term trend. Figure D shows the trends in the 3-year running average lead concentrations at the same six sites. A downward trend in lead levels is apparent at all the sites, especially since 1978. This decrease in lead levels is commensurate with the decrease in lead emissions from gasoline combustion.

FIGURE A

STATEWIDE ANNUAL LEAD EMISSIONS FROM GASOLINE

AND

STATEWIDE ANNUAL AVERAGE LEAD CONCENTRATIONS

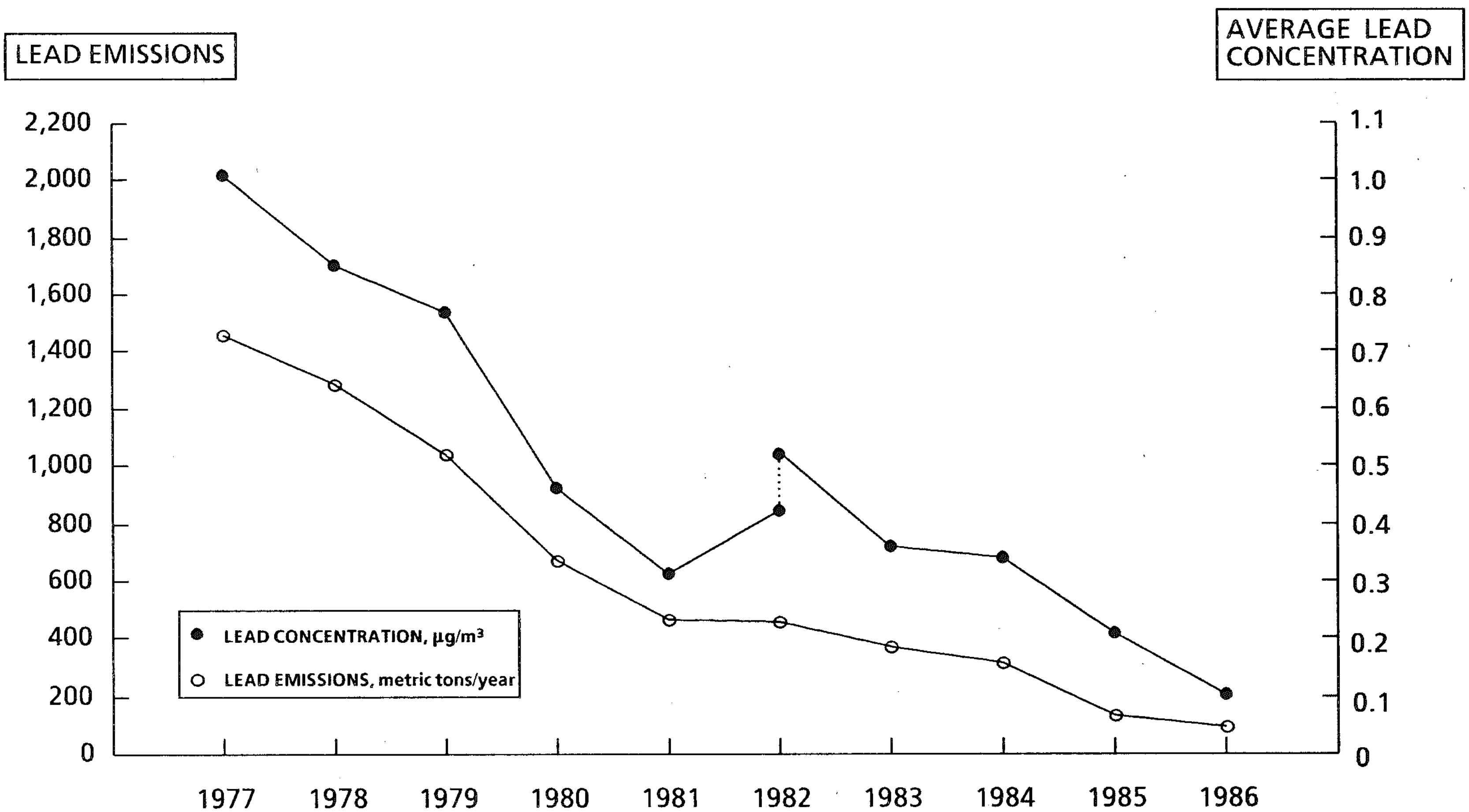
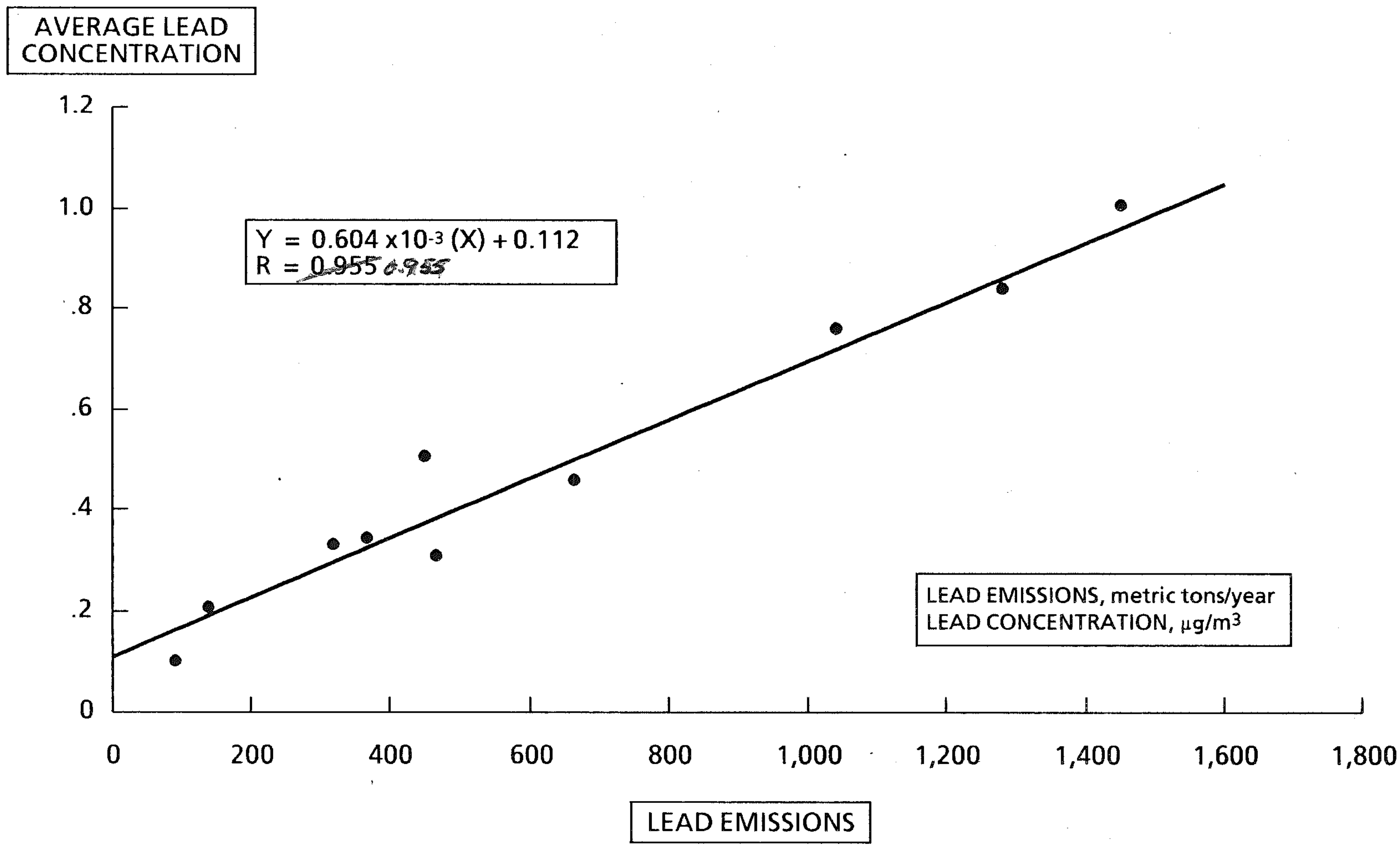


FIGURE B

STATEWIDE ANNUAL AVERAGE LEAD CONCENTRATIONS

VS.

STATEWIDE ANNUAL LEAD EMISSIONS FROM GASOLINE



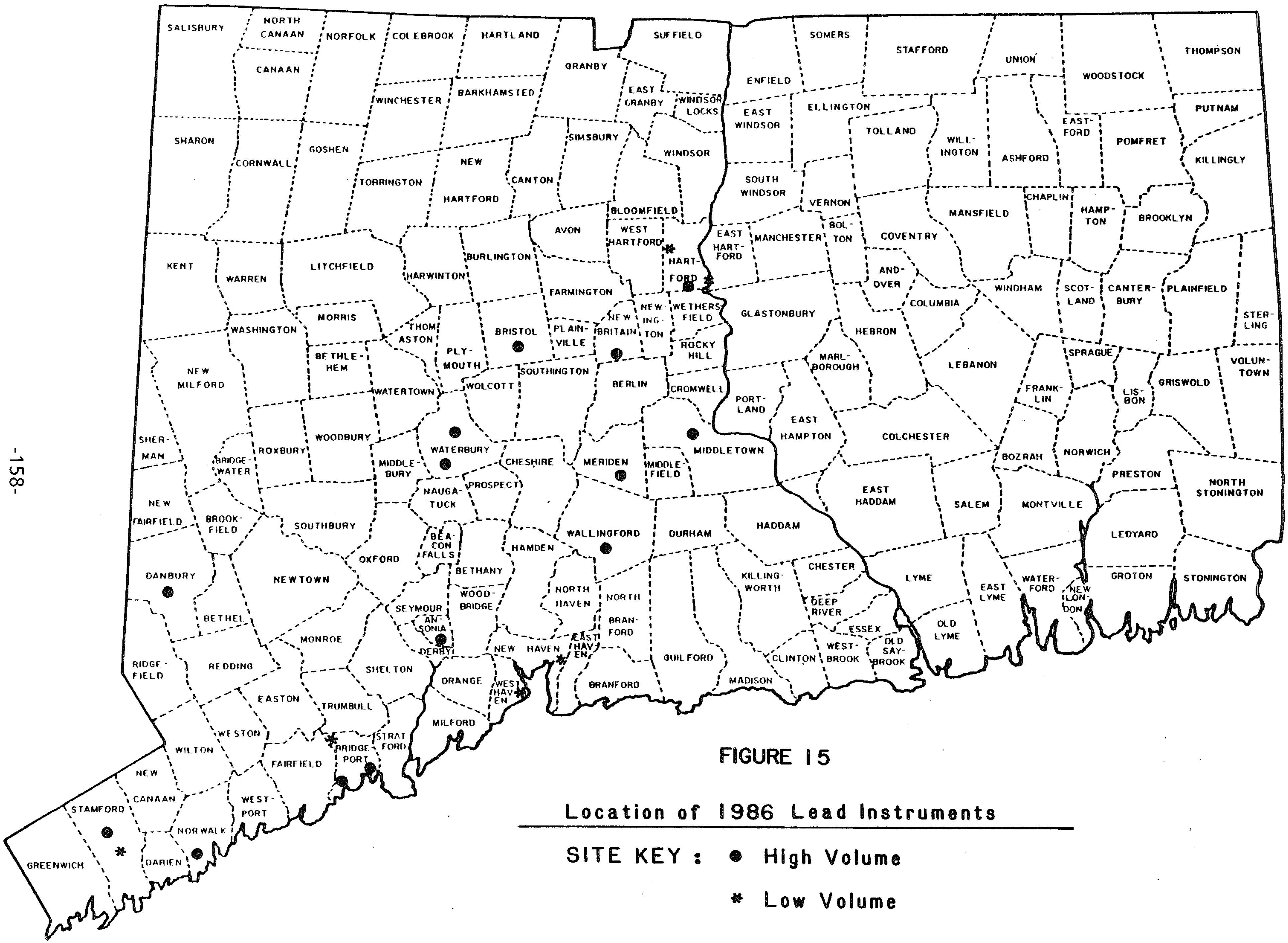


FIGURE 15

Location of 1986 Lead Instruments

SITE KEY : ● High Volume

* Low Volume

TABLE 27

1986 3-MONTH RUNNING AVERAGE LEAD CONCENTRATIONS

TOWN-SITE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ansonia-004	0.09	0.09	0.07	0.08	0.07	0.06	0.04	0.04	0.05	0.05	0.07	0.10
Bridgeport-009	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07
Bridgeport-010	-----	-----	0.10	0.09	0.12	0.13	0.13	0.12	0.10	0.11	0.11	0.11
Bridgeport-123	0.12	0.13	0.12	0.11	0.10	0.11	0.09	0.09	0.09	0.10	0.12	0.13
Bristol-001	0.10	0.08	0.08	0.07	0.07	0.06	0.05	0.05	0.05	0.05	0.06	0.08
Danbury-002	0.09	0.08	0.08	0.07	0.07	0.06	0.05	0.06	0.07	0.08	0.08	-----
Hartford-014	0.11	0.09	0.08	0.08	0.07	0.07	0.06	0.07	0.07	0.08	0.10	0.11
Hartford-015	0.18	0.14	0.12	0.12	0.13	0.14	0.14	0.13	0.13	0.12	0.14	-----
Hartford-016	0.18	0.13	0.11	0.12	0.14	0.15	0.16	0.18	0.17	0.17	0.17	0.16
Meriden-002	0.13	0.13	0.12	0.08	0.08	0.07	0.06	0.09	0.09	0.10	0.11	0.12
Middletown-003	0.11	0.10	0.09	0.09	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.09
New Britain-007	0.08	0.08	0.06	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.07	0.08
New Haven-018	-----	0.26	0.24	0.23	0.22	-----	-----	-----	0.20	0.20	0.19	0.19
Norwalk-012	0.10	0.09	0.10	0.08	0.09	0.08	0.06	0.06	0.06	0.07	0.09	-----
Stamford-001	0.07	0.06	0.07	0.09	0.10	0.09	0.07	0.07	0.07	0.06	0.07	0.07
Stamford-022	0.15	0.12	0.13	0.11	0.13	0.14	0.15	0.14	0.12	0.11	0.10	0.09
Wallingford-001	0.09	0.09	0.07	0.07	0.06	0.06	0.06	0.06	0.07	0.08	0.08	0.10
Waterbury-007	0.18	0.16	0.15	0.14	0.12	0.11	0.09	0.10	0.10	0.11	0.14	0.16
Waterbury-123	0.20	0.19	0.17	0.14	0.14	0.13	0.12	0.13	0.14	0.15	0.16	0.18
West Haven-003	0.20	0.18	0.15	0.14	0.11	-----	-----	-----	0.11	------	-----	-----

N.B. The lead concentrations are in terms of micrograms per cubic meter (μg/m³).

FIGURE 16

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=ANSONIA 004

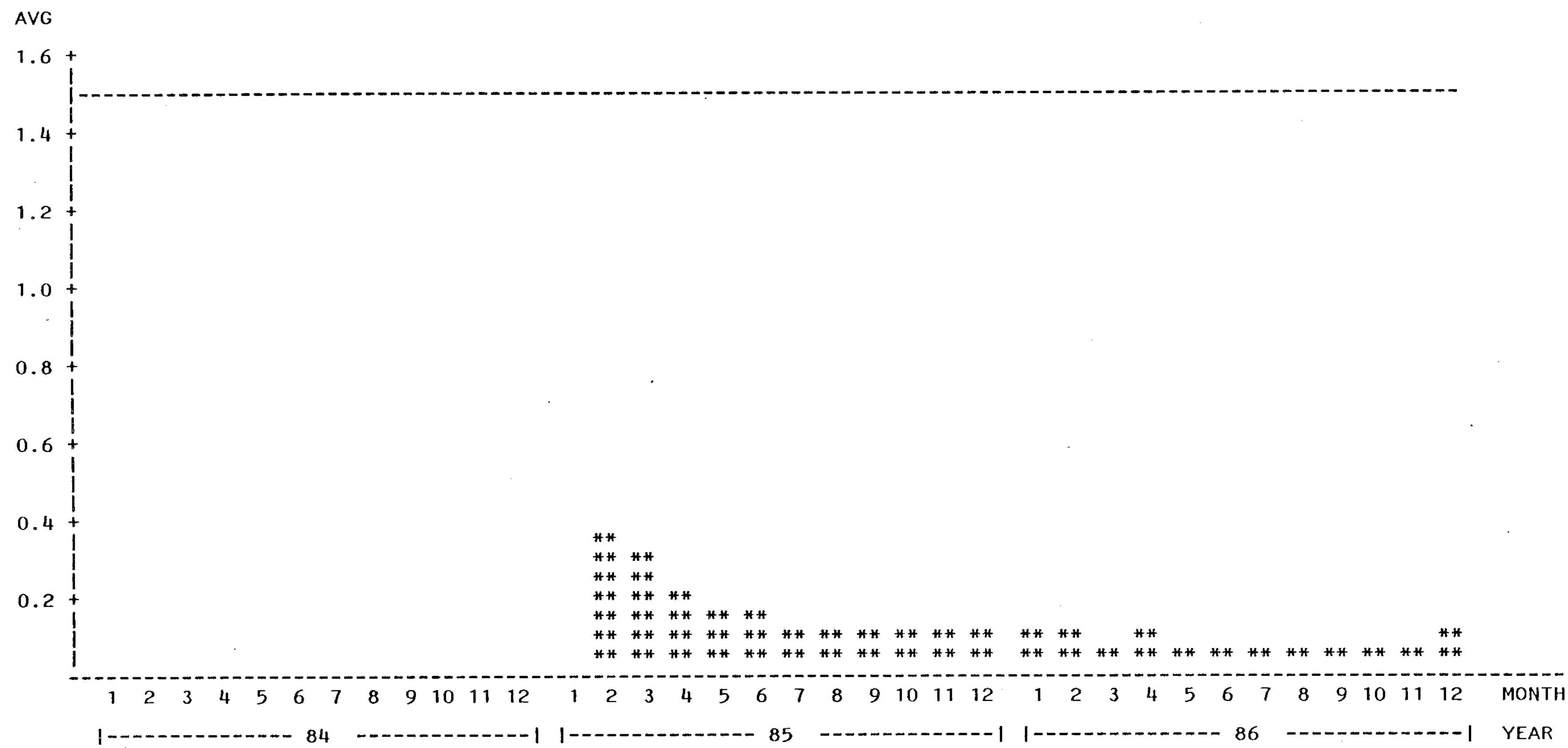


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 009

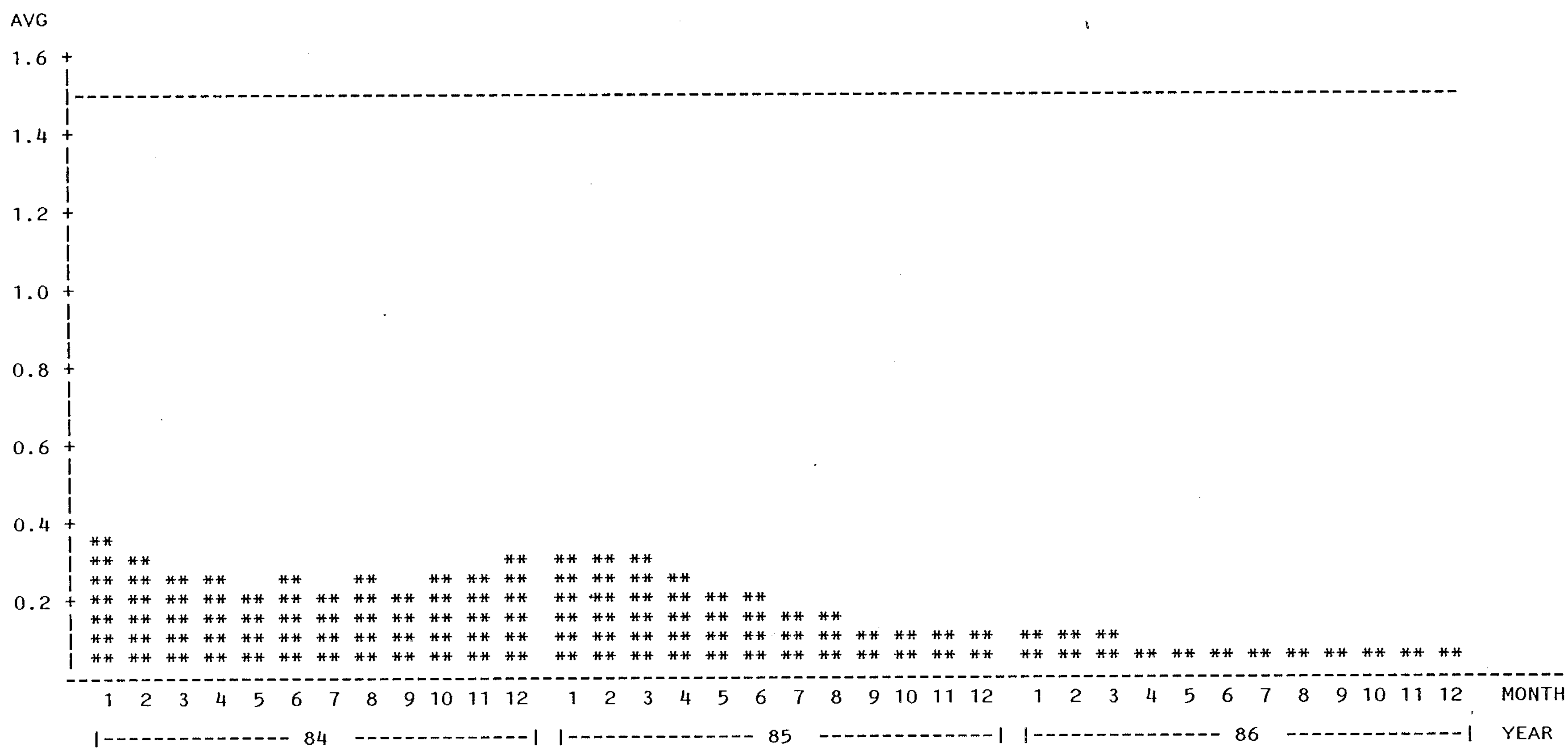


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 010

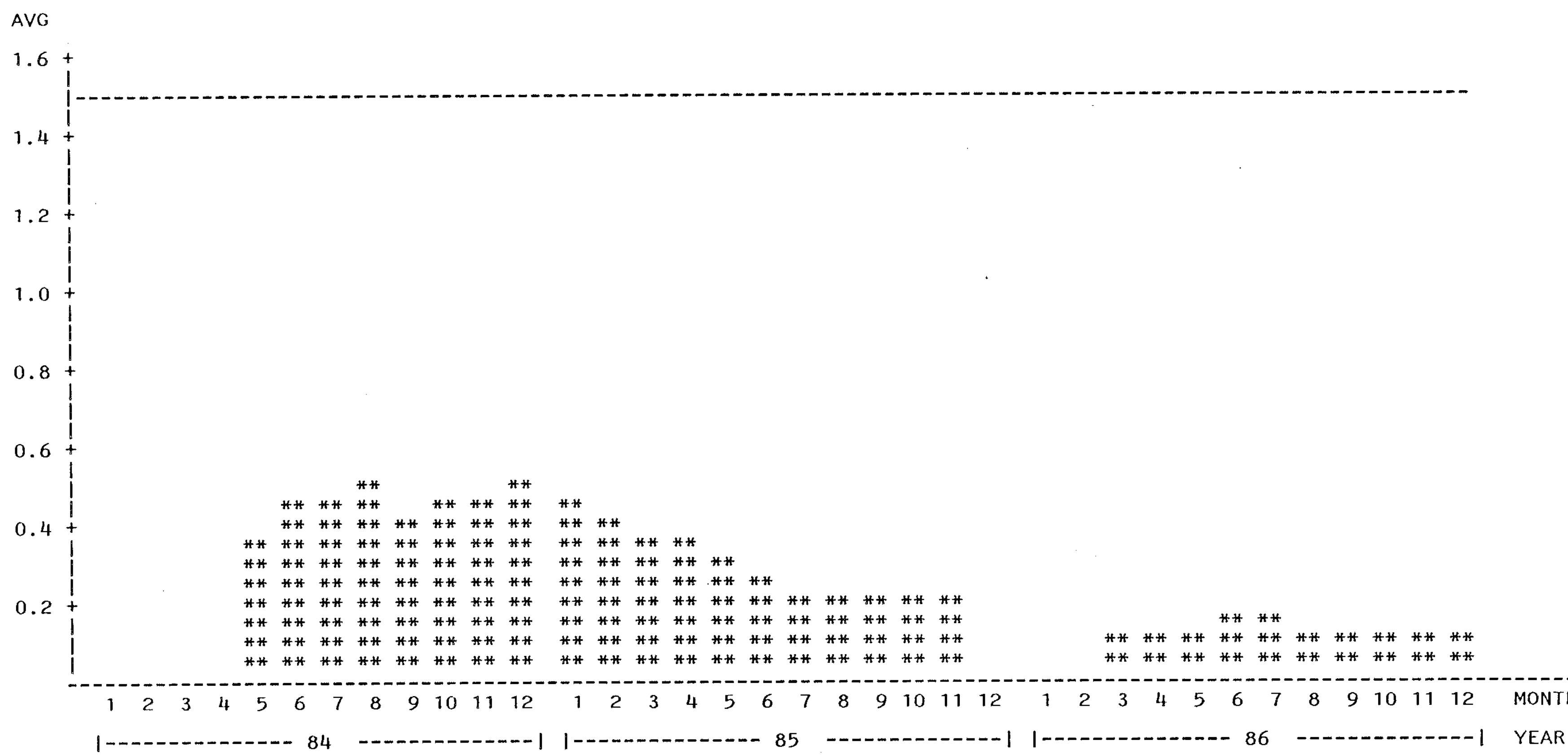


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 123

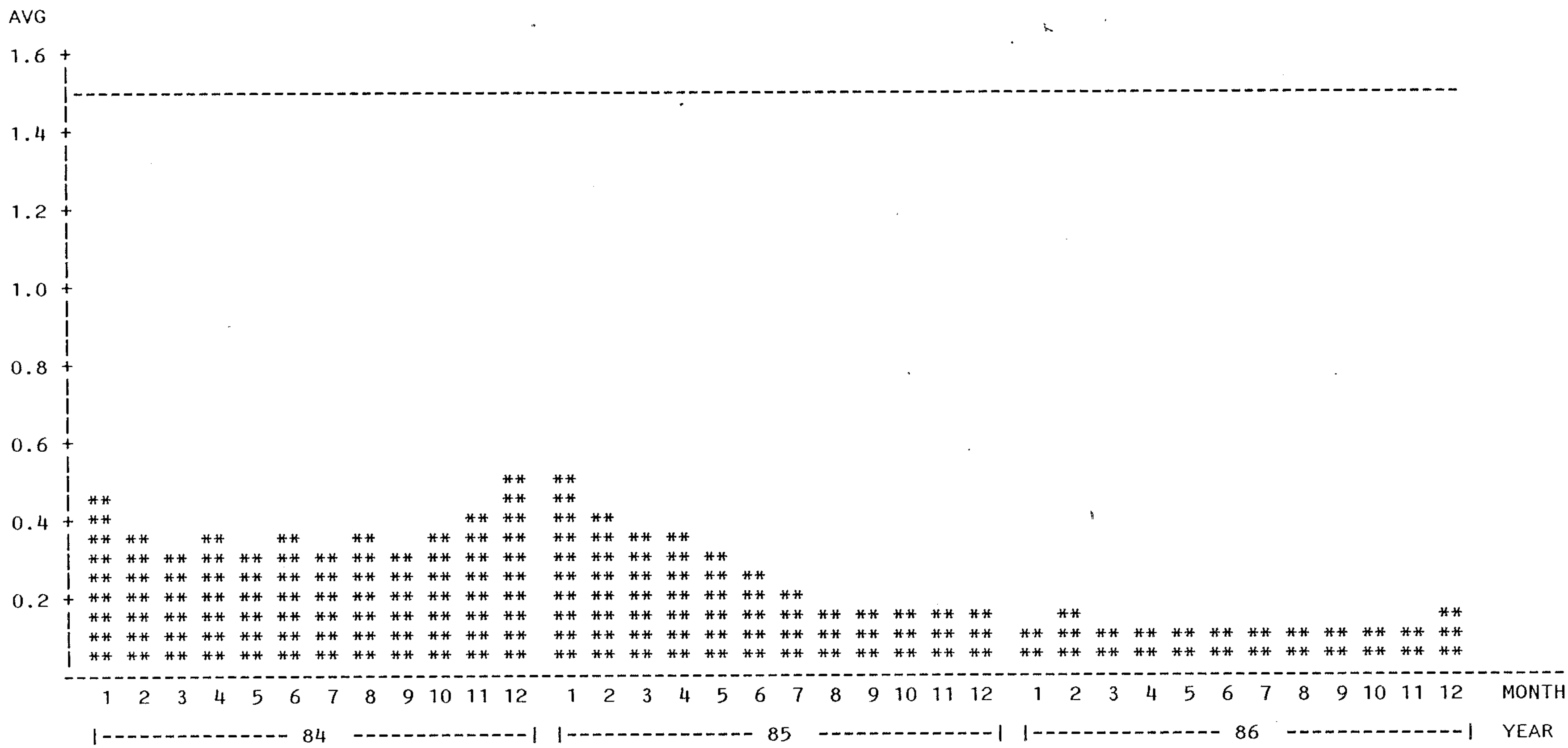


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRISTOL 001

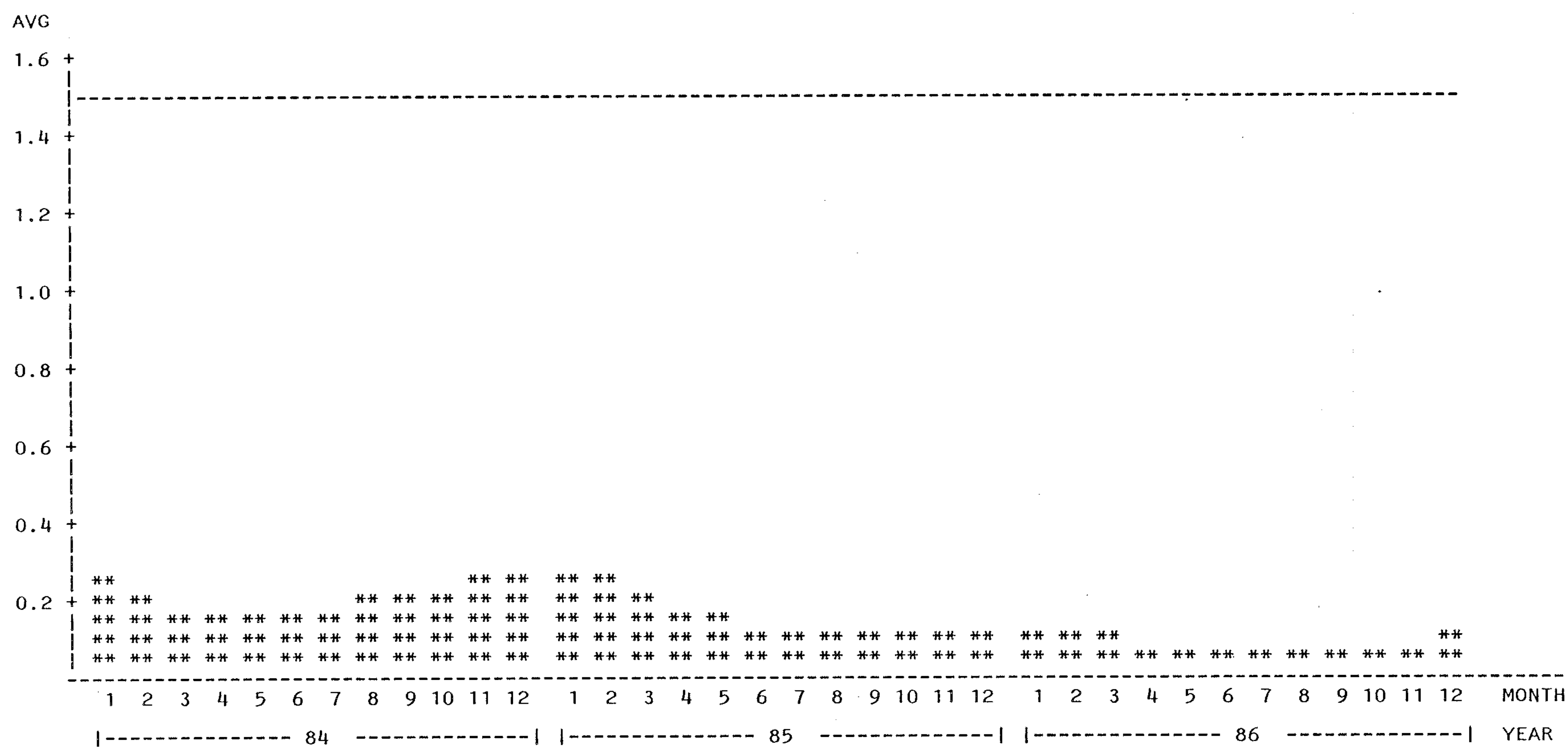


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=DANBURY 002

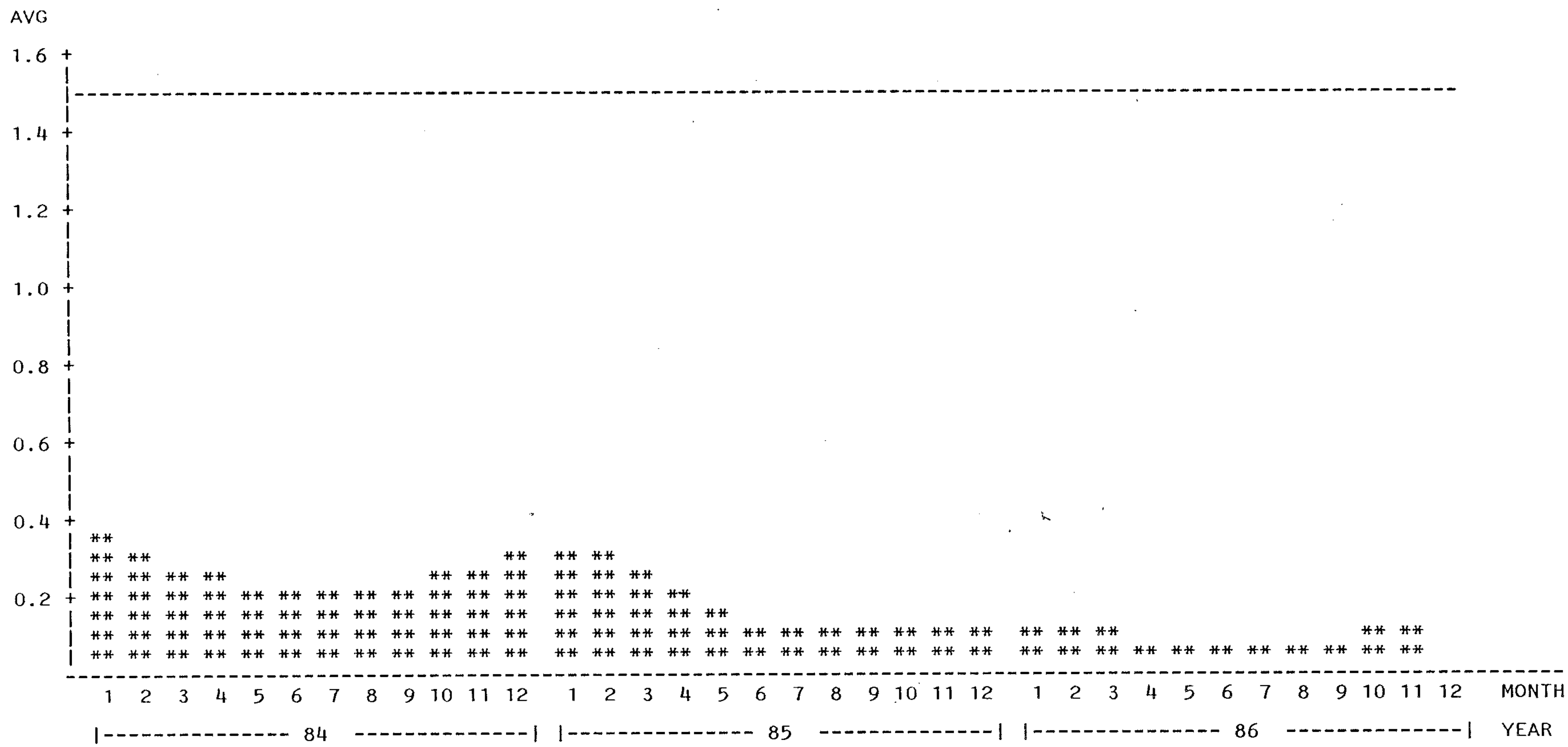


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 014

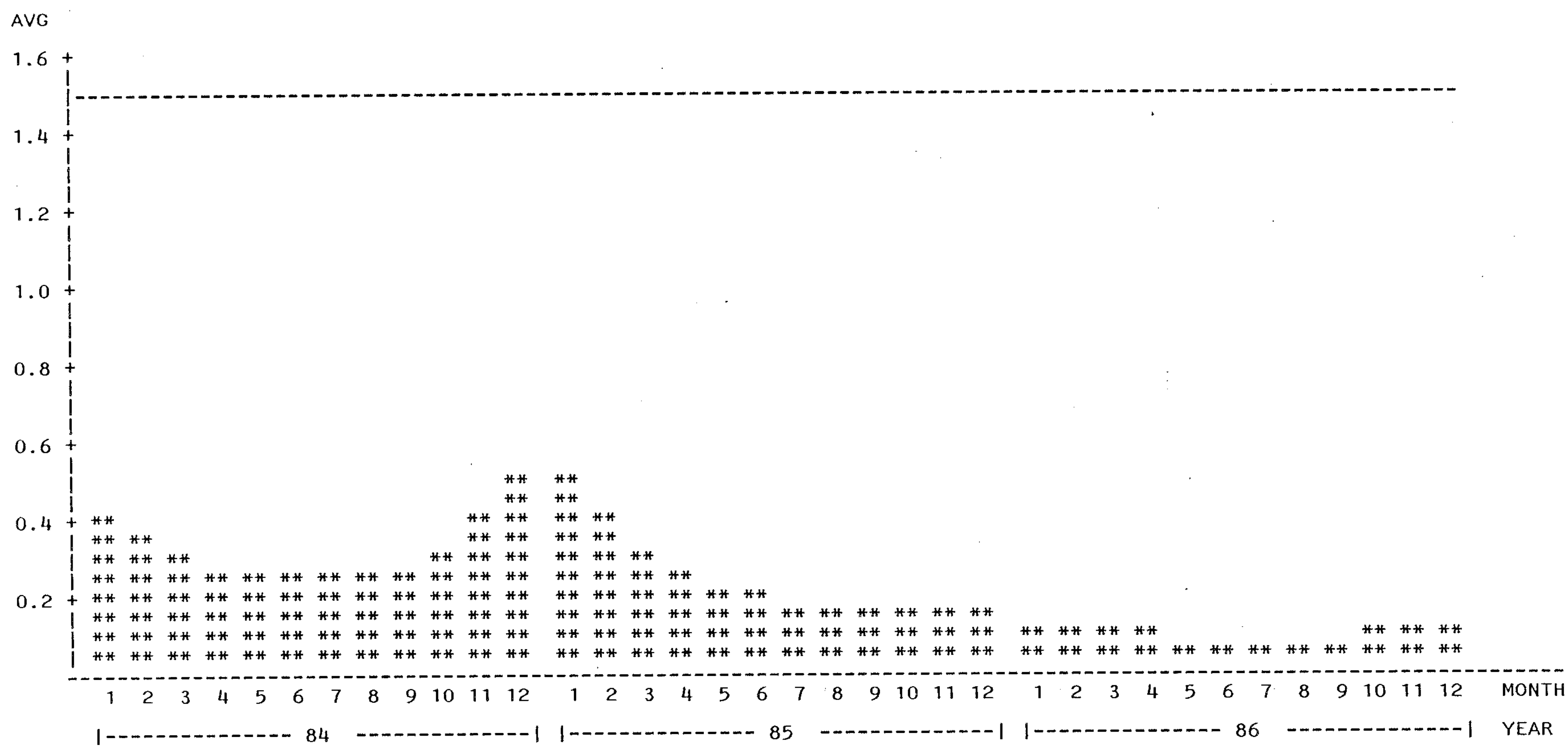


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 015

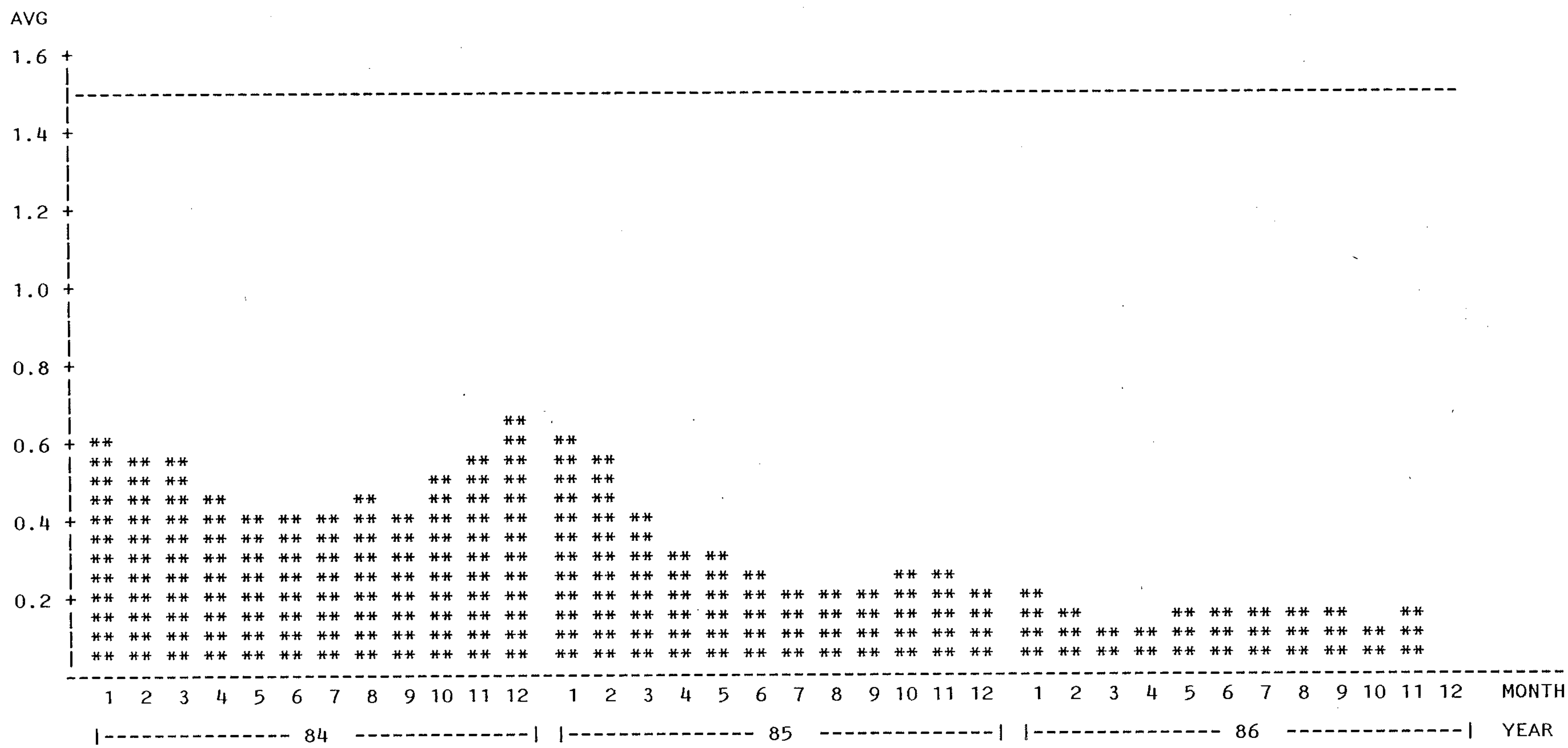


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 016

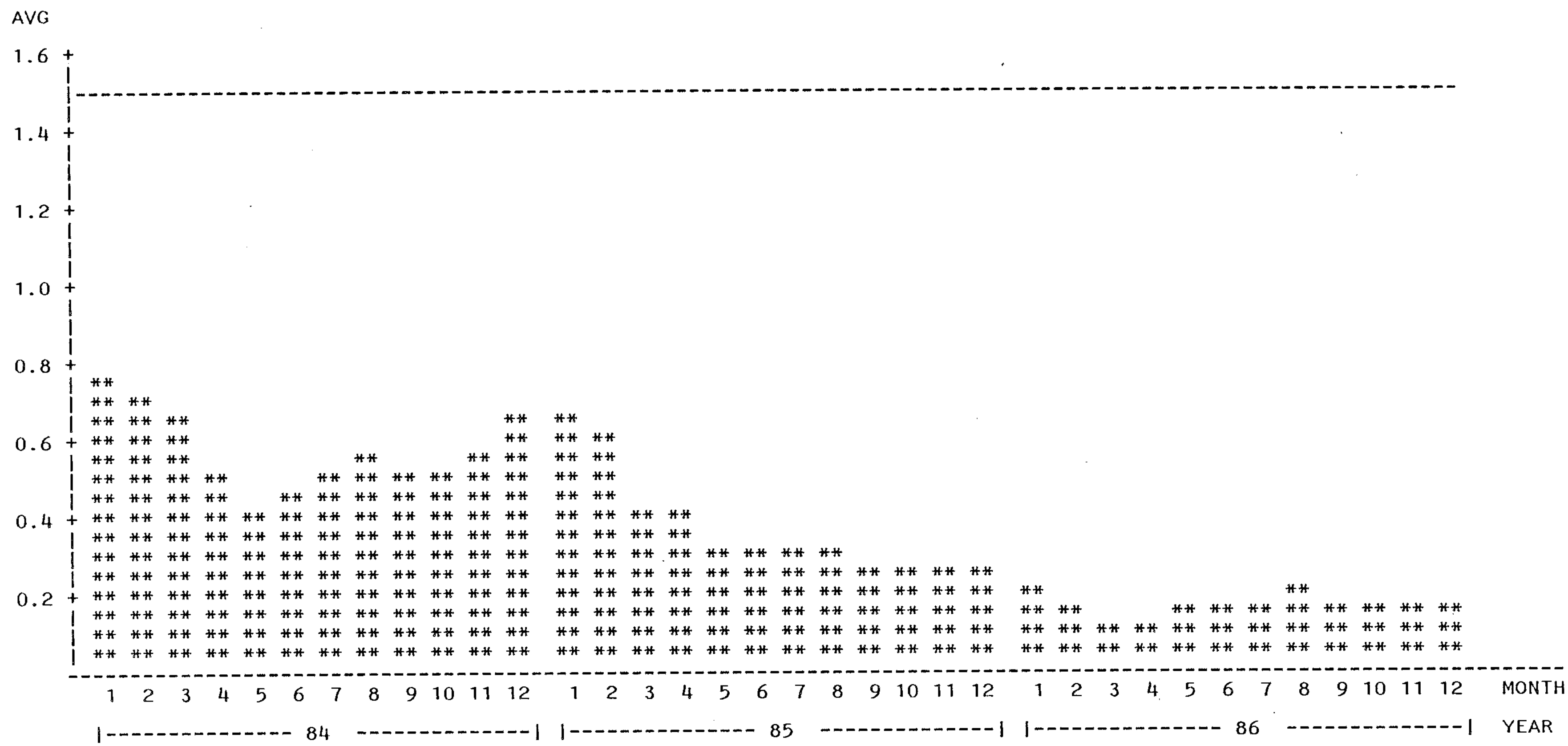


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=MERIDEN 002

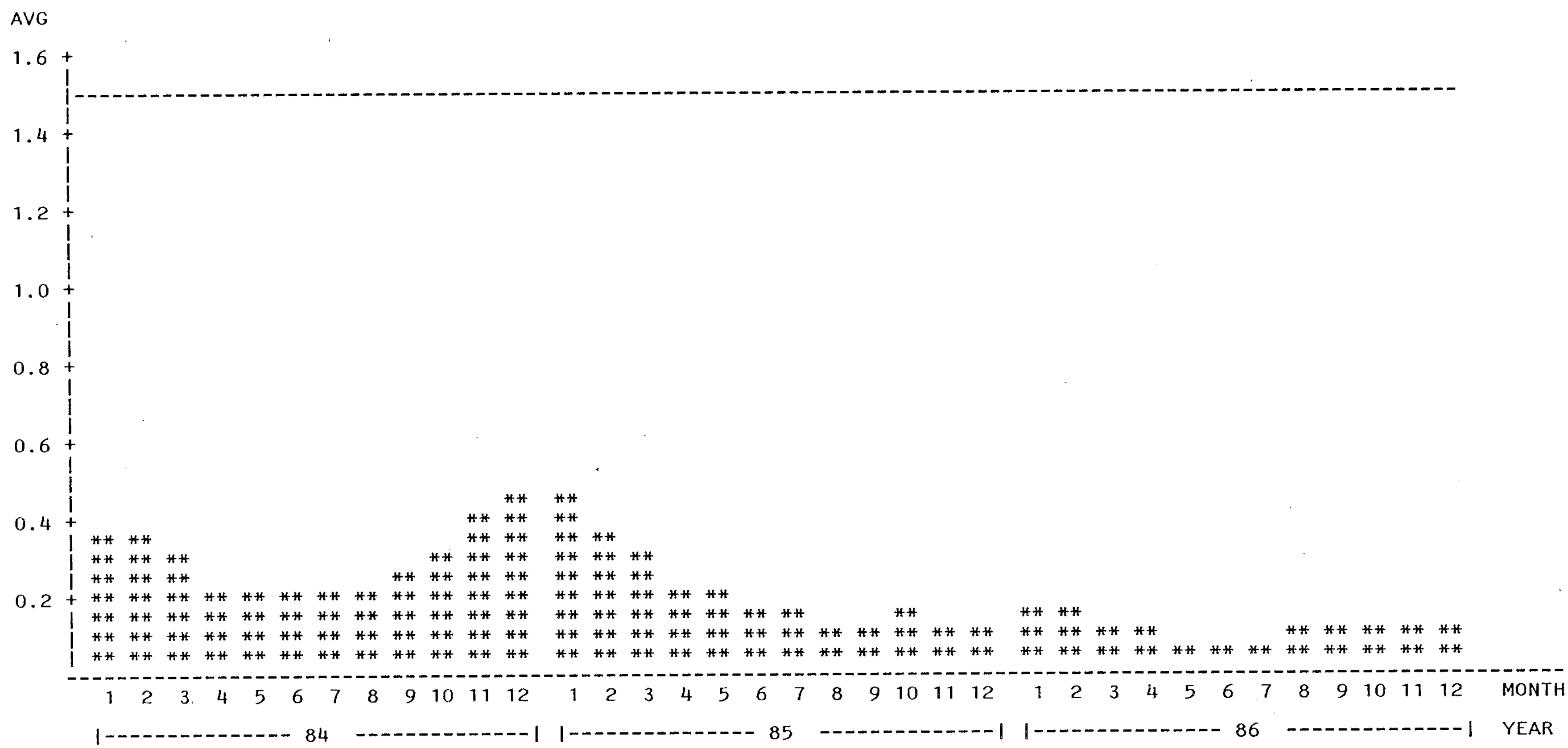


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=MIDDLETOWN 003

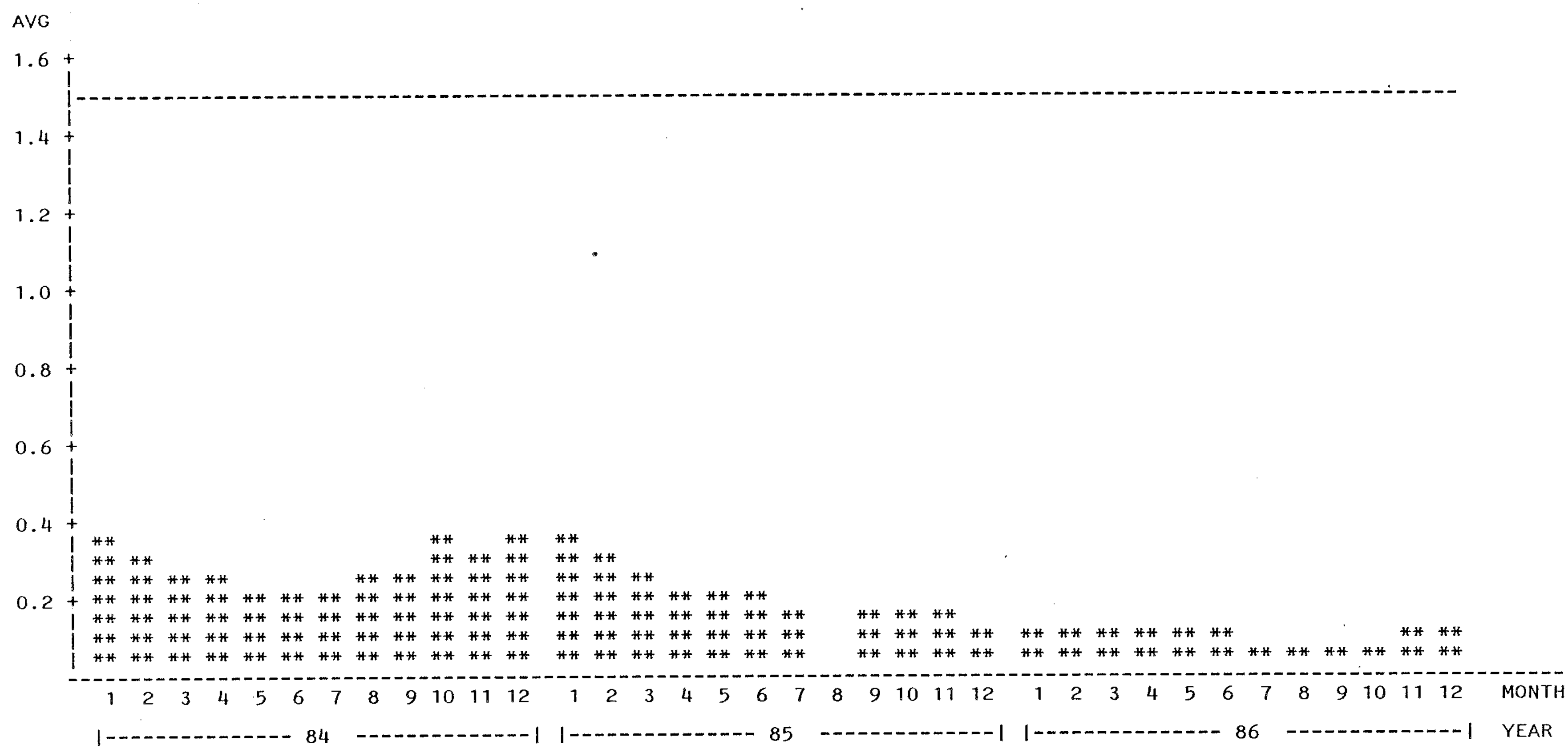


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NEW BRITAIN 007

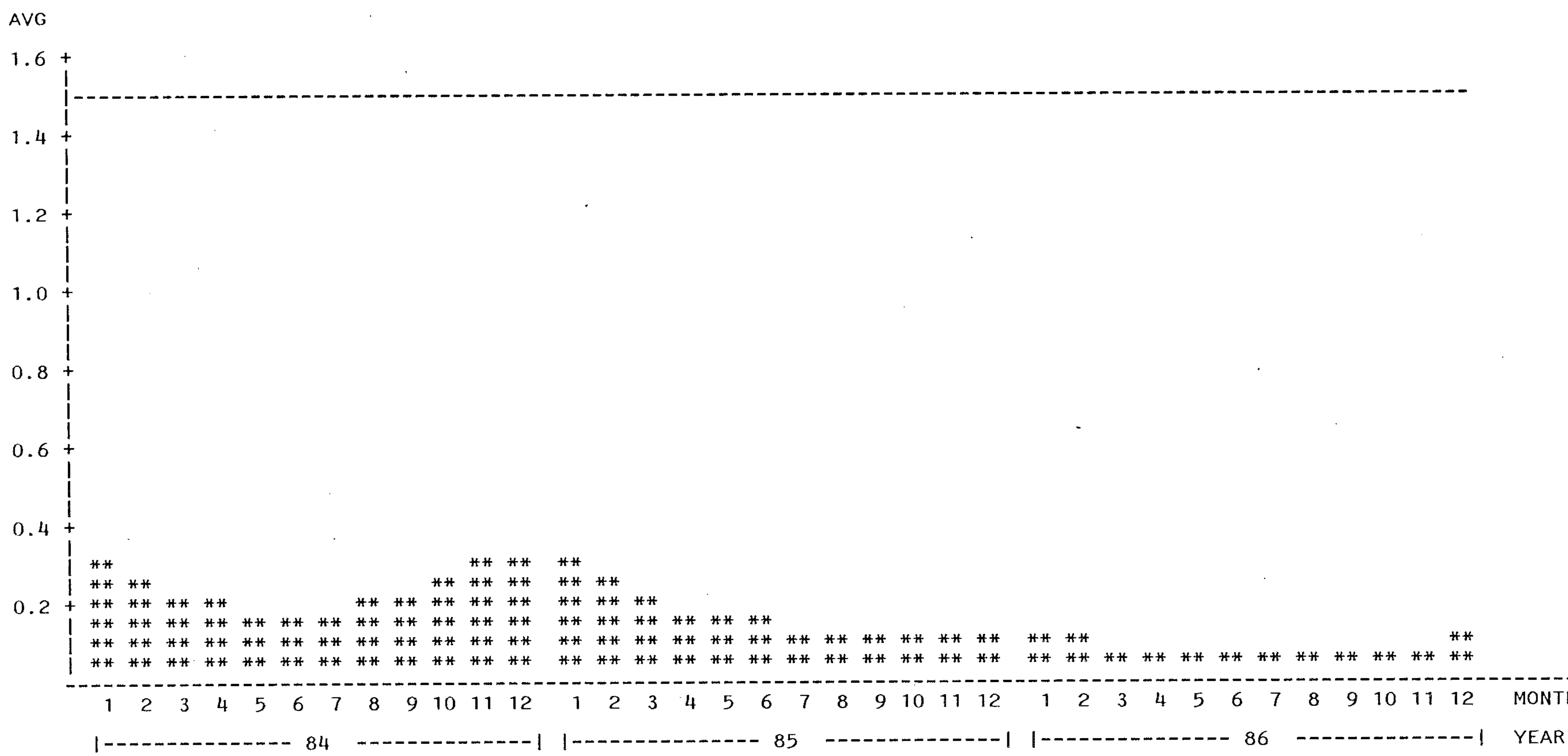


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NEW HAVEN 018

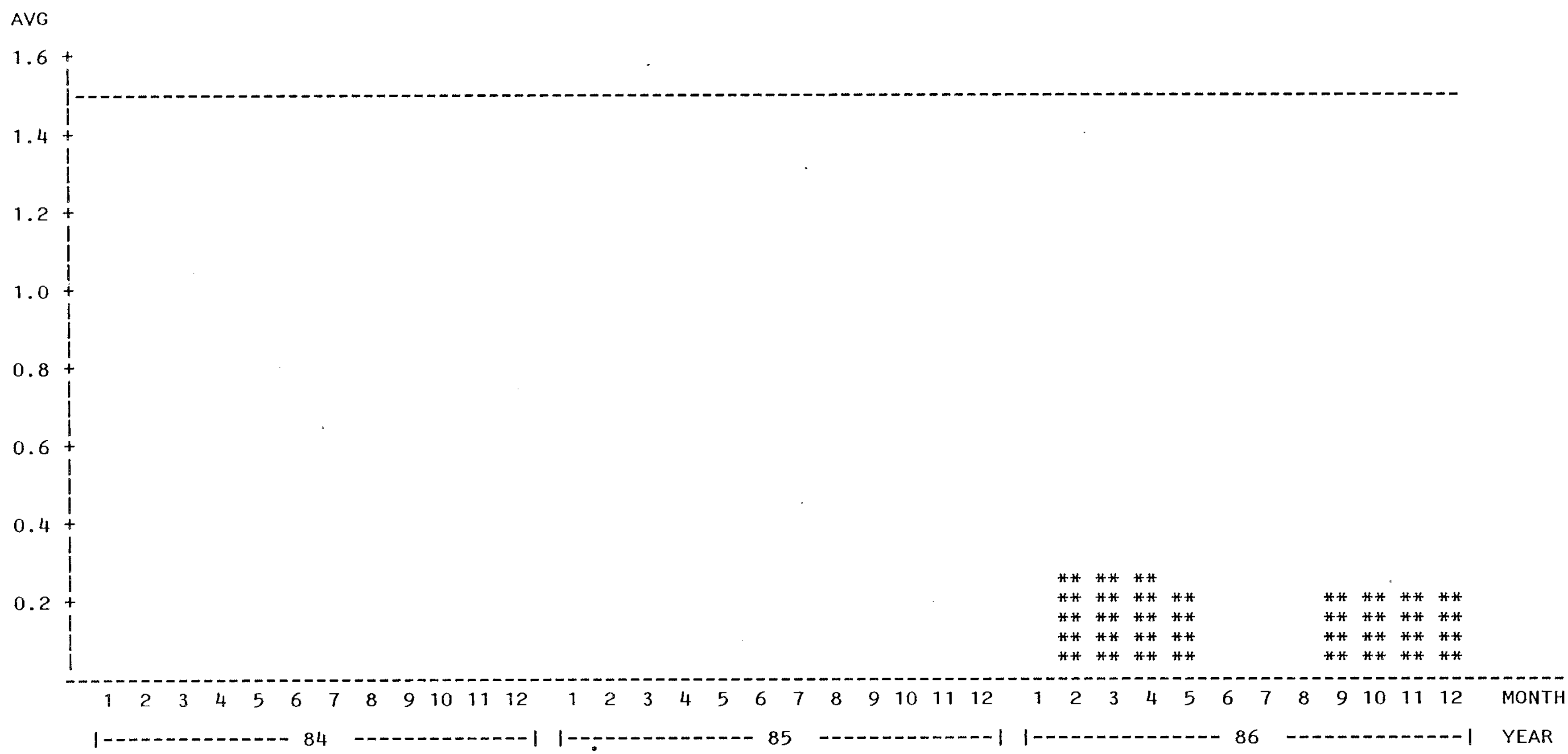


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NORWALK 012

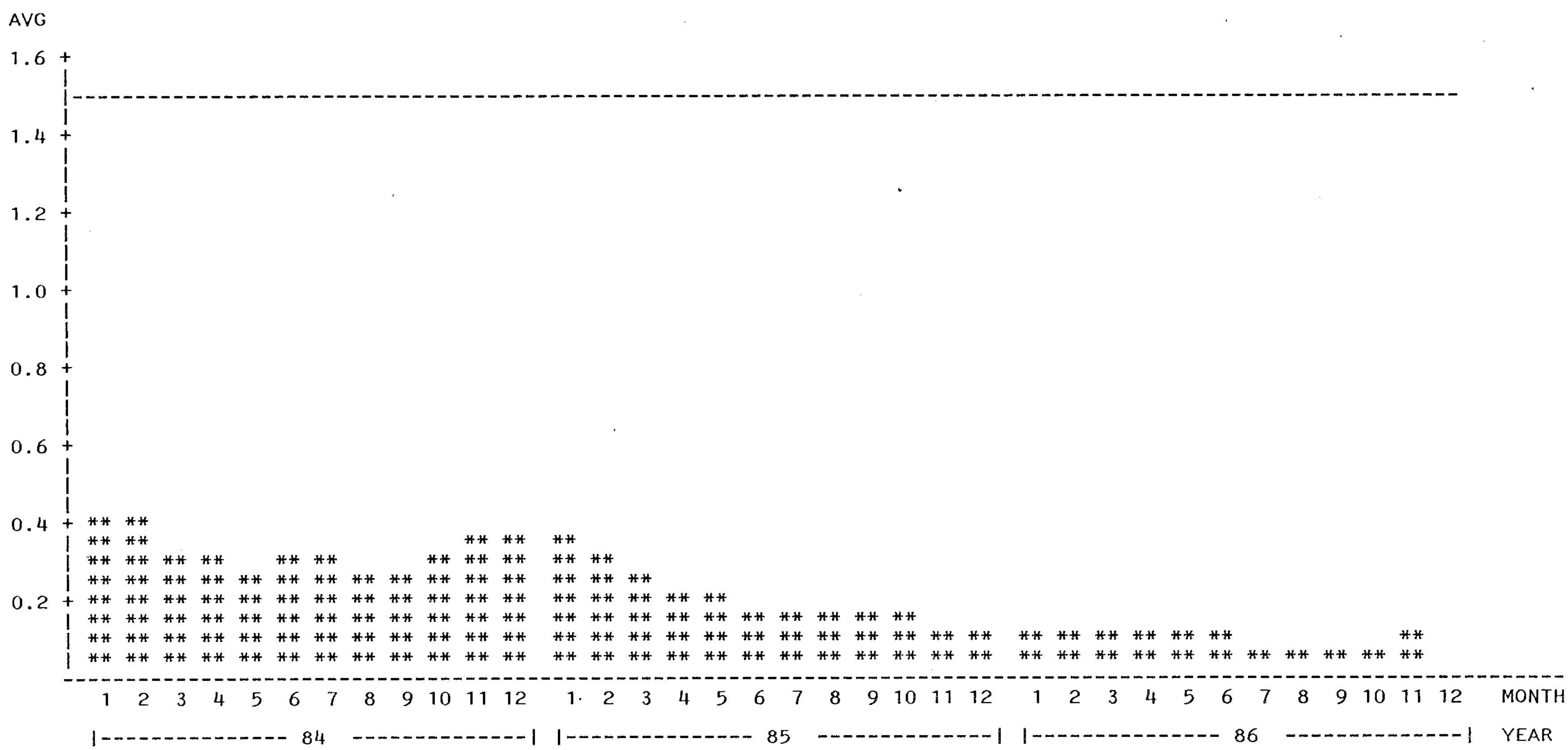


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=STAMFORD 001

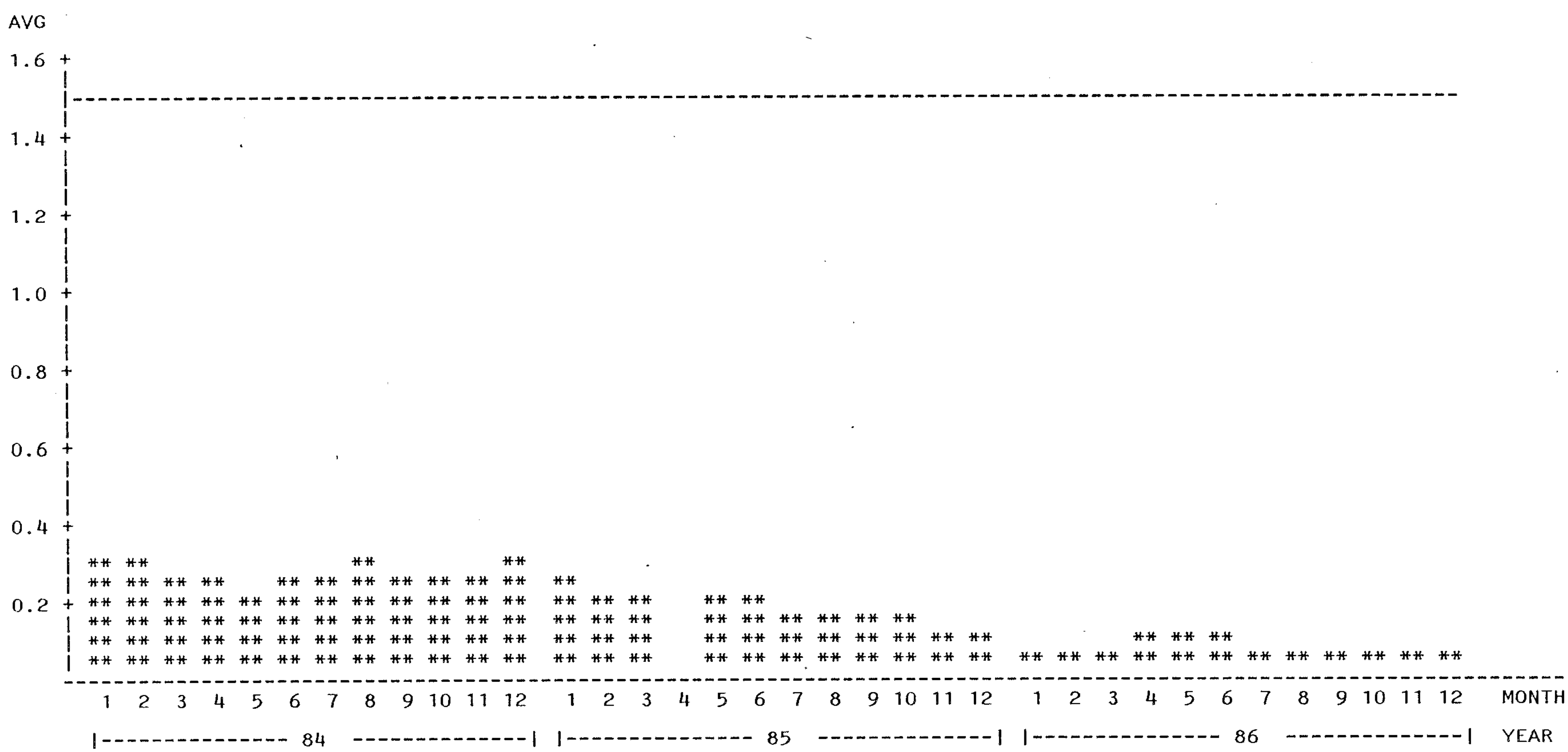


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=STAMFORD 022

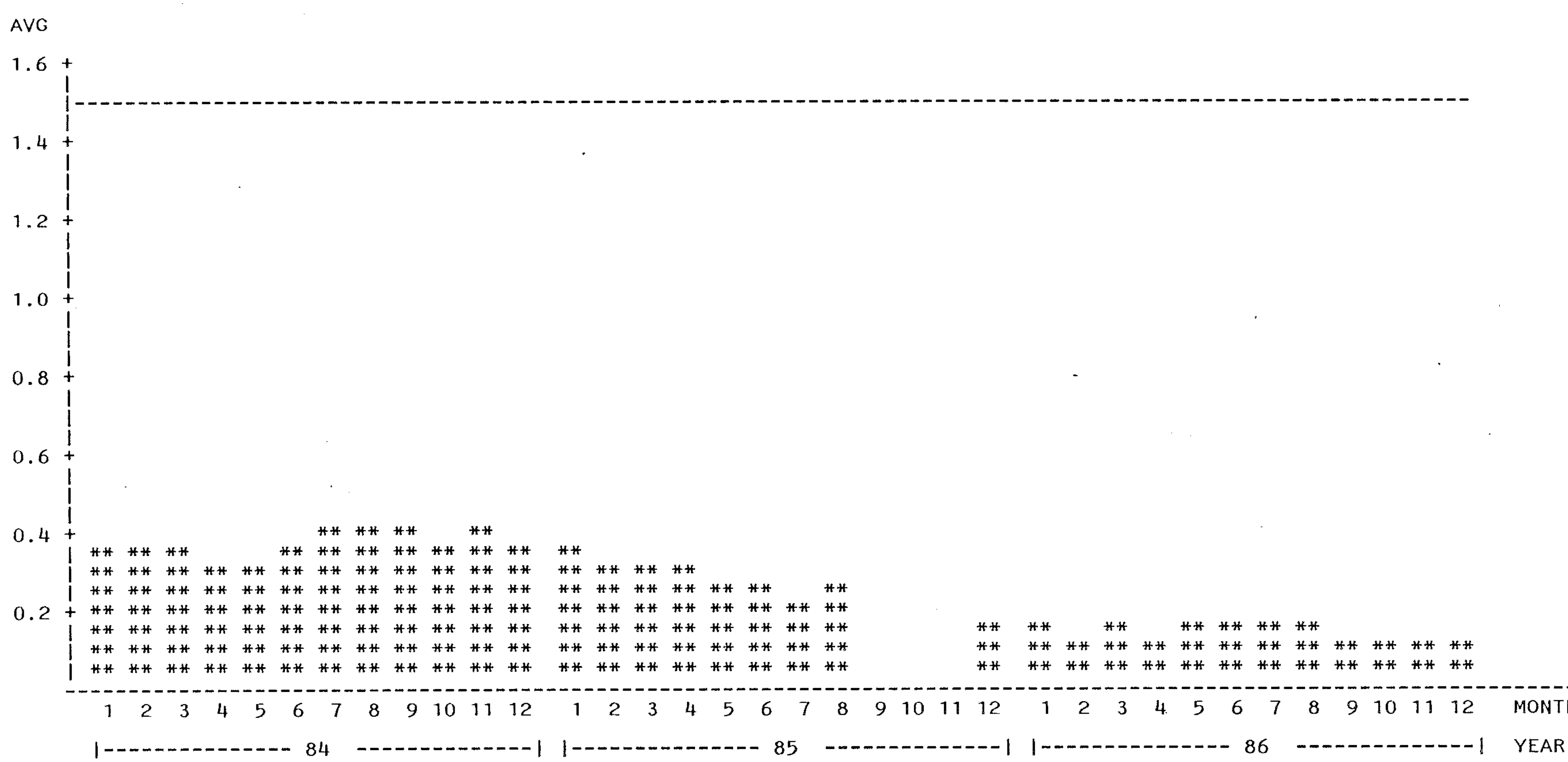


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WALLINGFORD 001

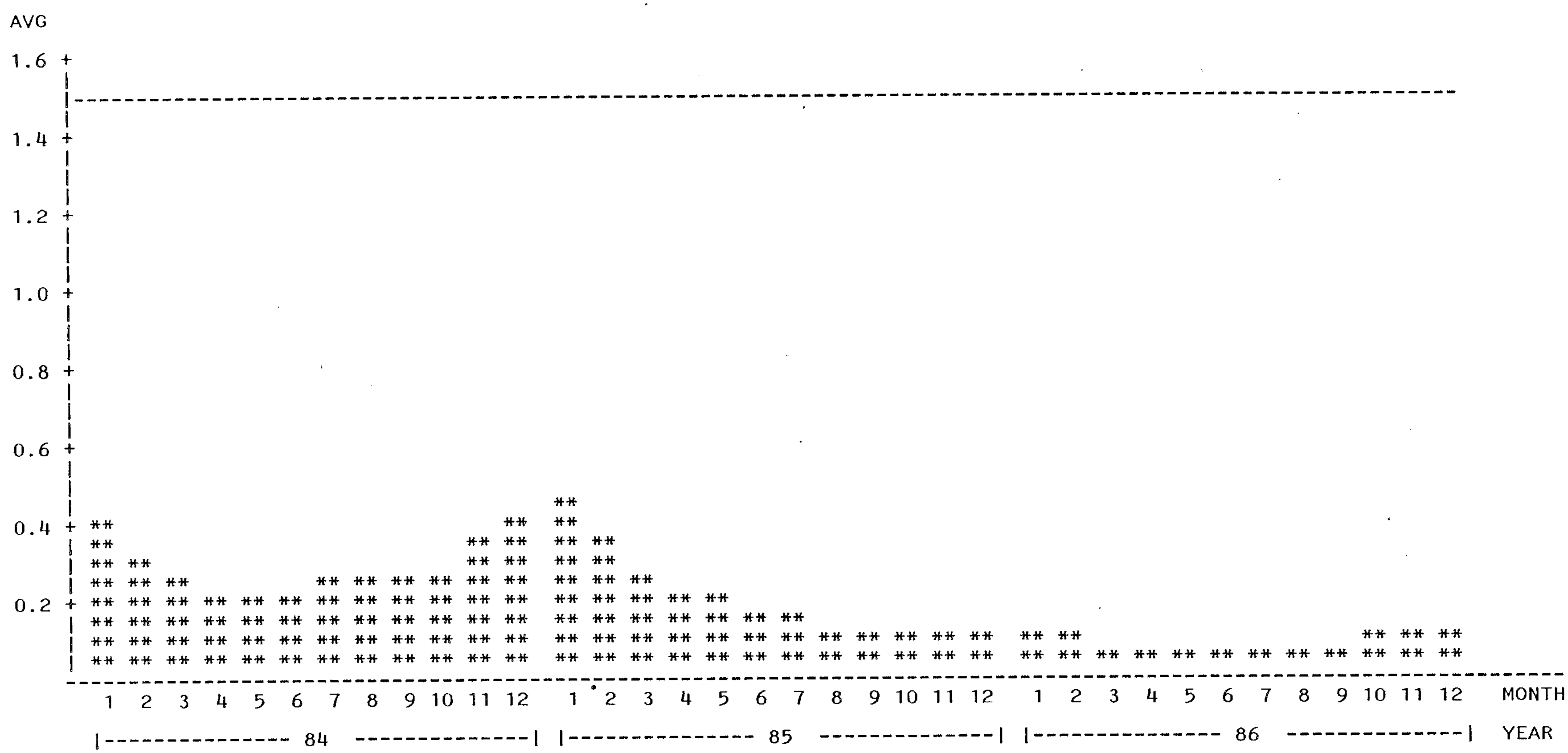


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WATERBURY 007

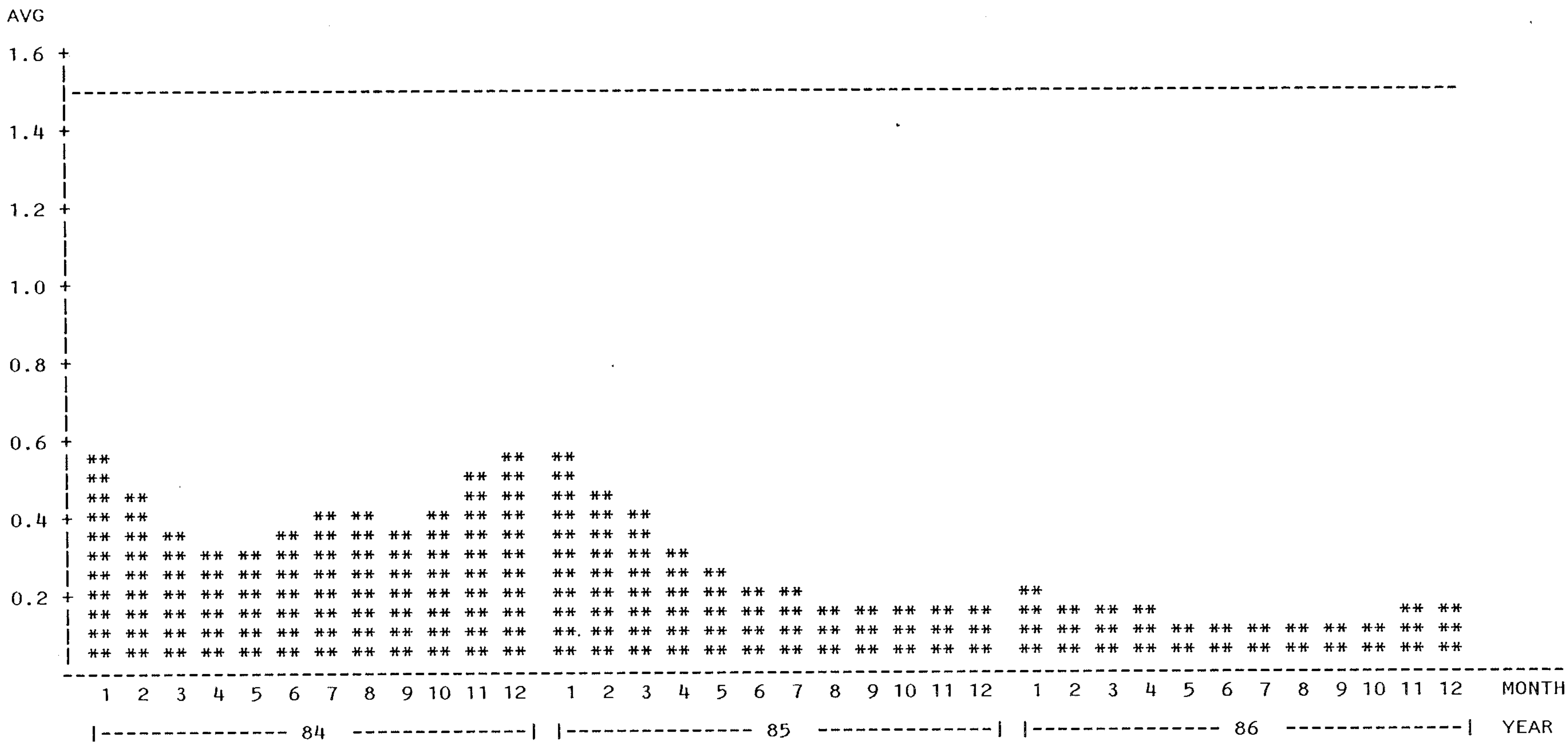


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WATERBURY 123

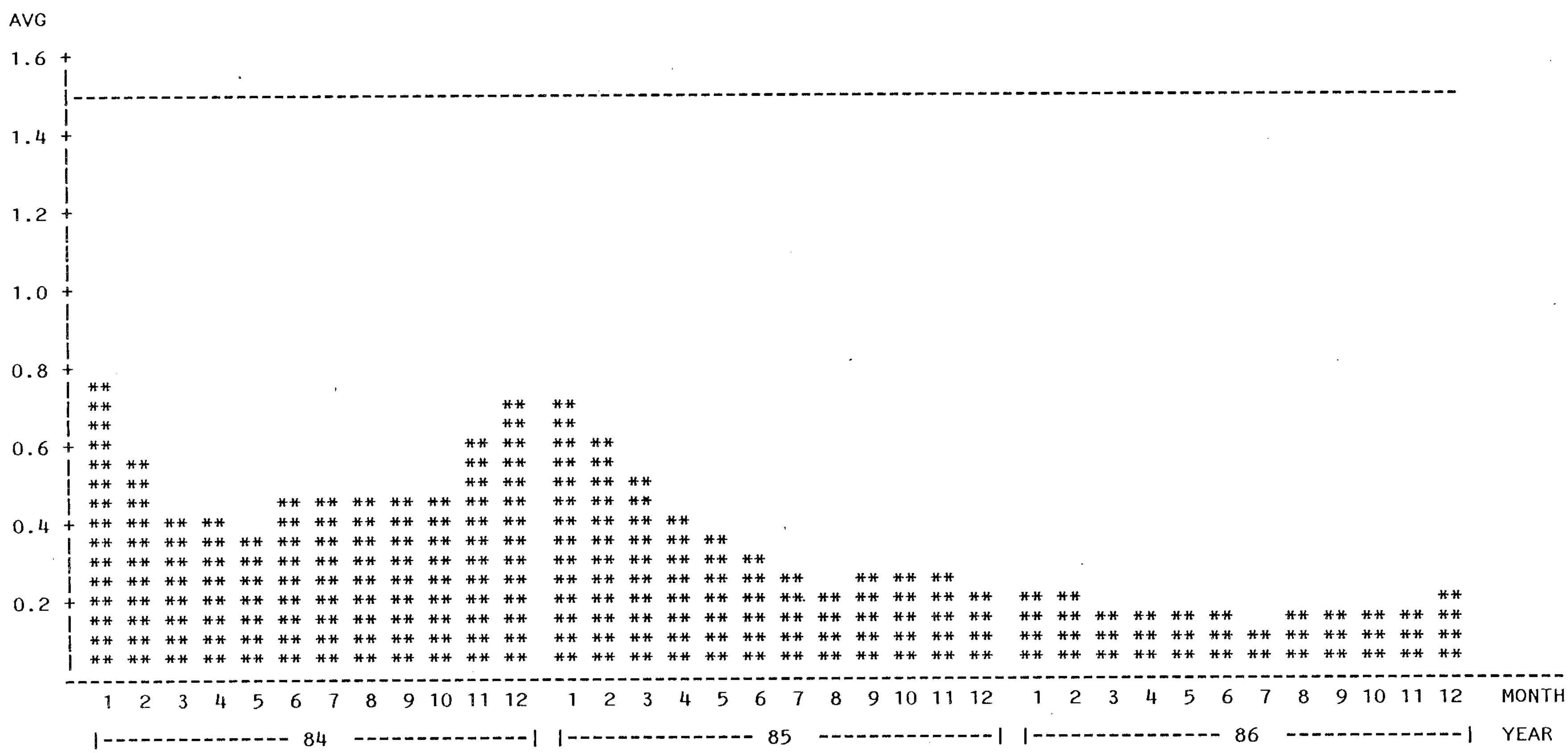


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WEST HAVEN 003

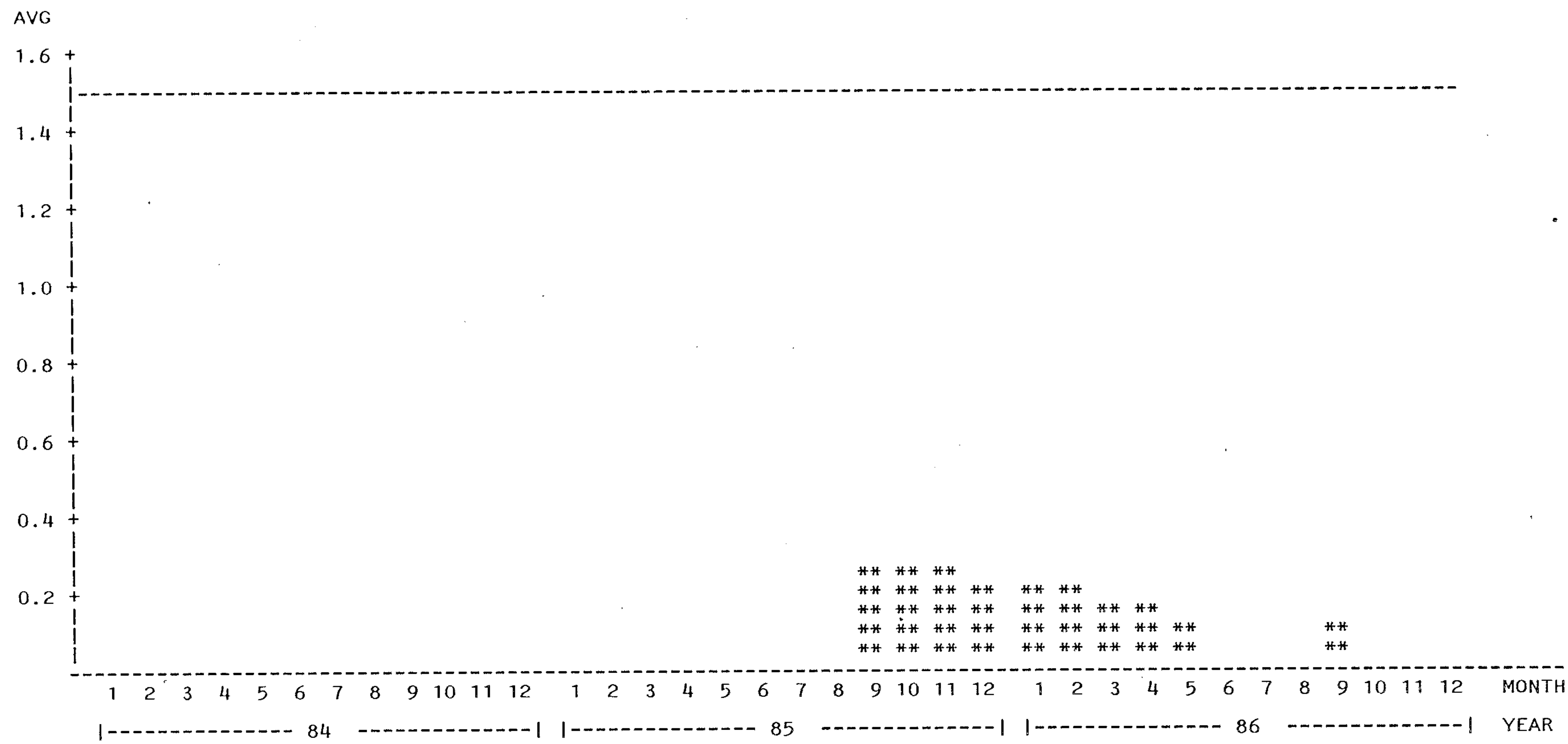


FIGURE C

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: BRIDGEPORT-123

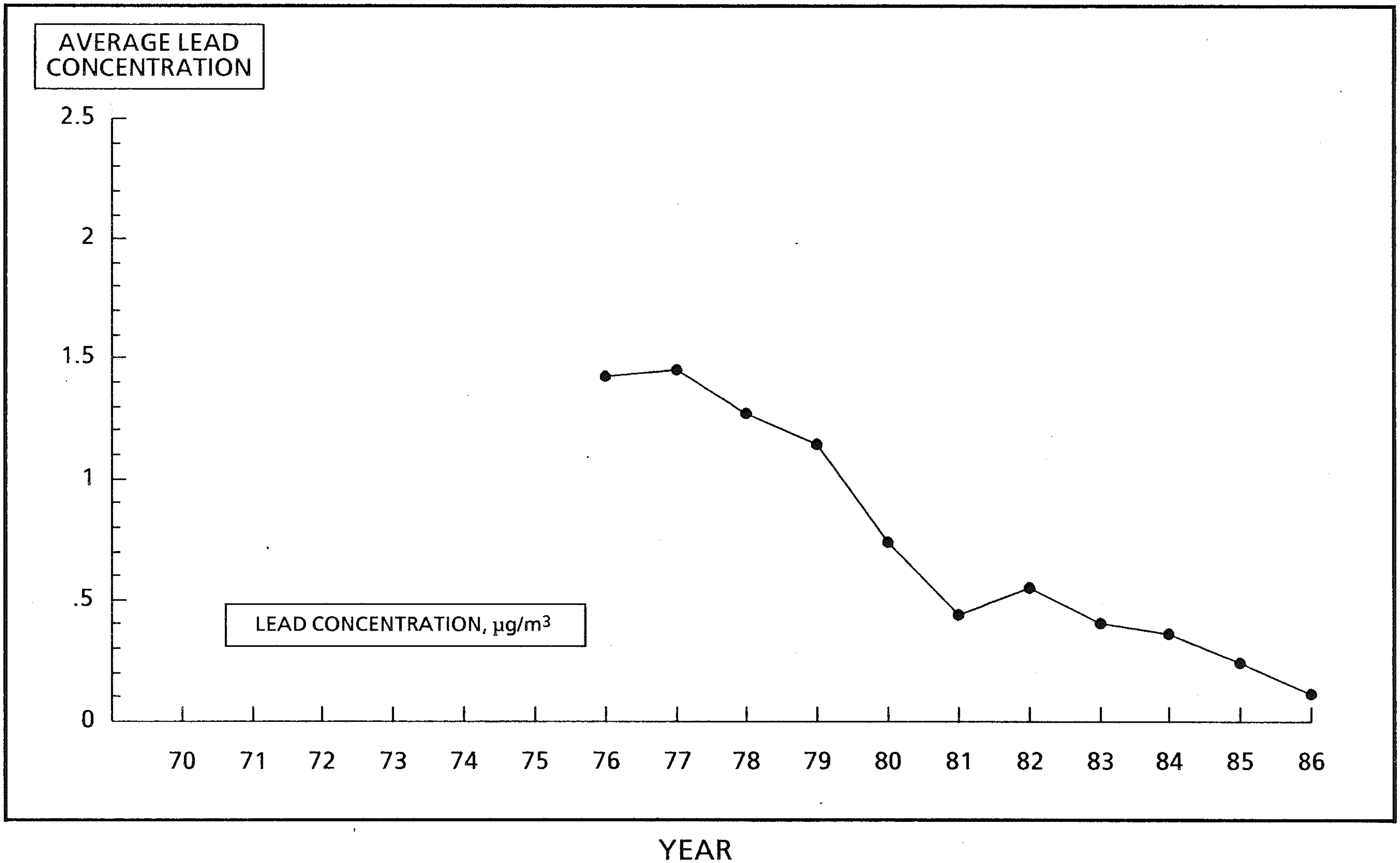


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: BRISTOL-001

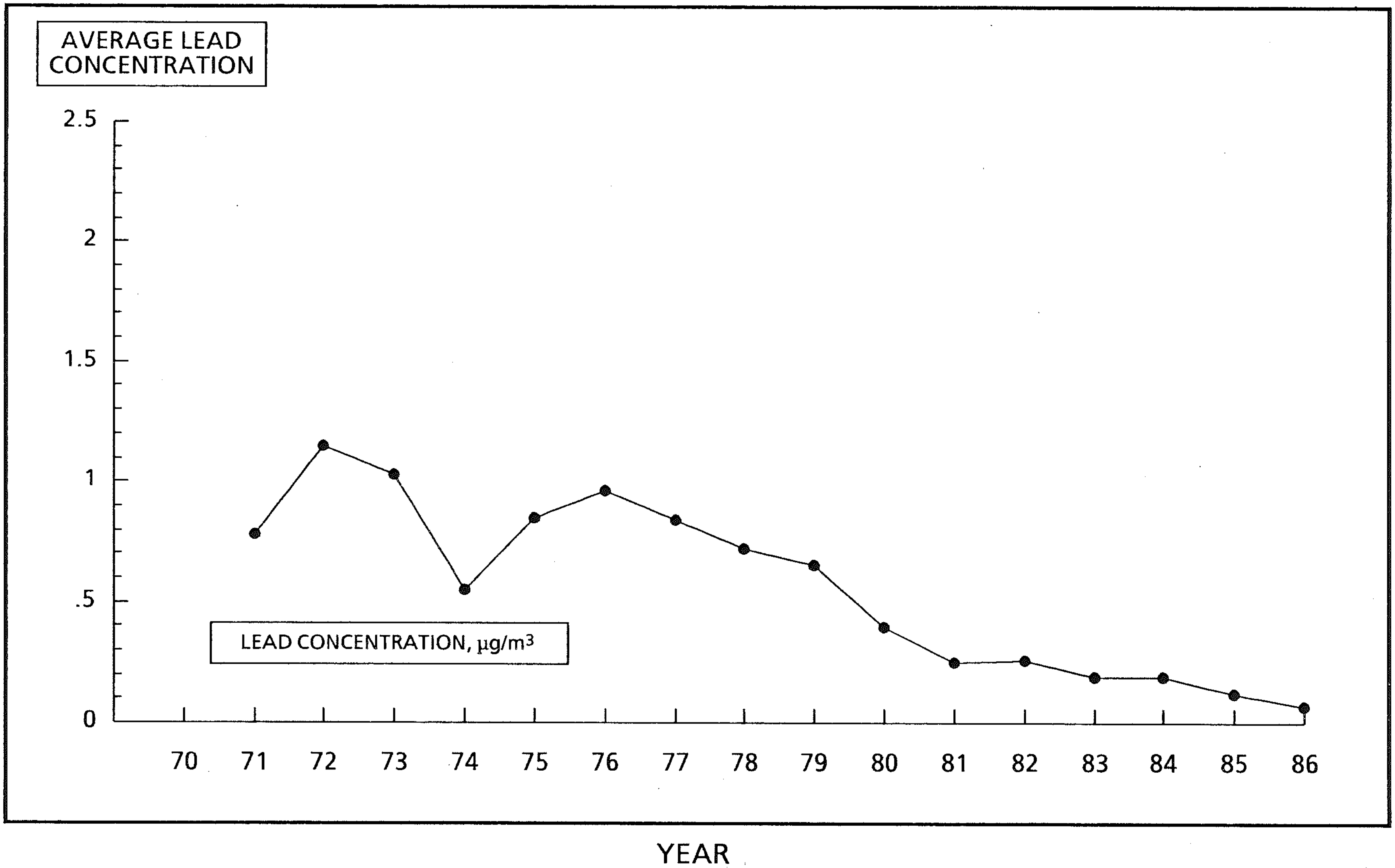


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: MERIDEN-002

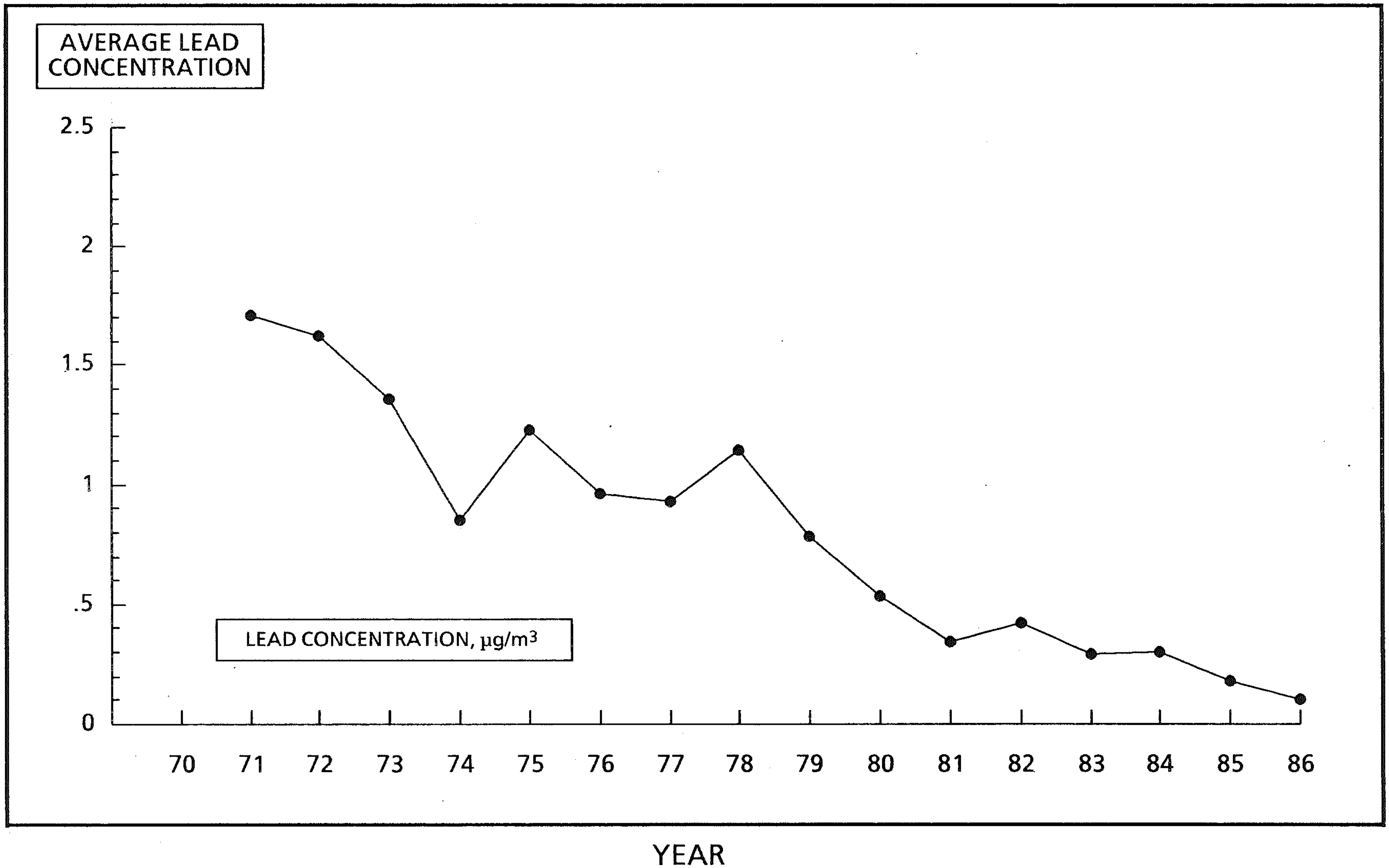


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: MIDDLETOWN-003

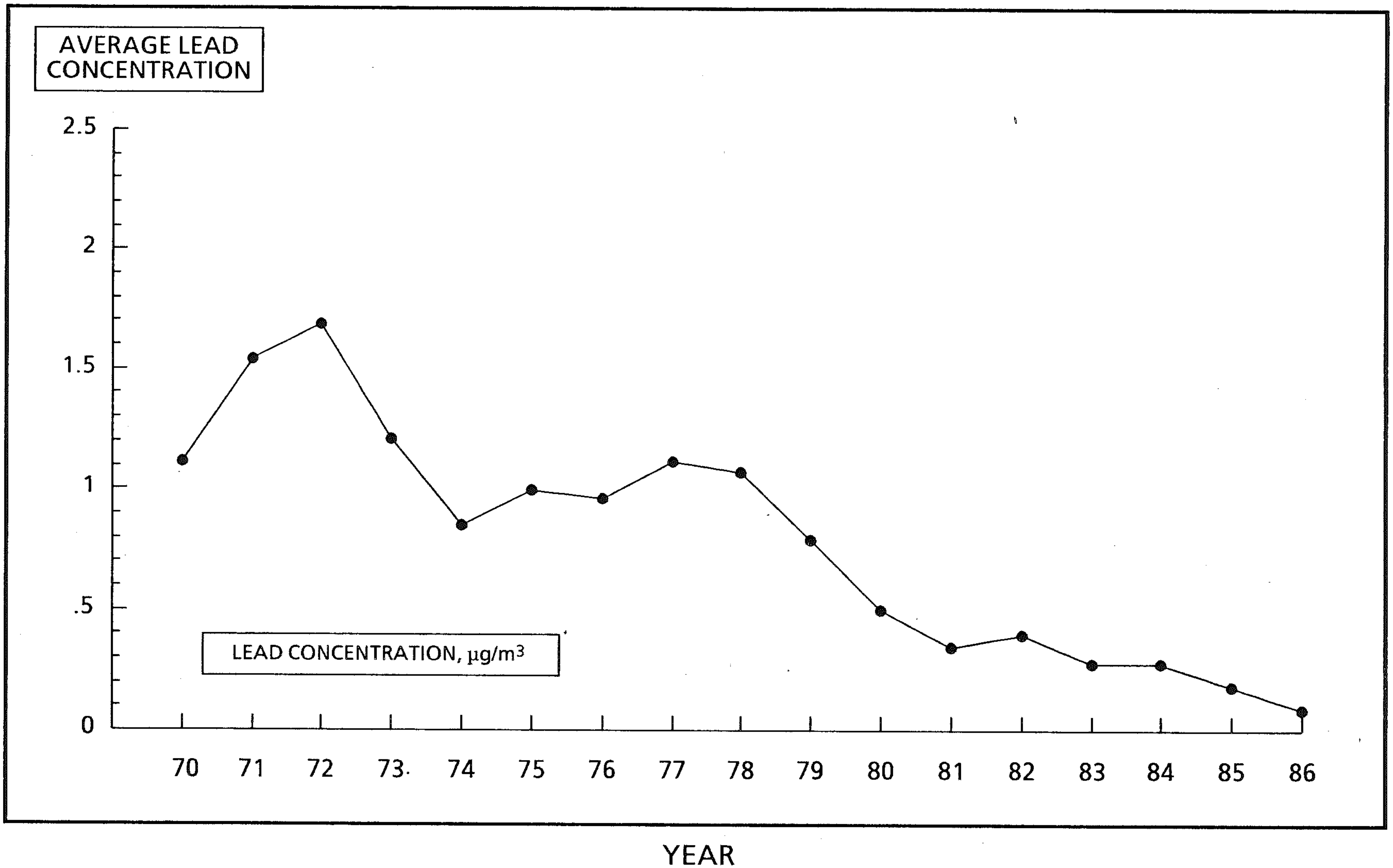


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: WALLINGFORD-001

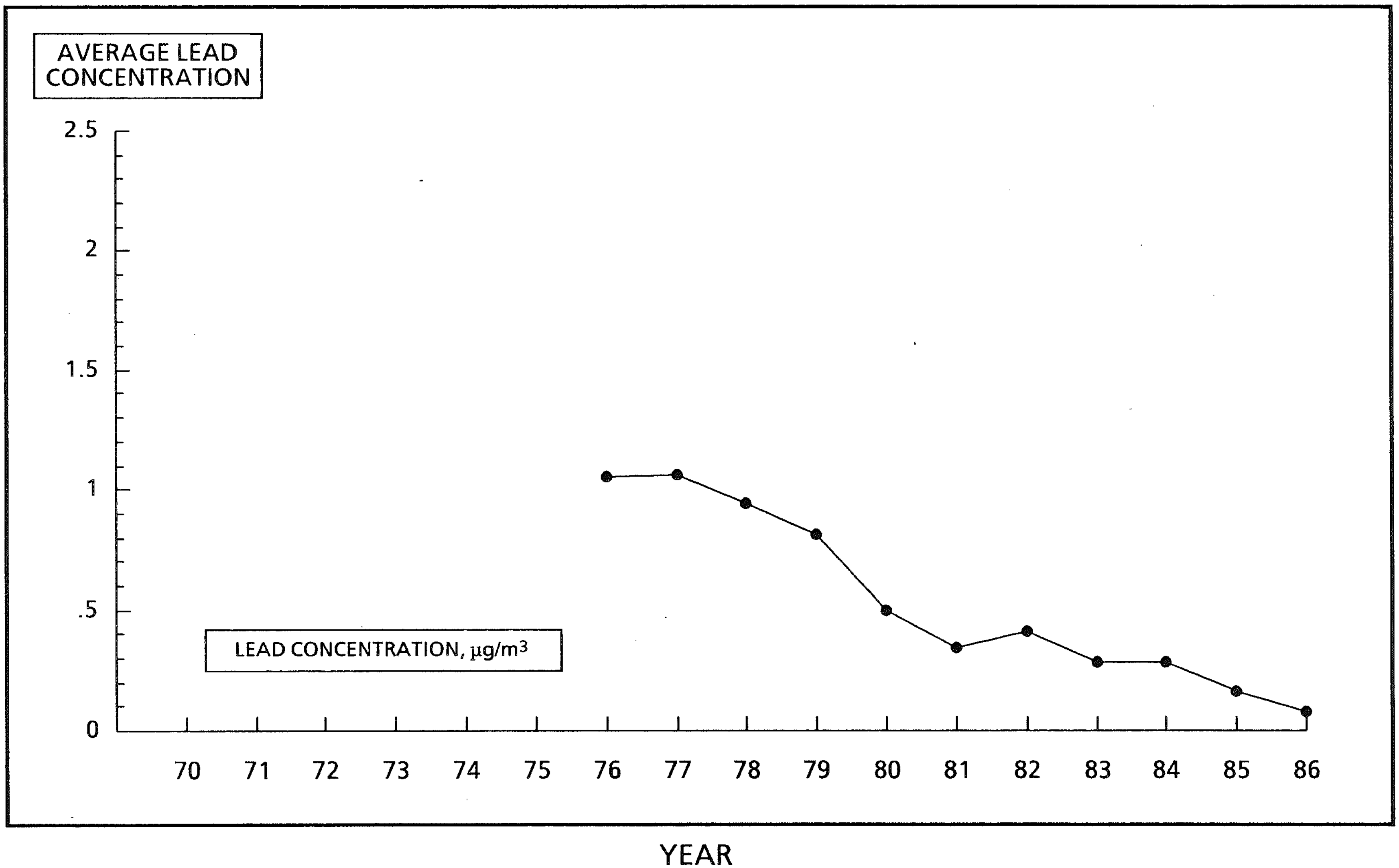


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: WATERBURY-123

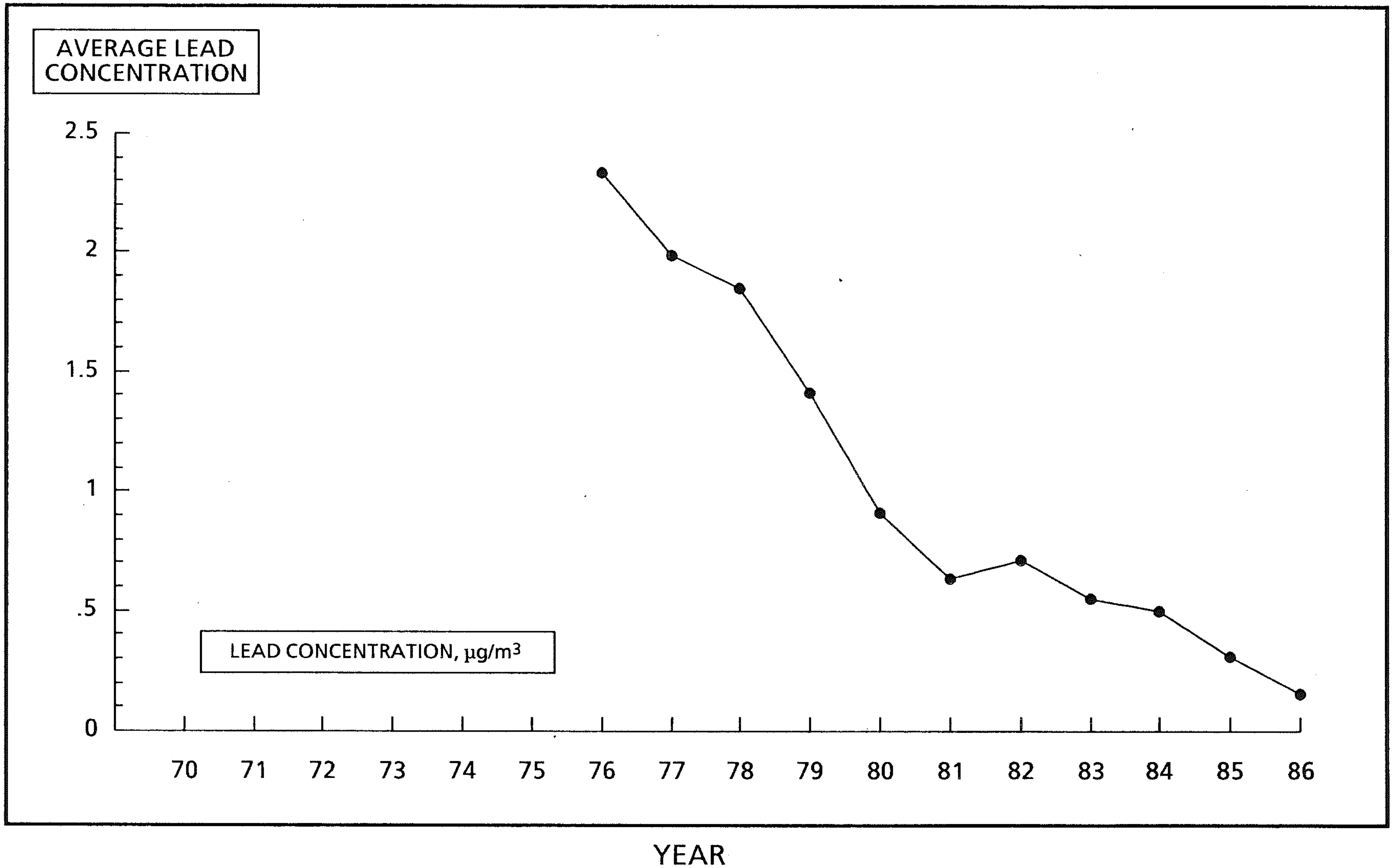


FIGURE D

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: BRIDGEPORT-123

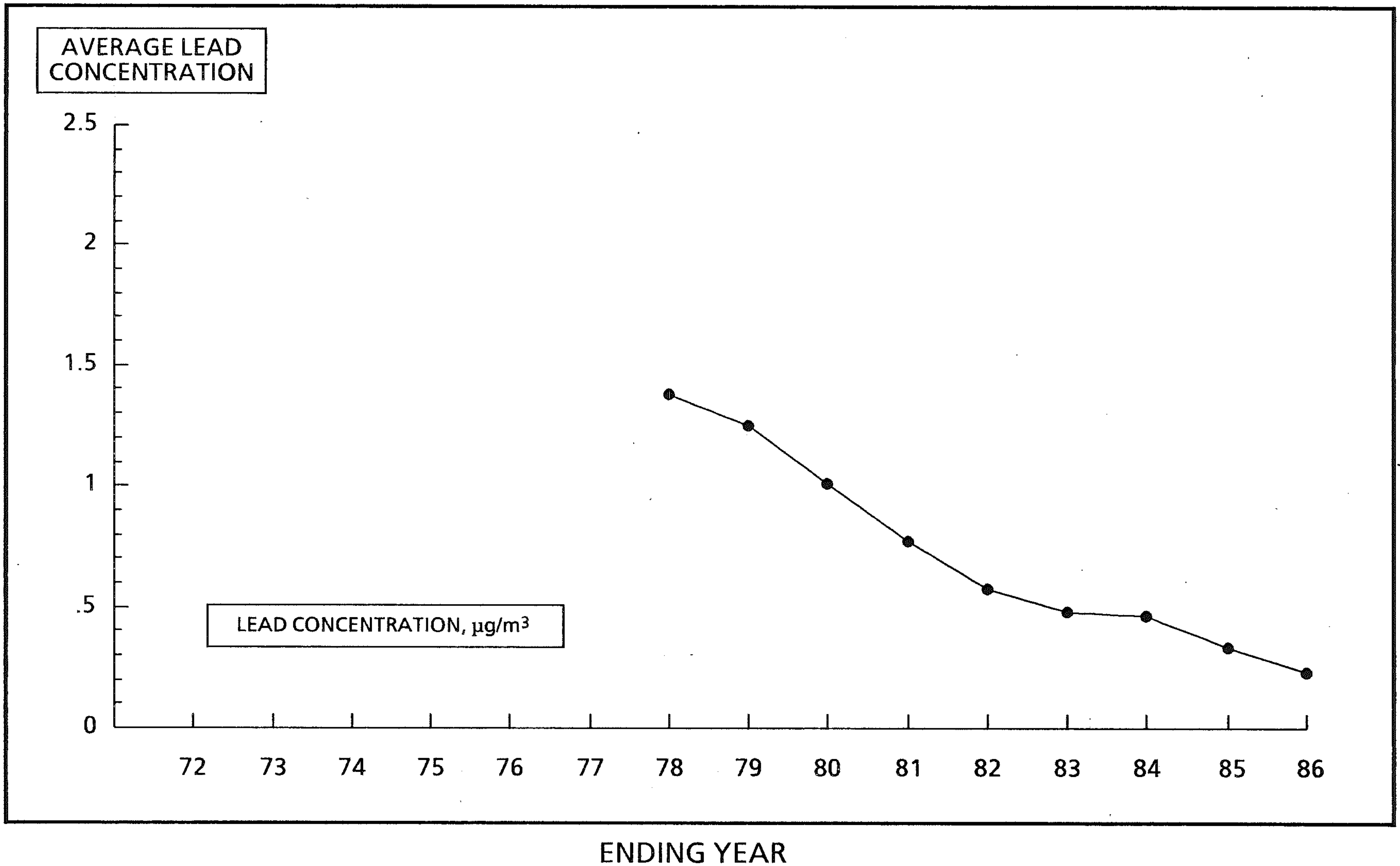


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: BRISTOL-001

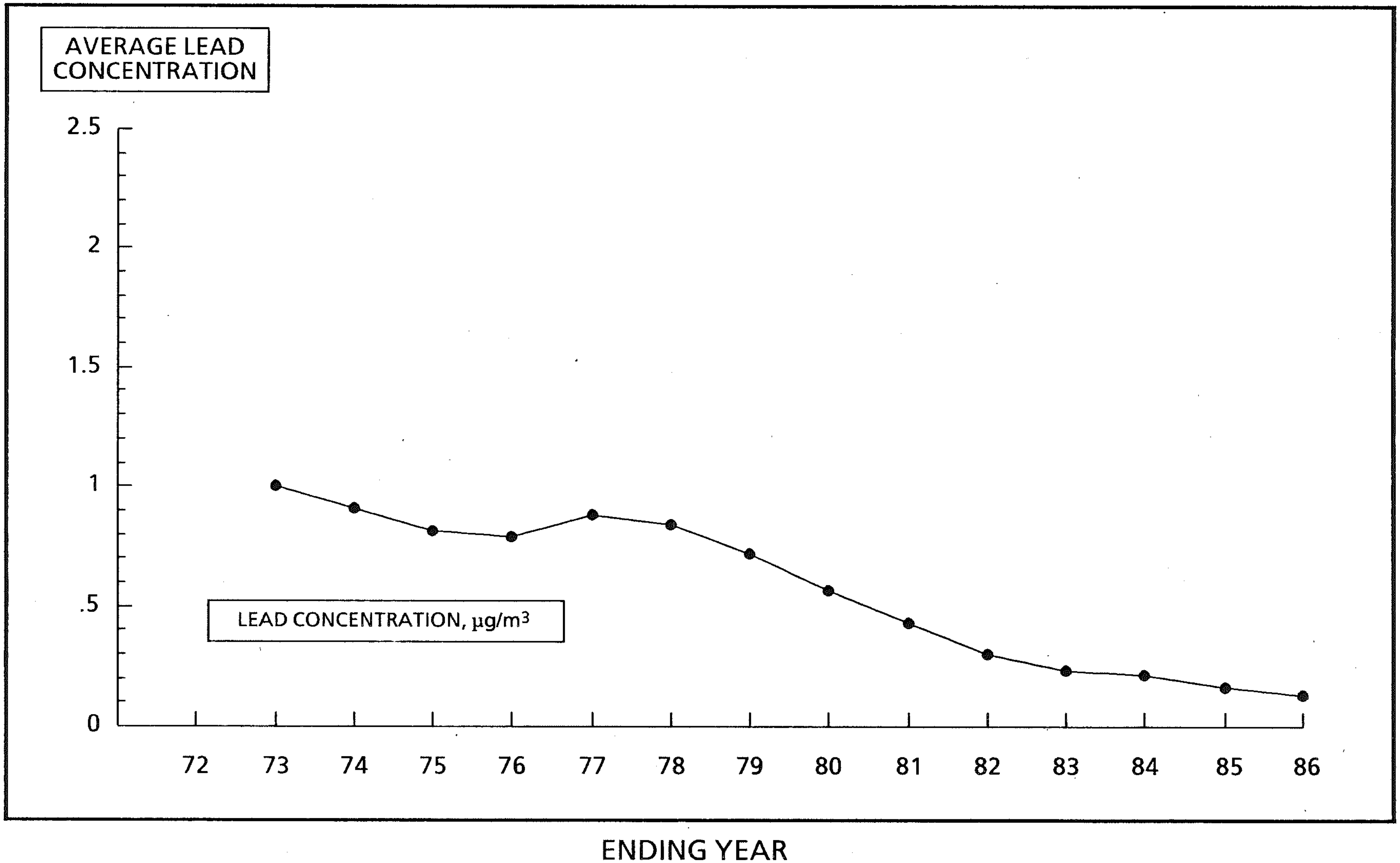


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: MERIDEN-002

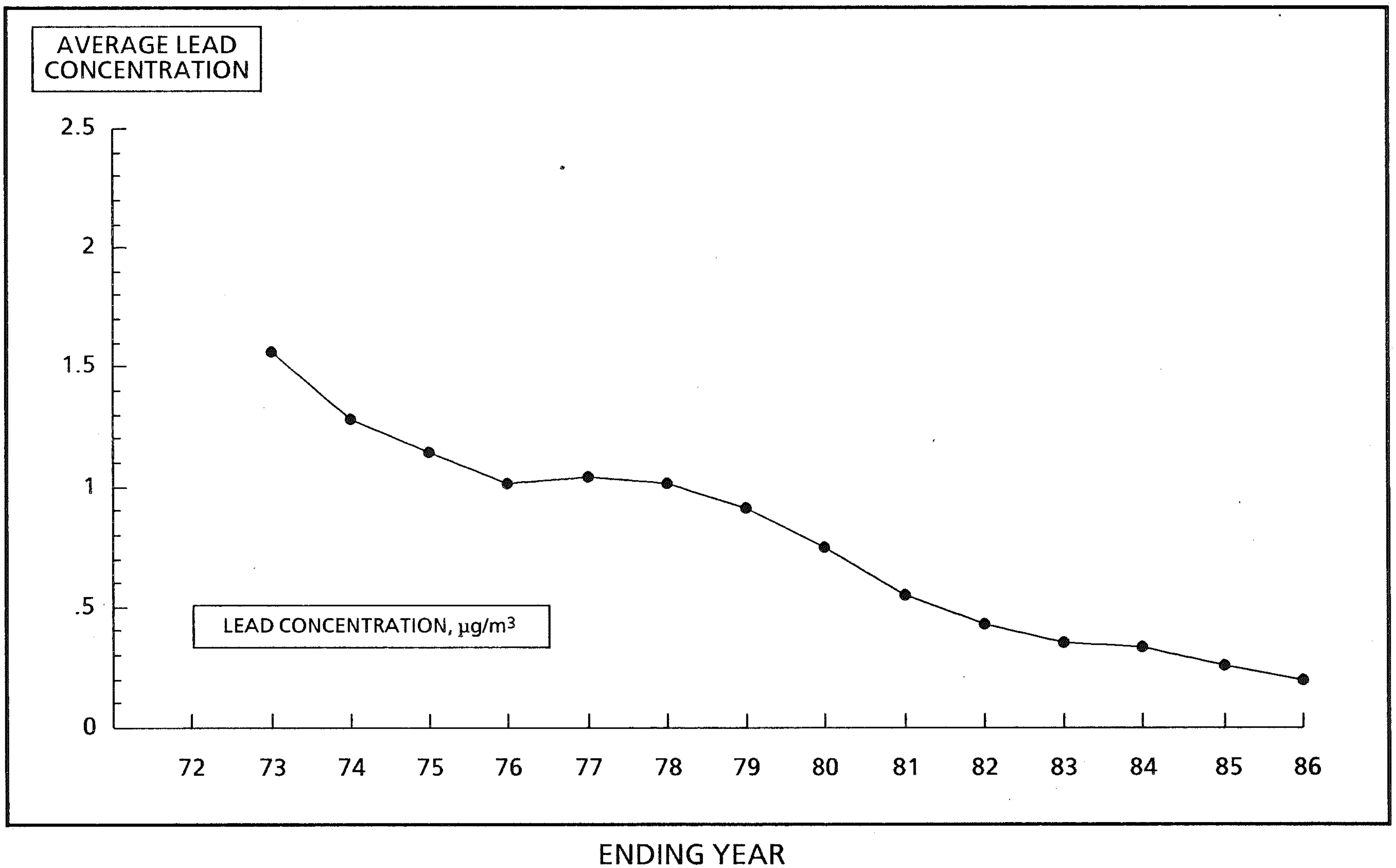


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: MIDDLETOWN-003

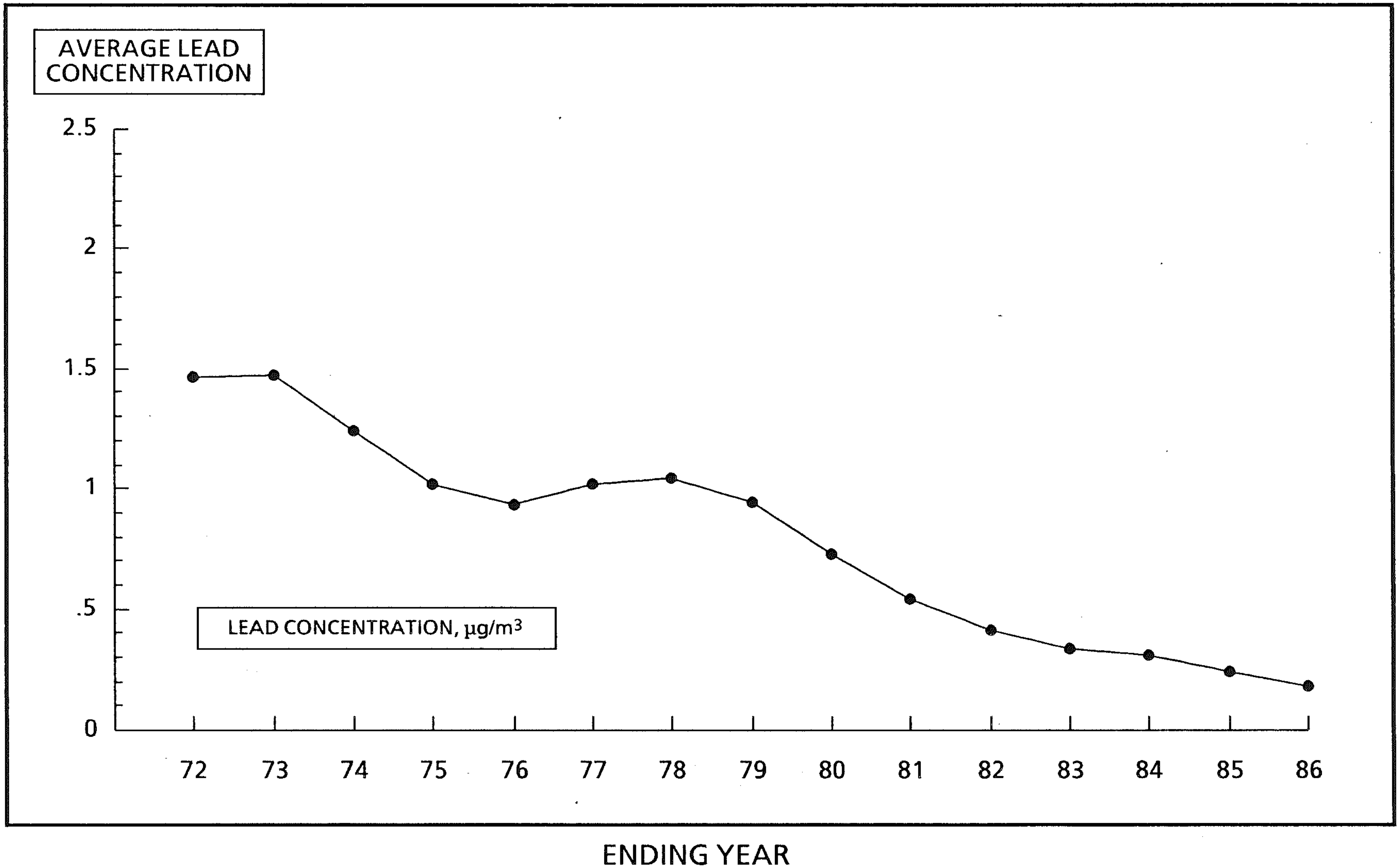


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: WALLINGFORD-001

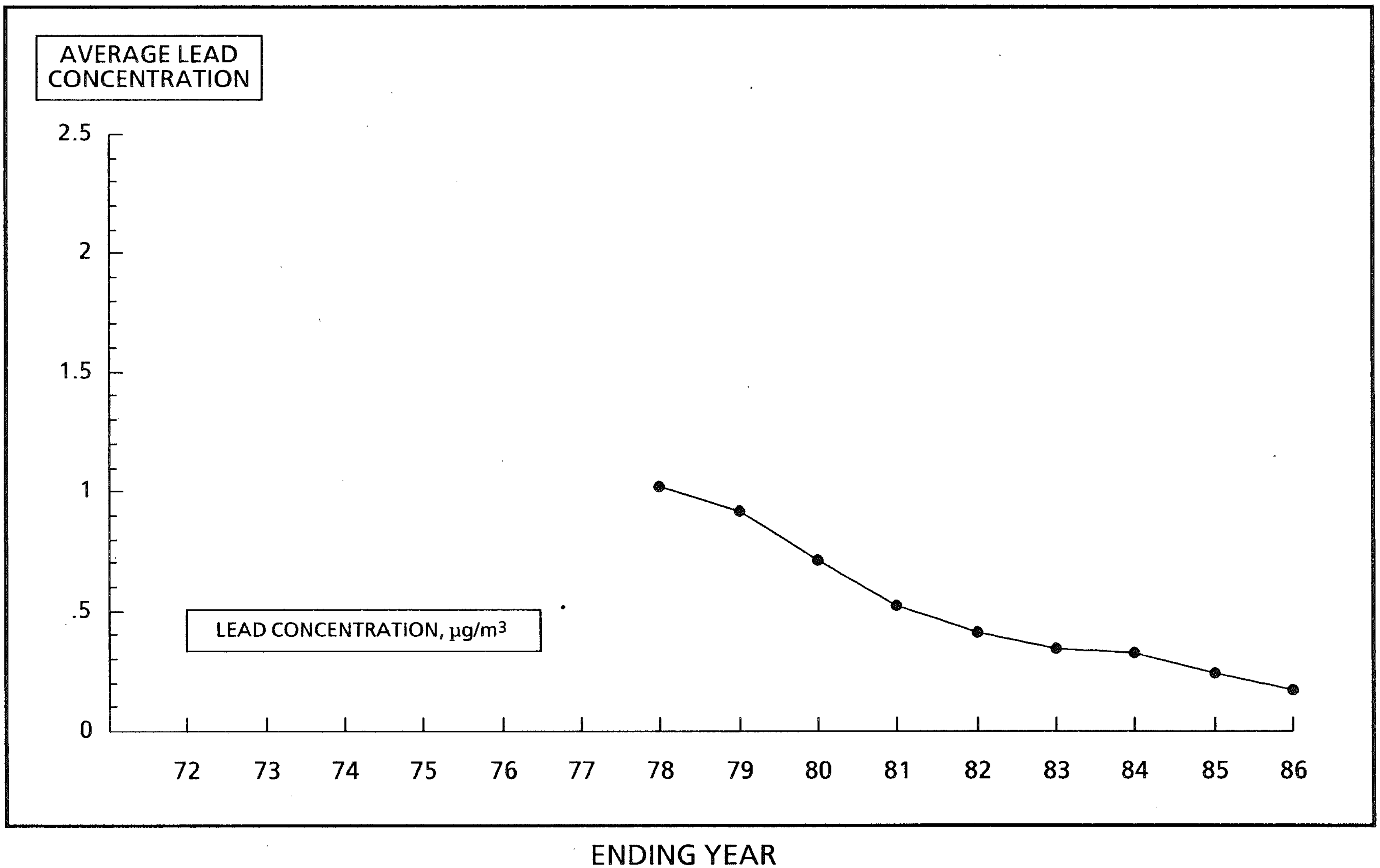
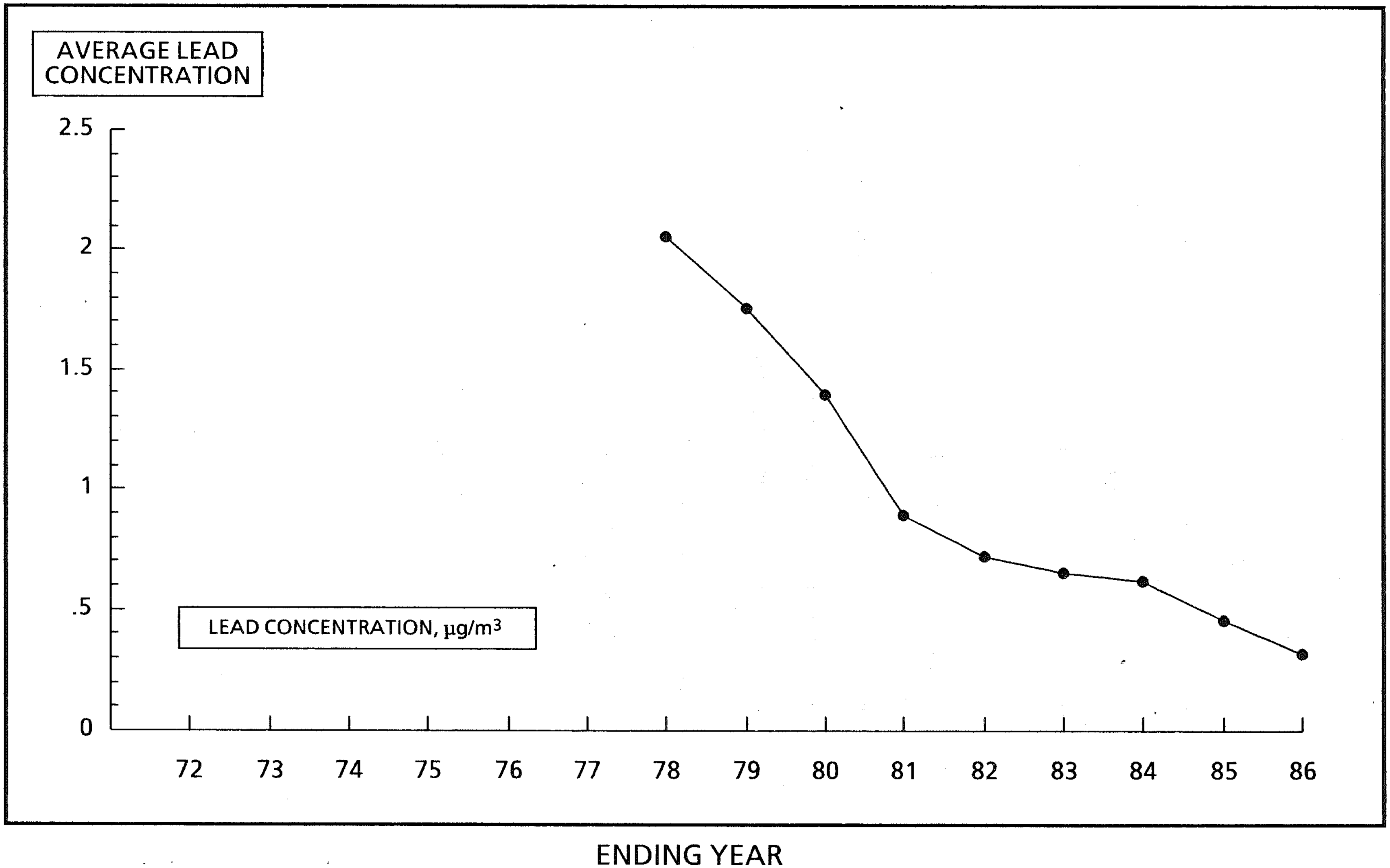


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: WATERBURY-123



VIII. ACID PRECIPITATION

MONITORING PROGRAM

Recently, there has been a growing public concern about the occurrence and effects of atmospheric deposition, most notably acid precipitation or "acid rain." It has become apparent that, in order to address this concern, basic data need to be collected on the chemical properties of precipitation. Recognizing this, the State of Connecticut, through the Department of Environmental Protection, has agreed to cooperate with the Water Resources Division of the United States Geological Survey (USGS) to establish the Connecticut Atmospheric Deposition Monitoring Program.

PROGRAM OBJECTIVES

The program is designed to collect and analyze precipitation on an event basis and has the following objectives:

(1) to determine selected chemical and physical properties of precipitation in Connecticut;

(2) to determine the spatial and temporal distribution of precipitation chemistry in the State;

(3) to determine the relationships between precipitation chemistry and meteorological conditions, such as storm track and air mass movement;

(4) to provide baseline information that can be used to determine trends and estimate loads; and

(5) to use techniques and methodologies consistent with those of the national monitoring networks in order to provide comparative information.

DATA COLLECTION SITES

Data collection sites have been established according to siting criteria used in the National Atmospheric Deposition Program (NADP). Use of these criteria ensures the validity of comparisons made between data which are collected through Connecticut's program and data from other atmospheric deposition programs. Other objectives considered during the siting process were the collection of samples representative of different geographic areas of the State, and the sampling of precipitation representative of long-range transport and not merely local sources. Using these criteria, precipitation sampling sites were established in the towns of Plainfield, Marlborough and Litchfield (Morris Dam). The locations of these sites are shown in Figure 17.

EQUIPMENT

Each site is equipped with an automatic wet-dry sensing type of precipitation collector -- the same type used by the NADP and the National Trends Network (NTN). The collector operates when precipitation wets an electronic sensor, completing an electrical circuit. This activates a motor that opens a lid over the sample container when the precipitation event begins and closes the lid when the precipitation ceases. The purpose of the lid is to retard the loss of samples through evaporation and to prevent contamination by dry fallout.

Each site is also equipped with an automatic rain gage which provides a record of the quantity of rain at 15-minute intervals.

DATA COLLECTION

Samples of precipitation are gathered from the automatic collectors as soon as possible following the end of a precipitation event, in most cases within 24 hours. The samples are immediately tested for acidity through pH measurements. The samples are also tested for specific conductance. This is a measure of the ions (i.e., the dissolved solids) in solution and, therefore, of the pollutant load. The results of this testing for the three precipitation sampling sites are tabulated from 1981 in Tables 28, 29 and 30. Where relevant, the inches of precipitation for certain events in these tables is reported as the water-equivalent. The results of the sample analyses for 1986 are illustrated in Figures 18 through 26.

Samples from selected precipitation events are also sent to a USGS laboratory for further analyses to determine the concentrations of additional chemical constituents, including major anions, cations, nutrients and trace metals.

Through the Connecticut Atmospheric Deposition Monitoring Program, a network capable of providing uninterrupted baseline data on precipitation quality within the State has been developed. Data collected through the program is currently being published monthly by the USGS in its report, Water Resources Conditions in Connecticut. When using the data, one should note that it is specific only to the time and place of its collection.

DISCUSSION OF DATA

Presently, data that has been collected in the initial stages of the study is being analyzed to determine, on a preliminary basis, the distribution and magnitude of atmospheric deposition in Connecticut. Because precipitation chemistry is a function of air quality and climate, both of which fluctuate over time and space, several more years of continuous data collection will be necessary to develop an adequate baseline to determine trends accurately and to more fully define the controlling processes. However, a preliminary evaluation of the data indicates that the precipitation occurring within Connecticut has been chemically affected by man-made contaminants. The data show that 32 percent of all the precipitation events studied to date have had a pH of 4.0 or below. The yearly percentages of these low pH occurrences for the years 1983 through 1986 are 23%, 28%, 42% and 32%, respectively. Further evaluation of the data may provide more information on the source of the contaminants and the effects upon the environment.

It is important to stress that it is presently difficult to forecast statewide trends in the chemical properties of precipitation, or to perform comparative analyses, because of a lack of a large long-term data base. Generally, a 20-year or greater period of record is an acceptable statistical data base. When performing comparative analyses, some hydrologic data bases use 60 years or more of record keeping. Therefore, it should be apparent that data collection under the Connecticut Atmospheric Deposition Monitoring Program must continue until a sufficient period of record has been obtained.

Further information is available from the Water Resources Division, United States Geological Survey, 450 Main Street, Hartford, Connecticut 06103 at (203) 240-3060, or from the Natural Resources Center, Department of Environmental Protection, 165 Capitol Avenue, Hartford, Connecticut 06106 at (203) 566-3540.

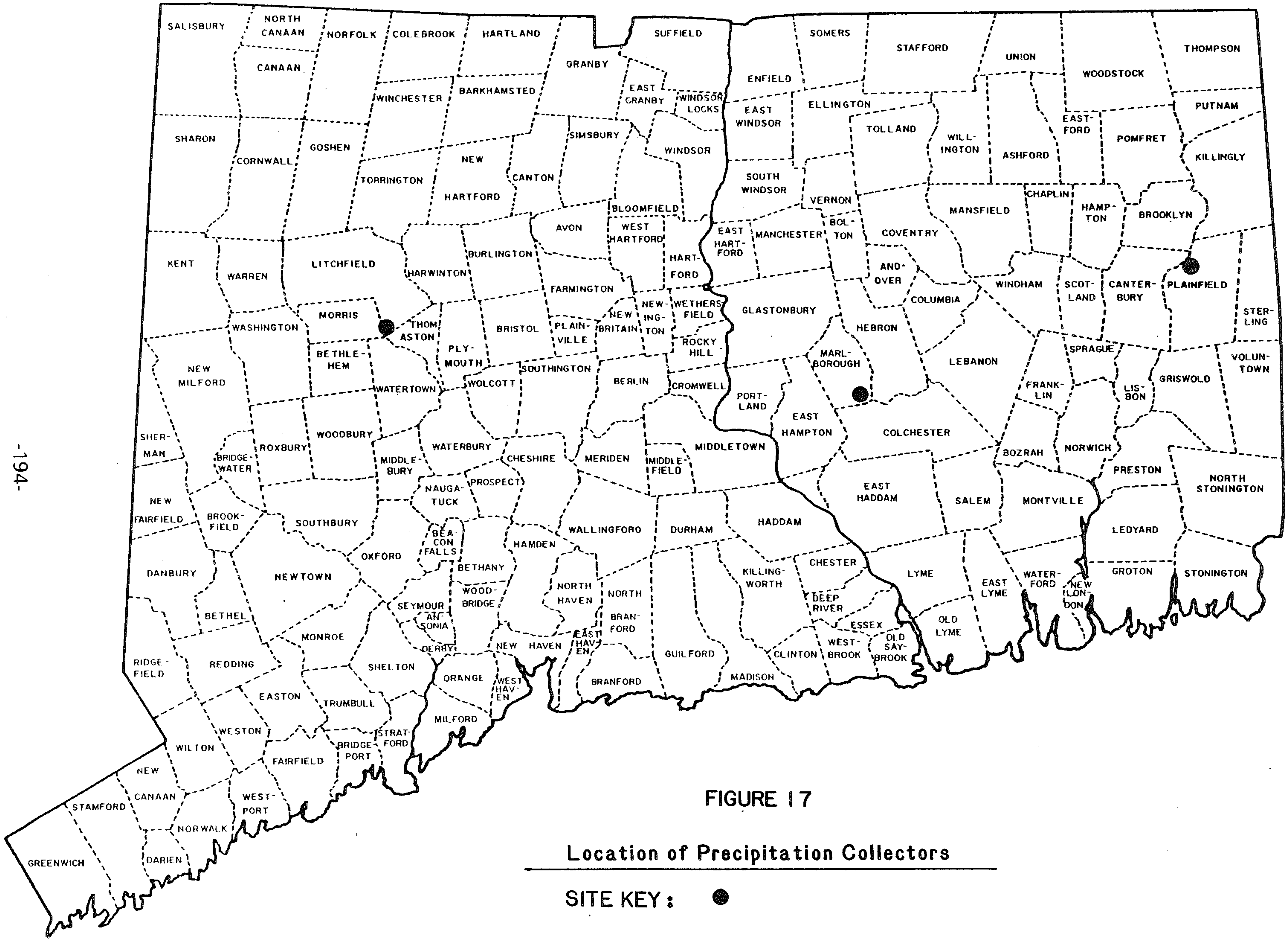


FIGURE 17

Location of Precipitation Collectors

SITE KEY: ●

TABLE 28

ATMOSPHERIC DEPOSITION DATA FOR THE PLAINFIELD SITE

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
1	10/23/81 - 10/27/81	15	4.5	2.30
2	11/14/81 - 11/16/81	15	4.5	1.01
3	12/01/81 - 12/02/81	14	4.5	2.68
4	12/14/81	12	4.4	0.58
5	12/15/81 - 12/16/81	12	4.6	2.90
6	12/27/81 - 12/28/81	51	4.0	0.20
1	01/04/82 - 01/05/82	15	4.8	2.70
2	04/26/82 - 04/27/82	11	4.8	0.99
3	05/29/82 - 05/31/82	18	4.4	1.43
4	06/02/82	5	5.0	2.86
5	06/04/82 - 06/06/82	10	5.1	4.28
6	07/28/82 - 07/29/82	18	4.4	0.11
7	08/09/82	25	4.4	0.96
8	08/09/82 - 08/10/82	31	4.2	0.71
9	11/28/82 - 11/29/82	8	4.8	0.98
10	12/16/82	16	4.9	0.85
1	01/05/83 - 01/06/83	15	4.4	0.49
2	01/13/83	18	4.7	0.78
3	01/22/83 - 01/24/83	8	4.9	1.17
4	01/29/83 - 01/31/83	26	4.2	0.36
5	02/03/83	14	4.7	1.21
6	02/06/83 - 02/07/83	13	4.7	0.44
7	02/11/83 - 02/12/83	6	4.9	0.04
8	02/17/83	17	4.5	1.09
9	03/02/83	26	4.2	0.37
10	03/06/83 - 03/09/83	47	4.0	1.37
11	03/19/83 - 03/21/83	20	4.5	1.91
12	03/27/83 - 03/28/83	22	4.4	1.11
13	04/03/83	32	4.2	0.02
14	04/10/83	13	4.6	2.37
15	04/16/83 - 04/17/83	16	4.4	0.96
16	04/19/83 - 04/20/83	13	4.5	2.84
17	04/24/83	15	4.9	2.42
18	05/31/83	30	4.2	1.47
19	06/04/83	41	4.0	0.99
20	06/27/83 - 06/28/83	68	3.8	1.22
21	07/06/83	27	4.3	0.38
22	07/22/83	79	3.8	0.25
23	07/25/83	38	4.0	0.29
24	08/11/83 - 08/12/83	39	4.0	1.60
25	09/12/83	87	3.7	0.54

TABLE 28, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
26	09/23/83	14	4.7	0.95
27	10/01/83 - 10/02/83	17	4.4	1.33
28	10/12/83 - 10/13/83	4	5.4	1.10
29	10/18/83	45	4.0	0.28
30	10/23/83 - 10/25/83	8	4.8	1.15
31	11/03/83 - 11/04/83	30	4.2	0.60
32	11/10/83	17	4.4	1.08
33	11/15/83 - 11/16/83	8	4.8	2.46
34	11/21/83	14	4.6	0.69
35	11/24/83 - 11/26/83	5	5.2	2.89
36	11/28/83 - 11/29/83	25	4.3	0.97
1	01/10/84 - 01/11/84	24	4.2	0.81*
2	01/18/84 - 01/19/84	52	4.1	0.30*
3	01/24/84	25	4.3	0.32
4	02/03/84 - 02/05/84	24	4.3	1.47
5	02/11/84	37	4.1	0.30
6	02/14/84 - 02/18/84	37	4.9	1.58
7	02/24/84 - 02/25/84	25	4.4	0.81
8	02/28/84 - 03/01/84	11	4.6	1.88
9	03/05/84	54	3.9	0.40
10	03/13/84 - 03/14/84	20	4.2	1.24
11	03/18/84 - 03/19/84	11	4.5	0.42
12	03/21/84	22	4.3	0.58
13	03/28/84 - 03/30/84	10	4.8	1.03
14	04/05/84	17	4.6	1.96
15	04/14/84 - 04/15/84	21	4.5	0.07
16	04/23/84 - 04/24/84	62	3.9	0.12
17	05/03/84 - 05/04/84	48	4.0	1.65
18	05/08/84	40	4.1	0.42
19	05/12/84 - 05/14/84	62	3.9	0.88
20	05/19/84 - 05/21/84	69	3.9	1.05
21	05/27/84 - 05/31/84	21	4.3	5.85
22	05/31/84 - 06/03/84	8	4.8	0.88
23	06/19/84	71	3.8	0.49
24	06/24/84	16	4.5	0.52
25	06/27/84 - 06/29/84	51	4.0	0.75
26	07/09/84	14	4.5	3.50
27	07/16/84	54	3.9	0.62
28	07/19/84	36	4.0	1.07
29	07/23/84	8	5.0	1.08
30	07/27/84	45	4.0	0.41
31	09/04/84	50	3.9	0.66
32	09/12/84	39	4.1	0.19

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 28, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
33	09/15/84	31	4.2	1.07
34	10/01/84 - 10/02/84	12	4.6	2.31
35	10/22/84 - 10/23/84	17	4.5	1.67
36	10/23/84 - 10/24/84	25	4.4	0.15
37	10/26/84 - 10/29/84	38	4.0	1.22
38	11/05/84	6	5.0	0.55
39	11/11/84	8	4.8	1.79
40	11/15/84	55	4.0	0.18
41	11/29/84	17	4.7	0.42
42	12/03/84	21	4.4	0.65
43	12/05/84 - 12/06/84	10	4.7	1.19*
44	12/19/84	40	4.1	0.33
45	12/21/84 - 12/22/84	47	4.0	0.91*
1	01/01/85 - 01/02/85	32	4.1	0.40
2	01/04/85 - 01/05/85	73	4.1	0.23*
3	01/08/85	34	4.2	0.99*
4	01/17/85	40	4.4	0.19*
5	01/19/85 - 01/20/85	54	4.0	0.06*
6	02/01/85 - 02/02/85	31	4.2	1.88*
7	02/05/85 - 02/06/85	23	4.3	2.01*
8	03/04/85 - 03/05/85	53	4.0	3.67*
9	03/07/85 - 03/08/85	35	4.1	0.39
10	03/12/85	32	4.2	1.09
11	03/18/85 - 03/19/85	82	3.9	0.11
12	03/31/85 - 04/01/85	32	4.2	0.53
13	04/07/85 - 04/08/85	32	4.3	0.32
14	04/14/85 - 04/15/85	96	3.8	0.03
15	04/22/85	70	3.8	0.05
16	04/26/85 - 04/28/85	135	3.6	0.10
17	05/02/85 - 05/06/85	25	4.4	2.31
18	05/18/85 - 05/19/85	11	5.1	0.06
19	05/27/85 - 05/28/85	20	4.4	1.31
20	06/01/85	14	4.6	0.39
21	06/05/85	24	4.3	0.80
22	06/08/85	98	3.7	0.06
23	06/16/85 - 06/17/85	37	4.1	1.15
24	06/24/85	36	4.1	0.39
25	06/25/85 - 06/29/85	15	4.5	1.15
26	07/03/85	93	3.7	0.16
27	07/06/85 - 07/07/85	41	4.1	0.25
28	07/09/85	74	3.7	0.33
29	07/12/85 - 07/14/85	113	3.6	0.35
30	07/15/85	59	3.9	0.35

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 28, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
31	07/21/85	80	3.8	1.62
32	07/26/85 - 07/27/85	20	4.3	1.30
33	07/31/85 - 08/01/85	65	3.8	2.19
34	08/07/85 - 08/08/85	29	4.1	0.24
35	08/15/85	74	3.8	0.11
36	08/25/85 - 08/26/85	13	4.4	1.51
37	08/30/85 - 08/31/85	49	3.9	1.30
38	09/04/85 - 09/05/85	58	3.9	0.66
39	09/06/85 - 09/08/85	43	4.0	0.99
40	09/09/85 - 09/10/85	77	3.8	0.44
41	09/24/85	6	5.4	0.41
42	10/03/85 - 10/04/85	87	3.9	0.26
43	10/05/85	21	4.4	0.53
44	10/13/85 - 10/15/85	51	4.1	0.41
45	10/19/85	99	3.6	0.19
46	10/25/85	13	4.6	0.22
47	11/05/85 - 11/06/85	9	4.7	2.61
48	11/11/85 - 11/12/85	44	4.0	0.75
49	11/14/85	50	4.0	0.19
50	11/16/85 - 11/17/85	6	4.8	1.23
51	11/22/85 - 11/24/85	29	4.2	0.56
52	11/26/85 - 11/27/85	35	4.1	0.68
53	11/28/85 - 11/30/85	28	4.2	0.82
54	12/11/85	54	3.9	0.50
55	12/13/85	29	4.3	0.14
56	12/20/85 - 12/23/85	46	4.0	0.70*
1	01/03/86	16	4.8	0.70
2	01/05/86	28	4.4	0.40
3	01/19/86 - 01/20/86	11	4.9	0.60
4	01/25/86 - 01/27/86	13	5.1	3.11*
5	02/01/86 - 02/02/86	47	4.0	0.78*
6	02/04/86 - 02/05/86	38	4.6	0.42*
7	02/07/86 - 02/08/86	39	4.4	0.21*
8	02/11/86	23	4.3	0.14*
9	02/14/86 - 02/18/86	69	3.8	1.07
10	02/21/86	45	4.1	0.55
11	03/08/86 - 03/09/86	66	3.9	0.22
12	03/13/86 - 03/15/86	22	4.4	2.41
13	03/19/86	103	3.8	0.18
14	03/27/86	42	4.2	0.30
15	04/06/86 - 04/08/86	60	4.0	0.63
16	04/14/86 - 04/16/86	67	4.1	0.07
17	04/21/86	34	4.3	0.25

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 28, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
18	04/22/86 - 04/23/86	44	4.1	0.23
19	04/25/86 - 04/27/86	17	4.8	0.31
20	05/07/86 - 05/08/86	79	3.7	0.13
21	05/17/86	75	3.9	0.21
22	05/20/86	15	6.1	0.11
23	05/21/86 - 05/22/86	9	5.3	0.31
24	05/23/86 - 05/24/86	35	4.1	1.77
25	05/29/86	52	4.2	0.14
26	06/01/86	62	4.0	0.25
27	06/09/86	46	4.0	1.83
28	06/12/86 - 06/13/86	37	4.1	0.99
29	06/19/86 - 06/20/86	71	3.9	0.08
30	06/24/86	139	3.6	0.16
31	07/02/86	12	4.6	1.44
32	07/12/86 - 07/13/86	37	4.1	1.55
33	07/26/86 - 07/27/86	22	4.3	1.28*
34	07/29/86 - 07/30/86	138	3.5	0.10
35	08/01/86 - 08/02/86	16	4.5	0.42
36	08/07/86 - 08/08/86	35	4.1	1.35
37	08/08/86 - 08/09/86	105	3.7	0.17
38	08/11/86	13	4.6	0.90
39	08/17/86 - 08/18/86	22	4.4	0.40
40	08/21/86	5	4.9	0.60
41	08/23/86 - 08/24/86	46	4.0	0.18
42	08/28/86	39	4.1	0.23
43	09/16/86	56	4.0	0.55
44	09/21/86 - 09/24/86	150	3.6	0.22
45	10/02/86	32	4.2	0.25
46	10/03/86 - 10/05/86	38	4.1	0.98
47	10/14/86	9	4.7	0.75
48	10/26/86 - 10/27/86	22	4.4	0.73
49	11/05/86 - 11/06/86	18	4.5	0.60
50	11/08/86 - 11/09/86	11	4.7	1.27
51	11/11/86	10	4.9	0.56
52	11/19/86 - 11/20/86	14	4.9	0.65*
53	11/20/86 - 11/21/86	7	5.2	1.74
54	11/26/86 - 11/27/86	18	4.6	1.18
55	12/02/86 - 12/03/86	11	5.0	1.90
56	12/08/86 - 12/09/86	20	4.5	0.46
57	12/12/86	15	4.7	0.36*
58	12/18/86 - 12/19/86	10	4.9	2.37
59	12/24/86 - 12/25/86	14	4.6	0.86
60	12/30/86	48	4.1	0.27*

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 29

ATMOSPHERIC DEPOSITION DATA FOR THE MORRIS DAM SITE

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
1	12/16/82	22	4.5	1.18
1	01/05/83 - 01/06/83	18	4.4	0.64
2	01/10/83 - 01/11/83	6	4.9	2.39
3	01/23/83	13	4.5	1.45
4	02/02/83 - 02/03/83	19	4.4	1.89
5	02/06/83 - 02/07/83	50	4.0	0.45*
6	02/11/83 - 02/12/83	9	4.9	1.30*
7	02/17/83	46	4.0	0.21
8	03/02/83	22	4.3	0.27
9	03/07/83 - 03/09/83	37	4.1	1.22
10	03/19/83 - 03/21/83	14	4.5	1.29
11	03/27/83 - 03/28/83	18	4.4	1.29
12	04/03/83	11	4.7	1.07
13	04/10/83	9	4.6	2.70
14	04/16/83 - 04/17/83	10	4.5	2.61
15	04/19/83 - 04/20/83	23	4.3	1.27
16	04/24/83	16	4.5	1.35
17	05/15/83 - 05/16/83	35	4.1	0.87
18	05/29/83 - 05/30/83	39	4.1	0.81
19	06/04/83	49	3.9	1.39
20	06/28/83	58	3.9	1.71
21	07/05/83	67	3.9	1.54
22	07/25/83	46	4.1	0.75
23	08/11/83 - 08/12/83	49	3.9	1.60
24	09/12/83	65	3.8	0.24
25	09/23/83	20	4.5	0.94
26	10/01/83 - 10/02/83	9	4.6	1.18
27	10/12/83 - 10/13/83	6	4.9	3.34
28	10/18/83	30	4.1	0.33
29	10/23/83 - 10/25/83	9	4.8	2.32
30	11/03/83 - 11/04/83	80	3.8	0.11
31	11/10/83	40	4.2	0.94
32	11/15/83 - 11/16/83	10	4.6	1.64
33	11/21/83	14	4.6	0.57
34	11/24/83 - 11/25/83	21	4.5	1.45
35	11/28/83 - 11/29/83	24	4.3	0.71
36	12/06/83	32	4.2	1.04
37	12/12/83 - 12/14/83	26	4.5	3.41
1	01/10/84 - 01/11/84	12	4.5	0.47*

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 29, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
2	01/18/84 - 01/19/84	45	4.0	0.21*
3	01/24/84	34	4.2	0.45
4	01/30/84 - 01/31/84	22	4.3	0.38*
5	02/03/84 - 02/05/84	41	4.0	0.69
6	02/11/84	43	4.0	0.48
7	02/14/84 - 02/16/84	23	4.7	1.53
8	02/24/84 - 02/25/84	80	3.8	0.86
9	02/28/84 - 03/01/84	10	4.6	1.34
10	03/05/84 - 03/06/84	25	4.2	0.53
11	03/18/84 - 03/19/84	30	4.1	0.52
12	03/21/84	24	4.3	0.65
13	03/28/84 - 03/30/84	10	4.8	1.61*
14	04/05/84	25	4.4	2.79
15	04/13/84 - 04/16/84	32	4.2	1.25
16	04/23/84 - 04/24/84	17	4.6	0.55
17	05/03/84 - 05/04/84	28	4.2	1.24
18	05/08/84	34	4.2	0.99
19	05/12/84 - 05/14/84	55	3.9	0.77
20	05/19/84 - 05/21/84	78	3.8	0.21
21	05/25/84	19	4.4	0.88
22	05/27/84 - 05/31/84	13	4.5	6.11
23	05/31/84 - 06/03/84	5	5.0	0.74
24	06/24/84 - 06/25/84	20	4.3	0.87
25	06/27/84 - 07/01/84	39	4.0	0.60
26	07/09/84	24	4.2	0.23
27	07/16/84	62	3.9	0.71
28	07/19/84	52	4.0	0.53
29	07/27/84	18	4.4	0.70
30	09/04/84	50	3.9	0.80
31	09/12/84	20	4.4	0.22
32	10/01/84 - 10/02/84	8	4.8	0.51
33	10/22/84 - 10/23/84	20	4.4	0.91
34	10/23/84 - 10/24/84	55	4.4	0.07
35	10/26/84 - 10/29/84	61	3.8	0.63
36	11/05/84	6	5.0	0.96
37	11/29/84	15	4.6	0.54
38	12/03/84	33	4.4	0.54
39	12/05/84 - 12/06/84	10	5.0	0.46
40	12/19/84	39	4.1	0.32
41	12/21/84 - 12/22/84	46	3.9	0.33
1	01/01/85 - 01/02/85	31	4.1	0.28
2	01/08/85	24	4.3	0.10*
3	01/17/85	11	4.7	0.29*

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 29, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
4	01/19/85 - 01/20/85	66	4.1	0.13*
5	01/31/85	57	3.9	0.05*
6	02/01/85 - 02/02/85	31	4.2	0.30*
7	02/05/85 - 02/06/85	28	4.2	0.64*
8	02/12/85	14	4.5	1.38
9	03/04/85 - 03/05/85	60	3.9	0.69*
10	03/12/85	30	4.2	1.23
11	03/31/85 - 04/01/85	38	4.1	0.30
12	04/07/85 - 04/08/85	45	4.1	0.30
13	04/14/85 - 04/15/85	50	4.1	0.06
14	04/19/85	27	4.2	0.10
15	04/22/85	53	4.0	0.65
16	04/26/85 - 04/28/85	38	3.6	0.04
17	05/02/85 - 05/06/85	25	4.3	2.37
18	05/18/85 - 05/19/85	16	4.6	0.30
19	05/27/85 - 05/28/85	21	4.4	1.56
20	06/01/85	16	4.5	1.20
21	06/05/85	25	4.3	0.77
22	06/08/85	71	3.9	0.22
23	06/12/85	55	3.9	0.21
24	06/16/85 - 06/17/85	28	4.2	1.02
25	06/18/85	59	3.9	0.07
26	06/24/85	96	3.7	0.11
27	06/25/85 - 06/29/85	27	4.2	0.96
28	07/03/85	80	3.7	0.25
29	07/06/85 - 07/07/85	30	4.2	0.47
30	07/09/85	65	3.8	0.29
31	07/12/85 - 07/14/85	67	3.8	0.77
32	07/15/85	83	3.8	0.15
33	07/21/85	108	3.7	1.44
34	07/26/85 - 07/27/85	21	4.3	1.27
35	07/31/85 - 08/01/85	90	3.7	1.35
36	08/11/85	70	3.8	0.19
37	08/25/85 - 08/26/85	17	4.2	2.48
38	08/30/85 - 08/31/85	65	3.8	0.54
39	09/04/85 - 09/05/85	22	4.3	1.03
40	09/06/85 - 09/08/85	23	4.3	0.50
41	09/09/85 - 09/10/85	33	4.1	1.36
42	09/24/85	8	4.9	0.54
43	09/27/85	12	5.0	3.68
44	10/03/85 - 10/04/85	35	4.1	0.47
45	10/05/85	32	4.1	1.30
46	10/13/85 - 10/15/85	68	3.8	0.36
47	10/19/85	89	3.7	0.11

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 29, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
48	10/25/85	19	4.4	0.27
49	11/05/85 - 11/06/85	6	4.9	1.06
50	11/11/85 - 11/12/85	43	4.0	1.01
51	11/14/85	54	4.0	0.41
52	11/16/85 - 11/17/85	7	4.7	1.40
53	11/22/85 - 11/24/85	13	4.5	0.31
54	11/26/85 - 11/27/85	53	3.9	0.70
55	11/28/85 - 11/30/85	19	4.3	0.97
56	12/13/85	24	4.3	0.21
57	12/20/85 - 12/23/85	41	4.1	0.39*
1	01/03/86 - 01/05/86	29	4.2	0.62
2	01/19/86 - 01/20/86	18	4.7	0.53
3	01/25/86 - 01/27/86	23	4.6	3.74
4	02/01/86 - 02/02/86	73	3.8	0.54*
5	02/04/86 - 02/05/86	51	4.3	0.35*
6	02/07/86 - 02/08/86	46	4.2	0.34*
7	02/14/86 - 02/18/86	46	4.1	1.26
8	02/19/86 - 02/20/86	35	4.1	0.47*
9	02/21/86	42	4.1	0.54
10	03/13/86 - 03/15/86	22	4.4	2.17
11	03/19/86	74	4.0	0.44
12	03/27/86	34	4.2	0.35
13	04/06/86 - 04/08/86	70	3.9	0.70
14	04/14/86 - 04/16/86	43	4.1	0.22
15	04/21/86	45	4.0	0.47
16	04/22/86 - 04/23/86	48	4.1	0.32
17	04/25/86 - 04/27/86	11	5.5	0.17
18	05/07/86 - 05/08/86	112	3.6	0.16
19	05/17/86	81	3.8	0.37
20	05/20/86 - 05/22/86	34	4.3	0.60
21	05/23/86 - 05/24/86	80	3.9	0.23
22	05/29/86 - 06/02/86	24	4.4	0.68
23	06/09/86	57	3.9	2.14
24	06/12/86 - 06/13/86	19	4.4	1.74
25	06/17/86	59	3.9	0.16
26	06/19/86 - 06/20/86	131	3.6	0.12
27	06/24/86	67	3.9	0.27
28	06/27/86	44	4.0	0.20
29	07/02/86	17	4.4	1.46
30	07/12/86 - 07/13/86	45	4.1	1.72
31	07/26/86 - 07/27/86	44	4.0	0.84
32	07/29/86 - 07/30/86	65	3.9	0.95
33	08/01/86 - 08/02/86	64	3.9	0.94

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 29, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
34	08/07/86 - 08/08/86	109	3.6	0.05
35	08/08/86 - 08/11/86	87	3.8	1.10
36	08/16/86 - 08/17/86	62	3.8	0.46
37	08/22/86	13	4.6	0.48
38	08/23/86 - 08/24/86	59	3.9	0.50
39	09/04/86 - 09/05/86	78	3.8	0.27
40	09/16/86	83	3.8	0.31
41	09/21/86 - 09/24/86	97	3.7	0.42
42	09/25/86	32	4.6	0.08
43	10/02/86	25	4.3	0.50
44	10/03/86 - 10/05/86	38	4.1	1.49
45	10/14/86	17	4.5	0.20
46	10/26/86 - 10/27/86	22	4.4	0.59
47	11/05/86 - 11/06/86	24	4.4	0.40
48	11/08/86 - 11/09/86	14	4.6	0.92
49	11/11/86	12	4.7	0.38
50	11/19/86 - 11/20/86	15	4.7	0.40*
51	11/20/86 - 11/21/86	9	5.1	1.68
52	11/23/86 - 11/24/86	30	4.2	0.17
53	11/26/86 - 11/27/86	19	4.4	1.20
54	12/02/86 - 12/03/86	7	4.9	1.72
55	12/08/86 - 12/09/86	15	4.6	0.27
56	12/12/86	14	5.5	0.19*
57	12/18/86 - 12/19/86	8	4.9	1.26
58	12/24/86 - 12/25/86	15	4.6	1.50

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 30

ATMOSPHERIC DEPOSITION DATA FOR THE MARLBOROUGH SITE

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
1	05/29/83 - 05/31/83	36	4.1	1.39
2	06/04/83	42	4.1	0.99
3	06/27/83 - 06/28/83	75	3.8	2.63
4	07/05/83 - 07/06/83	89	3.7	0.27
5	07/21/83	46	4.0	0.39
6	07/24/83	40	4.0	0.91
7	08/11/83 - 08/12/83	27	4.2	1.75
8	09/23/83	11	4.7	1.18
9	10/01/83 - 10/02/83	5	4.8	2.22
10	10/12/83 - 10/13/83	10	4.8	1.22
11	10/18/83	32	4.2	0.19
12	10/23/83 - 10/24/83	4	5.3	1.97
13	11/03/83 - 11/04/83	38	4.0	0.75
14	11/10/83	20	4.4	1.27
15	11/15/83 - 11/16/83	6	4.9	1.73
16	11/21/83	12	4.7	0.49
17	11/24/83 - 11/25/83	7	4.9	2.43
18	11/28/83 - 11/29/83	21	4.4	1.04
19	12/06/83	30	4.3	0.68
20	12/12/83 - 12/14/83	40	4.6	1.89
1	01/10/84 - 01/11/84	7	4.7	0.77*
2	01/18/84 - 01/19/84	38	4.1	0.62*
3	01/24/84	23	4.4	0.18
4	01/30/84 - 01/31/84	36	4.1	0.64*
5	02/03/84 - 02/05/84	28	4.2	0.83
6	02/11/84	50	3.9	0.20
7	02/14/84 - 02/16/84	22	4.9	0.83
8	02/24/84 - 02/25/84	16	4.5	1.20
9	02/28/84 - 03/01/84	7	4.8	1.57
10	03/04/84 - 03/06/84	26	4.2	0.28
11	03/13/84 - 03/14/84	10	4.5	3.14*
12	03/18/84 - 03/19/84	48	3.9	0.27
13	03/21/84	15	4.4	0.47
14	03/28/84 - 03/30/84	6	5.0	0.44*
15	04/05/84	25	4.4	2.47
16	04/13/84 - 04/16/84	20	4.4	2.12
17	04/23/84 - 04/24/84	15	4.6	0.52
18	05/03/84 - 05/04/84	34	4.1	1.37
19	05/08/84	35	4.1	0.48
20	05/12/84 - 05/14/84	44	4.0	0.57

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 30, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
21	05/19/84 - 05/21/84	60	3.9	0.41
22	05/25/84	18	4.4	0.50
23	05/27/84 - 05/31/84	16	4.5	6.35*
24	05/31/84 - 06/02/84	7	4.8	1.46
25	06/19/84	57	3.9	0.12
26	06/25/84	11	4.9	1.73
27	06/28/84 - 06/29/84	63	3.9	0.21
28	07/07/84	13	4.5	4.18
29	07/16/84	88	3.8	0.15
30	07/18/84 - 07/19/84	26	4.3	1.09
31	07/21/84 - 07/22/84	4	5.1	1.35
32	07/27/84	32	4.2	0.57
33	09/04/84	39	4.1	3.91
34	09/15/84	30	4.3	1.04
35	10/01/84 - 10/02/84	7	4.8	1.96
36	10/22/84 - 10/23/84	18	4.4	2.41
37	10/23/84 - 10/24/84	33	4.3	0.13
38	10/26/84 - 10/29/84	39	4.0	1.32
39	11/05/84	8	4.9	0.52
40	11/11/84	6	5.0	1.93
41	11/15/84	64	3.9	0.10
42	12/03/84	22	4.5	0.56
43	12/05/84 - 12/06/84	6	4.9	1.19*
44	12/19/84	42	4.0	0.30
45	12/21/84 - 12/22/84	59	3.8	0.94*
1	01/01/85 - 01/02/85	28	4.1	0.33
2	01/04/85 - 01/05/85	38	4.1	0.20*
3	01/08/85	28	4.2	0.12*
4	01/17/85	11	4.7	0.11*
5	01/19/85 - 01/20/85	70	3.8	0.41*
6	01/31/85	50	4.0	0.10*
7	02/01/85 - 02/02/85	22	4.3	0.45*
8	02/05/85 - 02/06/85	18	4.3	0.59*
9	02/12/85	13	4.6	1.27
10	03/04/85 - 03/05/85	53	4.0	0.83*
11	03/07/85 - 03/08/85	41	4.0	0.34
12	03/12/85	26	4.2	1.19
13	03/18/85 - 03/19/85	49	4.0	0.15
14	03/31/85 - 04/01/85	28	4.3	0.60
15	04/07/85 - 04/08/85	41	4.2	0.33
16	04/14/85 - 04/15/85	68	3.9	0.05
17	04/19/85	68	3.9	0.10
18	04/22/85	42	4.1	0.70

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 30, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
19	04/26/85 - 04/28/85	59	3.5	0.13
20	05/02/85 - 05/06/85	26	4.3	2.55
21	05/18/85 - 05/19/85	17	4.6	0.11
22	05/27/85 - 05/28/85	26	4.3	1.95
23	06/01/85	23	4.4	0.51
24	06/05/85	31	4.2	0.85
25	06/08/85	73	3.8	0.29
26	06/12/85	60	3.9	0.27
27	06/16/85 - 06/17/85	18	4.4	1.67
28	06/18/85	48	4.0	0.84
29	06/24/85	86	3.8	0.24
30	06/25/85 - 06/29/85	38	4.1	0.80
31	07/03/85	80	3.7	0.25
32	07/12/85 - 07/14/85	95	3.7	0.40
33	07/15/85	51	4.0	0.19
34	07/21/85	103	3.7	0.94
35	07/26/85 - 07/27/85	12	4.6	2.57
36	07/31/85 - 08/01/85	69	3.8	2.30
37	08/25/85 - 08/26/85	16	4.4	3.20
38	08/30/85 - 08/31/85	46	4.0	1.00
39	09/04/85 - 09/05/85	70	3.9	0.26
40	09/06/85 - 09/08/85	22	4.3	1.34
41	09/09/85 - 09/10/85	95	3.7	0.17
42	09/24/85	8	5.1	0.54
43	09/27/85	85	4.9	0.77
44	10/03/85 - 10/04/85	35	4.2	0.31
45	10/05/85	19	4.4	0.71
46	10/13/85 - 10/15/85	56	4.0	0.61
47	10/19/85	91	3.7	0.14
48	10/25/85	11	4.6	0.29
49	11/05/85 - 11/06/85	10	4.7	1.79
50	11/11/85 - 11/12/85	40	4.0	1.09
51	11/14/85	56	4.0	0.23
52	11/16/85 - 11/17/85	6	4.9	1.60
53	11/22/85 - 11/24/85	11	4.6	0.35
54	11/26/85 - 11/29/85	47	4.0	0.55
55	11/28/85 - 11/30/85	19	4.4	1.06
56	12/11/85	56	3.9	0.56
57	12/13/85	29	4.3	0.27
58	12/20/85 - 12/23/85	46	4.0	0.13*
1	01/03/86 - 01/05/86	20	4.4	1.20
2	01/19/86 - 01/20/86	10	4.9	0.47
3	01/25/86 - 01/27/86	16	5.1	3.03

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 30, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
4	02/01/86 - 02/02/86	63	3.9	0.62*
5	02/04/86 - 02/05/86	16	4.5	0.52*
6	02/07/86 - 02/08/86	28	4.6	0.53*
7	02/11/86	21	4.6	0.24*
8	02/14/86 - 02/18/86	51	4.0	0.98
9	02/21/86	49	4.0	0.62
10	03/08/86 - 03/09/86	92	3.8	0.19
11	03/13/86 - 03/15/86	16	4.6	2.58
12	03/19/86	106	3.8	0.17
13	03/27/86	38	4.3	0.33
14	04/14/86 - 04/16/86	72	4.3	0.07
15	04/21/86	36	4.3	0.21
16	04/22/86 - 04/23/86	46	4.1	0.45
17	04/25/86 - 04/27/86	25	5.9	0.33
18	05/07/86 - 05/08/86	78	3.7	0.12
19	05/17/86	95	3.8	0.11
20	05/20/86 - 05/22/86	10	5.2	0.50
21	05/29/86 - 06/02/86	32	4.2	0.35
22	06/12/86 - 06/13/86	39	4.1	1.26
23	06/19/86 - 06/20/86	87	3.7	0.08
24	06/24/86	116	3.7	0.24
25	06/27/86	111	3.6	0.18
26	07/02/86	14	4.5	1.49
27	07/12/86 - 07/13/86	39	4.1	1.60
28	07/26/86 - 07/27/86	42	4.1	0.75
29	07/29/86 - 07/30/86	108	3.6	0.36
30	08/01/86 - 08/02/86	38	4.1	0.28
31	08/06/86 - 08/08/86	84	3.7	0.58
32	08/11/86	21	4.4	0.58
33	08/16/86 - 08/17/86	38	4.1	0.24
34	08/20/86	52	3.9	0.24
35	08/21/86	5	5.0	0.68
36	08/23/86 - 08/24/86	56	3.9	0.16
37	08/28/86	66	3.9	0.02
38	09/16/86	51	4.0	0.56
39	09/21/86 - 09/24/86	136	3.6	0.28
40	09/25/86	49	4.0	0.36
41	10/02/86	31	4.2	0.41
42	10/03/86 - 10/05/86	29	4.2	1.04
43	10/14/86	22	4.3	0.48
44	10/26/86 - 10/27/86	27	4.4	0.51
45	11/05/86 - 11/06/86	19	4.5	0.50
46	11/08/86 - 11/09/86	18	4.5	1.42
47	11/11/86	11	4.7	0.90

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

TABLE 30, CONTINUED

Event Number	Period of Collection	Specific Conductance	pH	Inches of Precipitation
48	11/19/86 - 11/20/86	12	4.7	4.02*
49	11/20/86 - 11/21/86	6	5.1	1.63
50	11/23/86 - 11/24/86	34	4.2	0.47
51	11/26/86 - 11/27/86	14	4.6	1.73
52	12/02/86 - 12/03/86	6	5.0	3.09
53	12/08/86 - 12/09/86	14	4.5	0.55
54	12/12/86	13	6.0	0.23*
55	12/18/86 - 12/19/86	5	5.2	4.29
56	12/24/86 - 12/25/86	13	4.7	1.58
57	12/30/86	33	4.2	0.22*

* Due to equipment failure or snowfall, datum is from nearby National Weather Service sites.

FIGURE 18

INCHES OF PRECIPITATION

PLAINFIELD SITE, 1986

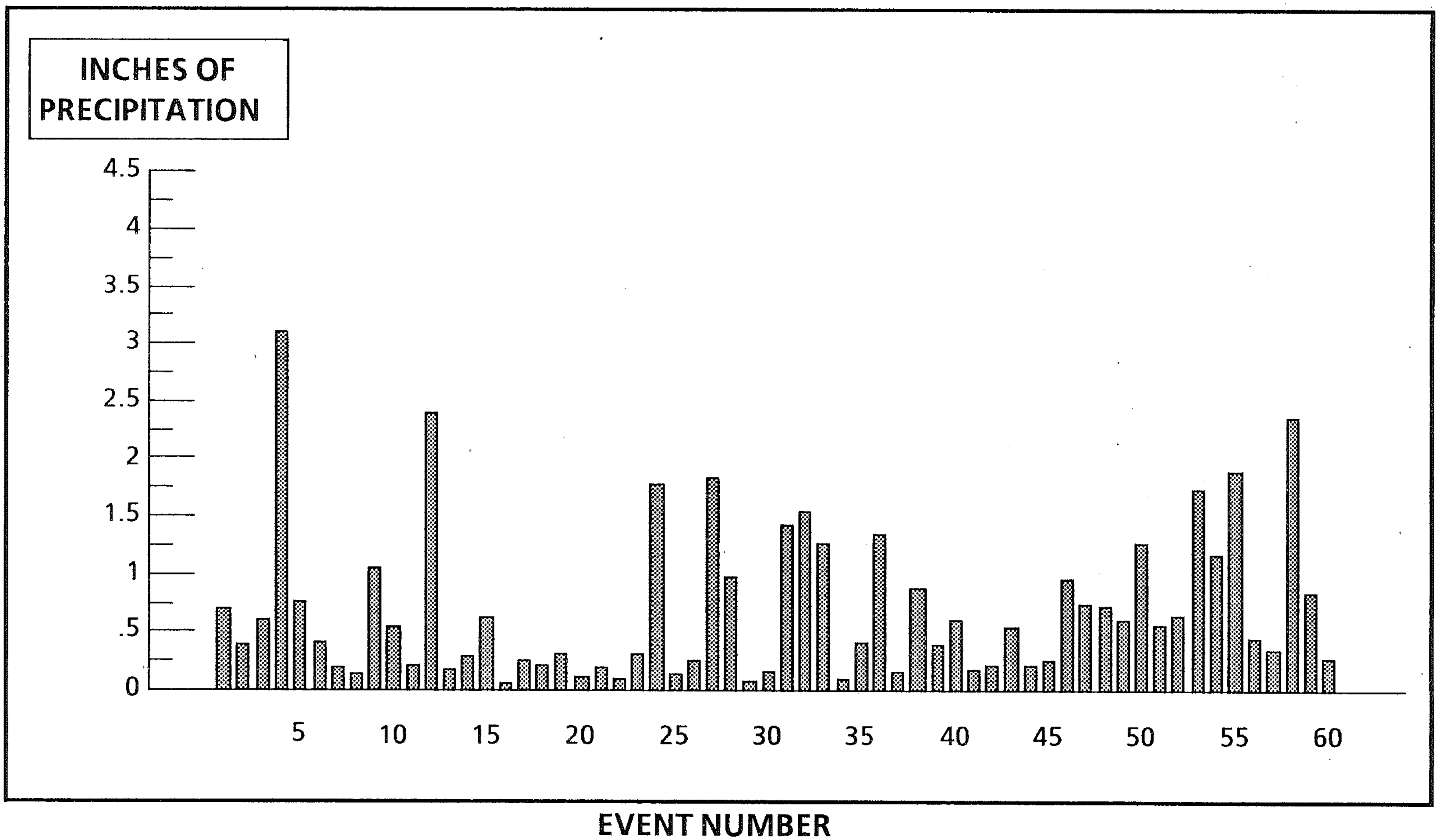
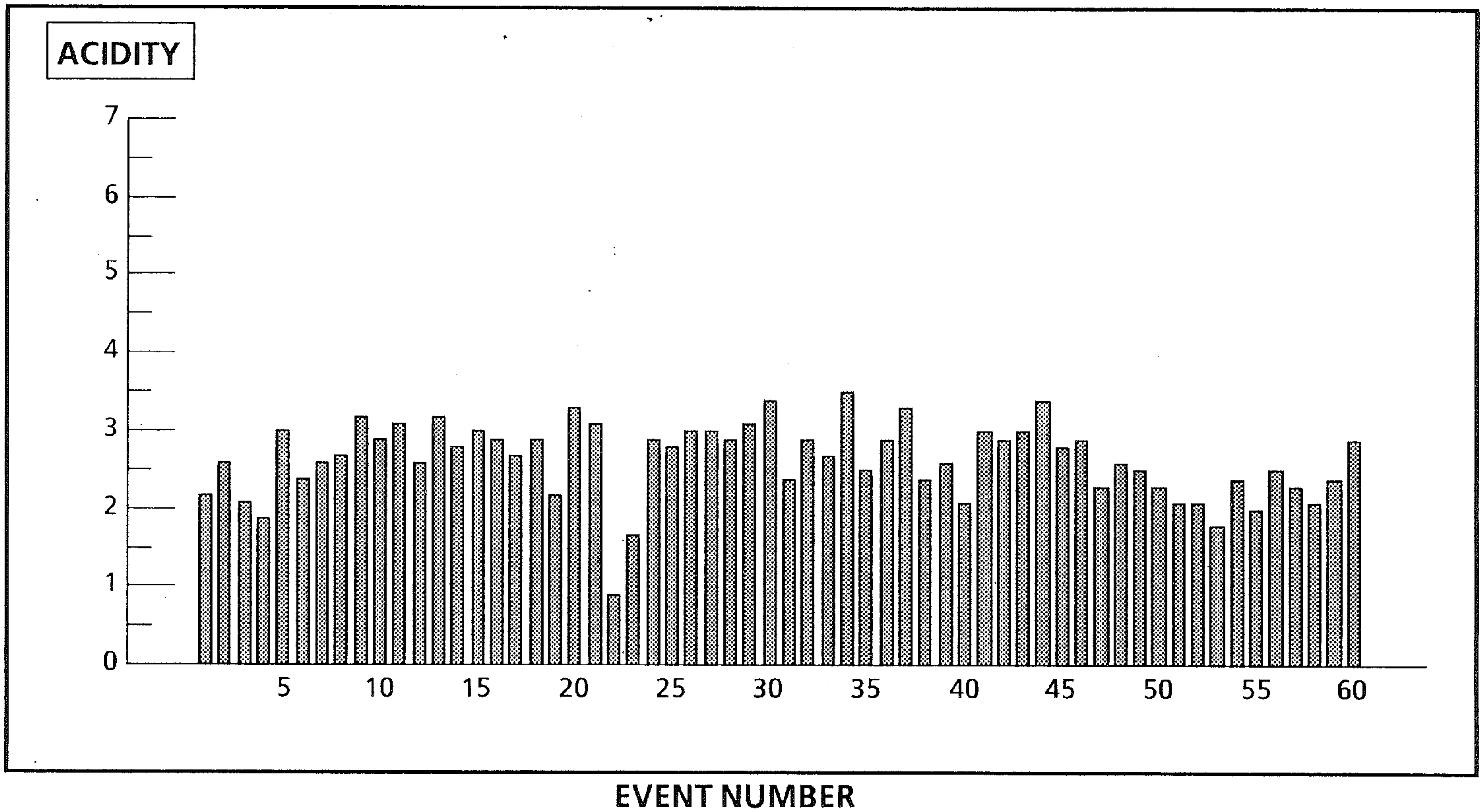


FIGURE 19

ACIDITY OF PRECIPITATION

PLAINFIELD SITE, 1986



ACIDITY = 7 - pH

FIGURE 20

SPECIFIC CONDUCTANCE OF PRECIPITATION

PLAINFIELD SITE, 1986

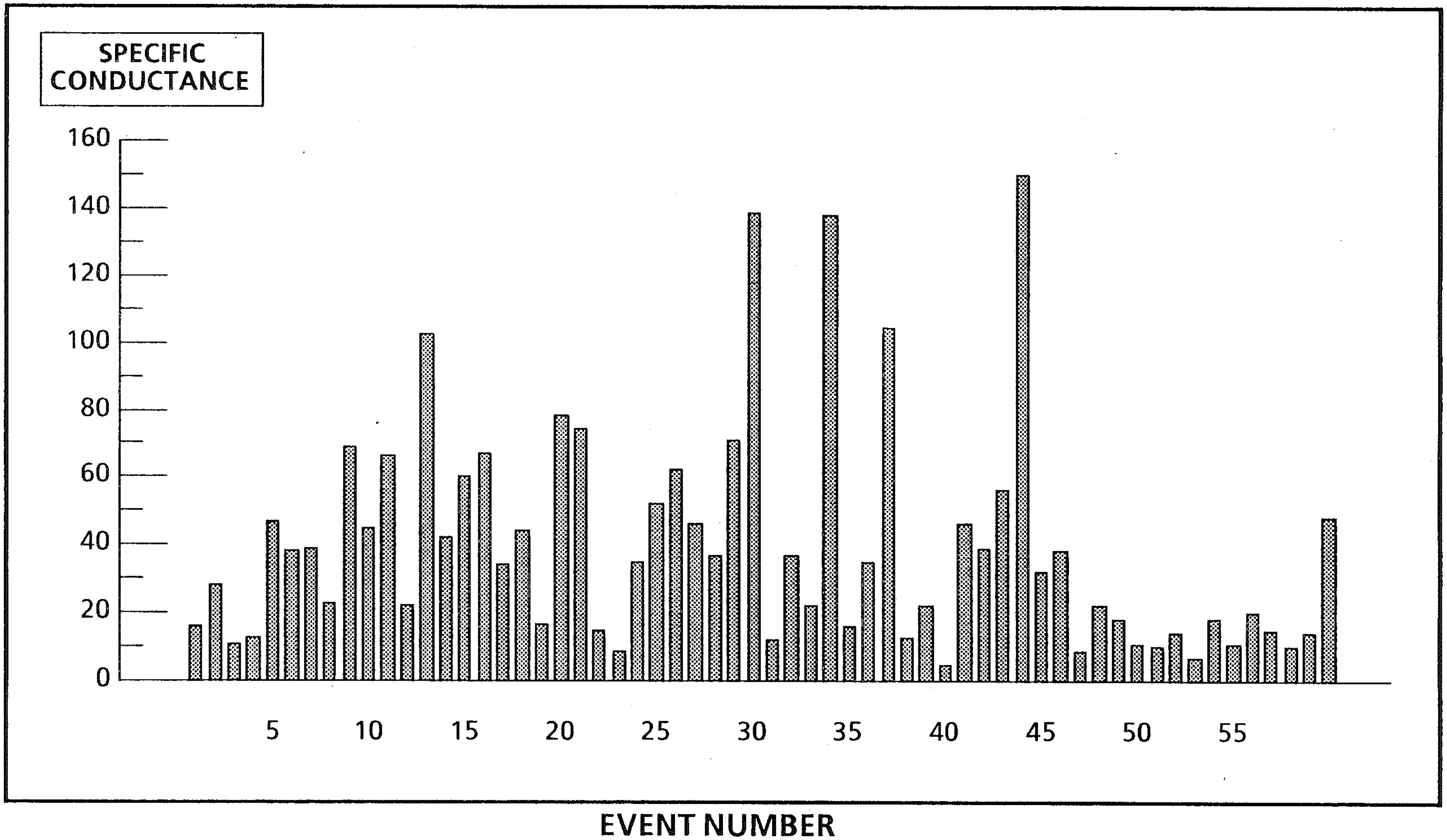
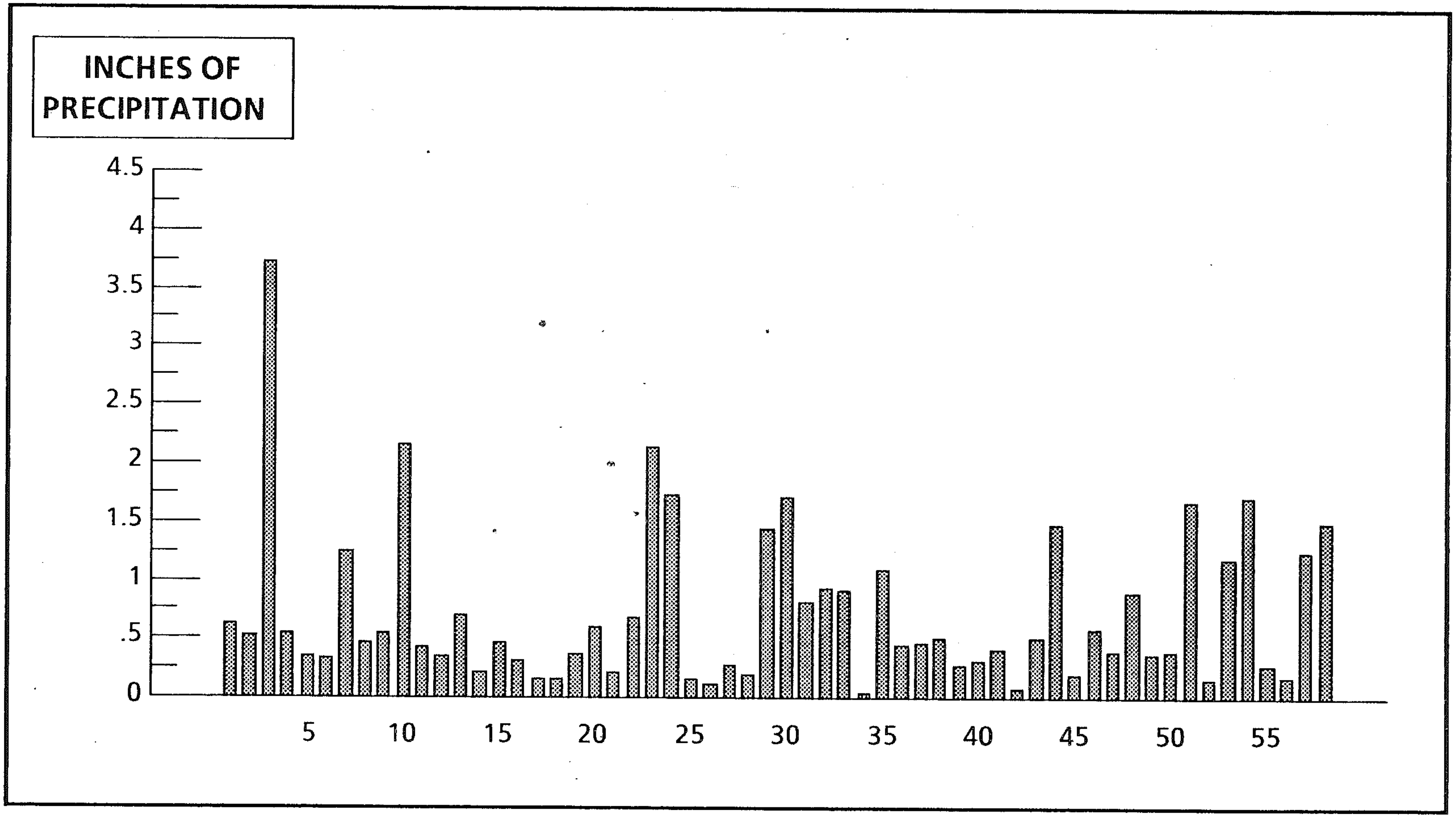


FIGURE 21

INCHES OF PRECIPITATION

MORRIS DAM SITE, 1986

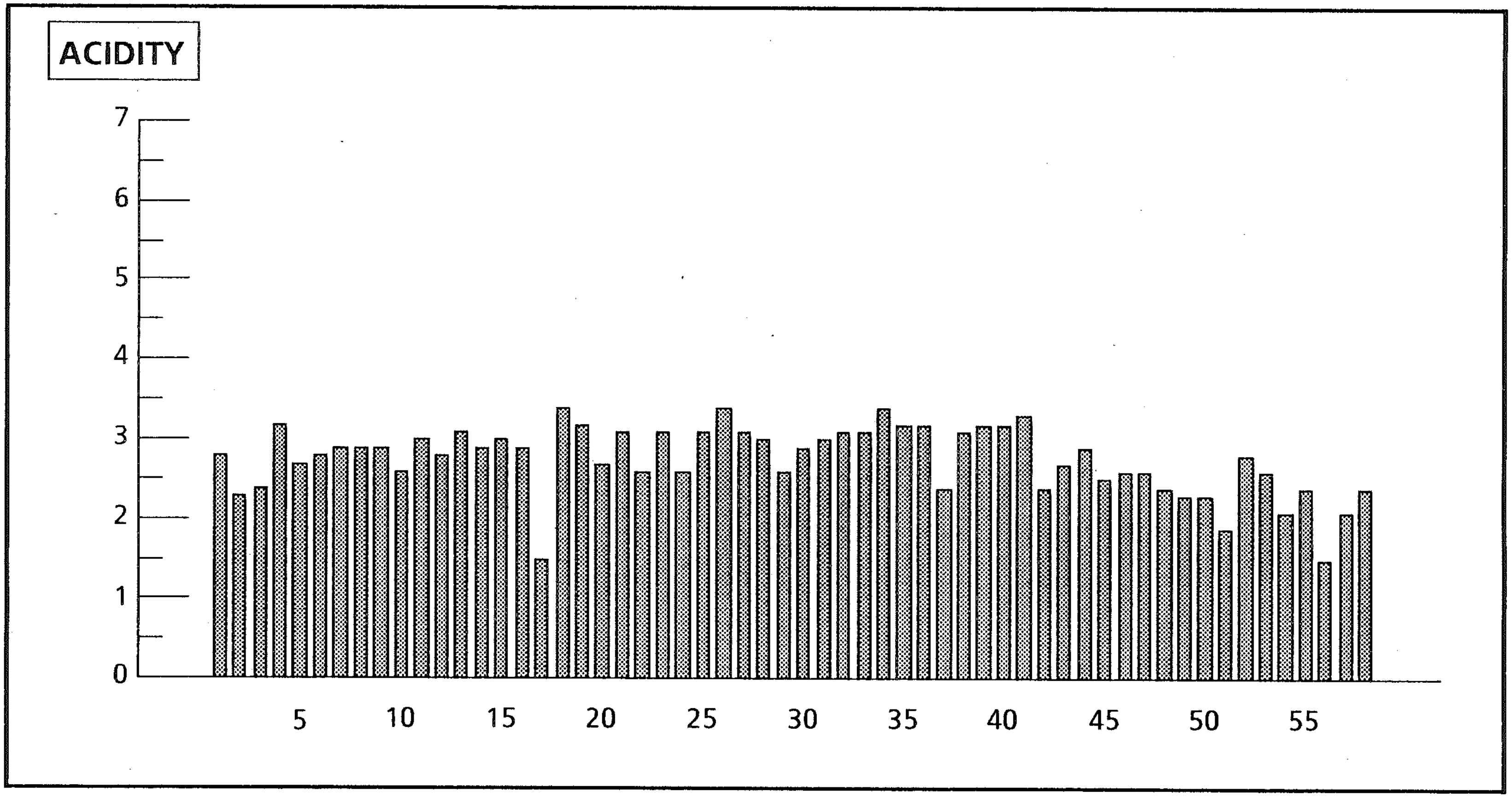


EVENT NUMBER

FIGURE 22

ACIDITY OF PRECIPITATION

MORRIS DAM SITE, 1986



ACIDITY = 7 - pH

FIGURE 23

SPECIFIC CONDUCTANCE OF PRECIPITATION

MORRIS DAM SITE, 1986

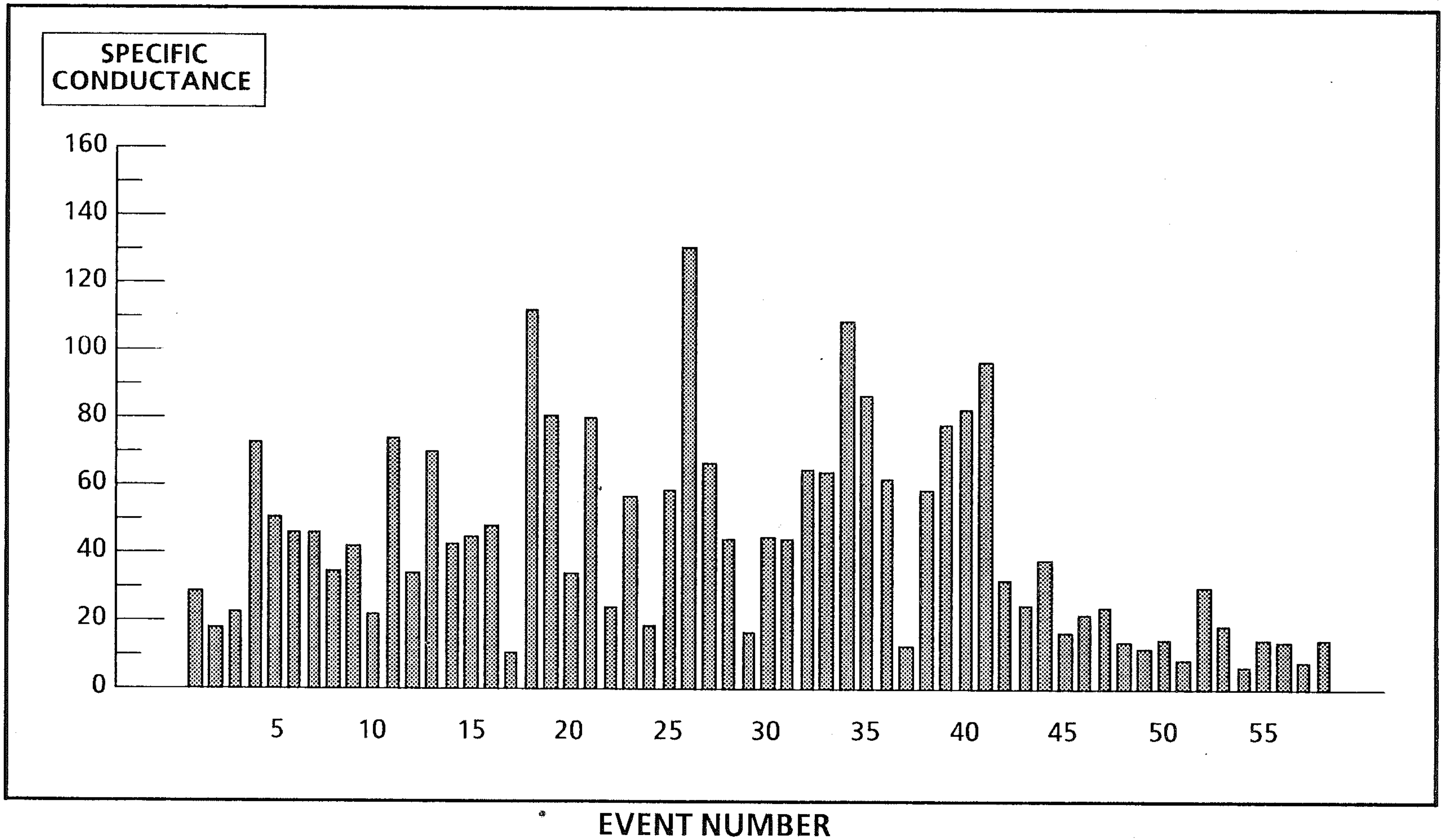


FIGURE 24

INCHES OF PRECIPITATION

MARLBOROUGH SITE, 1986

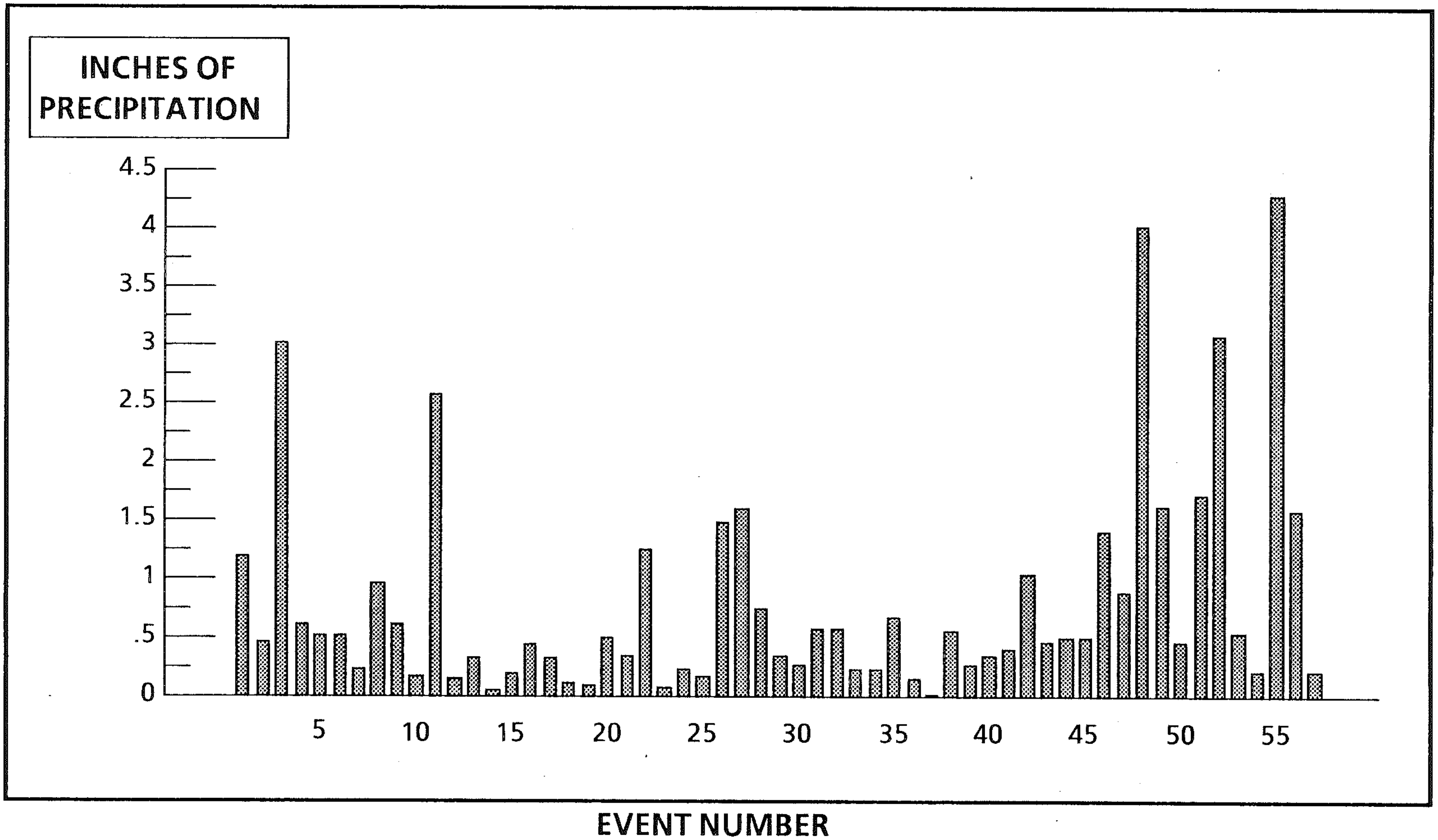
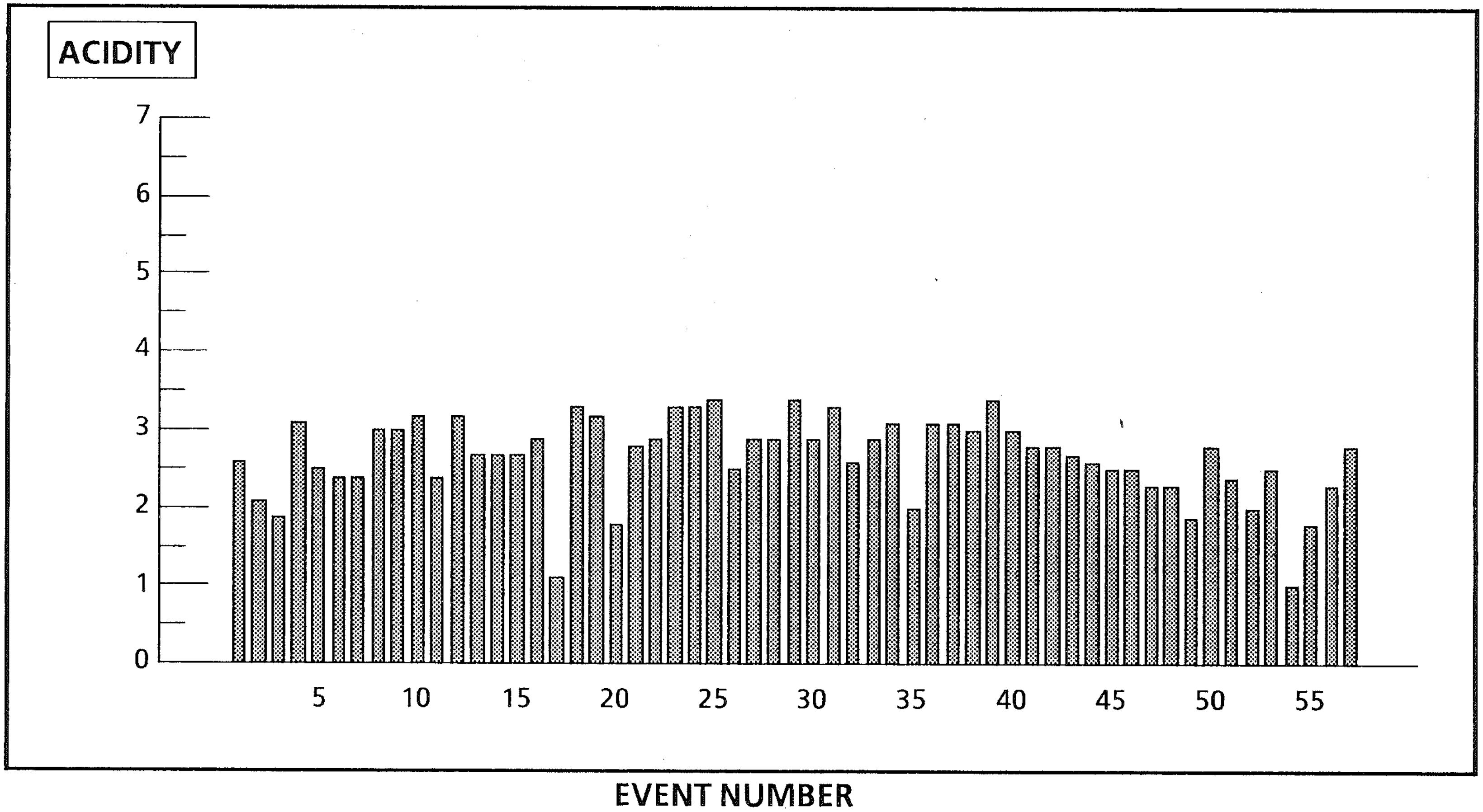


FIGURE 25

ACIDITY OF PRECIPITATION

MARLBOROUGH SITE, 1986

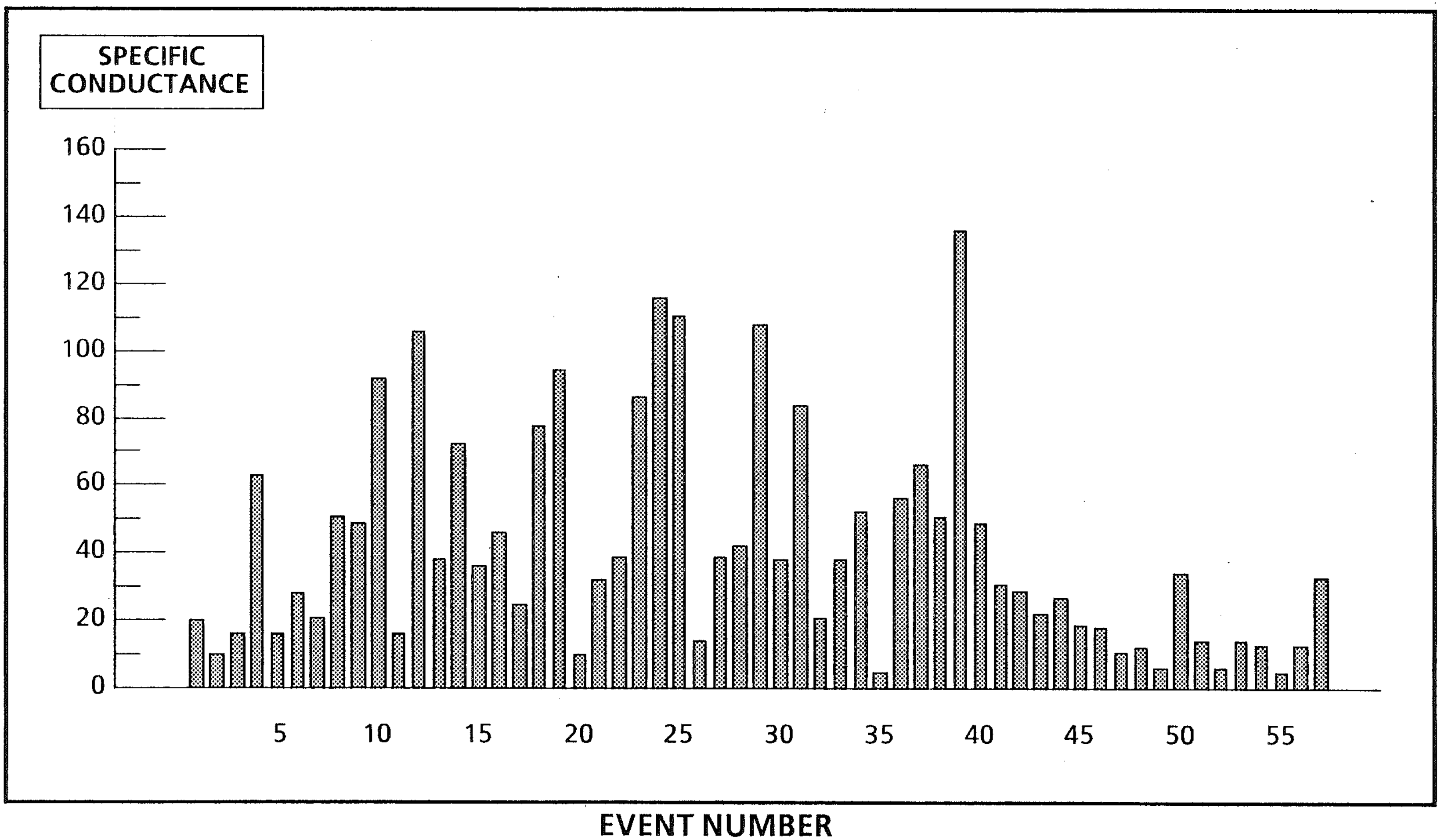


ACIDITY = 7 - pH

FIGURE 26

SPECIFIC CONDUCTANCE OF PRECIPITATION

MARLBOROUGH SITE, 1986



IX. CLIMATOLOGICAL DATA

Weather is often the most significant factor influencing short-term changes in air quality. It also has an affect on long-term trends. Climatological information from the National Weather Service station at Bradley International Airport in Windsor Locks is shown in Table 31 for the years 1985 and 1986. Table 32 contains information from the National Weather Service station located at Sikorsky Memorial Airport near Bridgeport. All data are compared to "mean" or "normal" values. Wind speeds* and temperatures are shown as monthly and yearly averages. Precipitation data includes both the number of days with more than 0.01 inches of precipitation and the total water equivalent. Also shown are degree days** (heating requirement) and the number of days with temperatures exceeding 90°F.

Wind roses for Bradley Airport and Newark Airport have been developed from 1986 National Weather Service surface observations and are shown in Figures 28 and 30, respectively. Wind roses from these stations for 1985 are shown in Figures 27 and 29, respectively.

* The mean wind speed for a month or year is calculated from all the hourly wind speeds, regardless of the wind directions.

** The degree day value for each day is arrived at by subtracting the average temperature of the day from 65°F. This number (65) is used as a base value because it is assumed that there is no heating requirement when the outside temperature is 65°F.

TABLE 31

1985 AND 1986 CLIMATOLOGICAL DATA
BRADLEY INTERNATIONAL AIRPORT, WINDSOR LOCKS

	AVERAGE TEMPERATURE °F			NO. OF DAYS WHEN MAX. TEMP. EXCEEDED 90°F			DEGREE DAYS			PRECIPITATION IN EQUIVALENT INCHES OF WATER			NO. OF DAYS WITH MORE THAN 0.01 INCHES OF PRECIPITATION			AVERAGE WIND SPEED (MPH)		
	1985	1986	Mean[a]	1985	1986	Mean[b]	1985	1986	Normal[c]	1985	1986	Mean[a]	1985	1986	Mean[d]	1985	1986	Mean[d]
Jan	21.5	27.4	26.5	0	0	0.0	1341	1159	1234	0.73	5.34	3.53	11	10	10.7	7.5	8.8	9.0
Feb	29.9	26.2	27.8	0	0	0.0	975	1081	1047	1.72	3.02	3.24	9	12	10.4	8.4	8.4	9.4
Mar	39.7	38.7	37.1	0	0	0.0	776	809	874	2.16	2.72	3.73	9	10	11.5	9.3	6.0	9.9
Apr	50.7	51.0	48.2	0	0	0.3	428	413	486	1.54	1.55	3.75	9	12	11.0	7.7	9.2	10.1
May	60.6	61.7	59.1	1	2	1.1	167	174	197	2.77	2.28	3.61	9	12	11.6	7.9	9.0	8.9
Jun	63.7	66.0	67.9	0	1	3.6	76	63	20	3.55	6.79	3.58	13	14	11.4	6.7	9.3	8.1
Jul	72.4	72.3	73.2	1	3	7.8	0	14	0	4.55	4.44	3.53	11	10	9.6	6.2	7.9	7.5
Aug	70.2	69.5	71.0	2	0	4.5	14	32	8	6.44	3.44	3.81	9	11	9.9	5.2	7.4	7.1
Sep	63.4	61.8	63.5	1	1	1.5	119	135	102	3.83	0.84	3.58	10	9	9.4	5.5	7.3	7.2
Oct	51.9	51.4	53.0	0	0	*	401	422	391	2.27	2.18	3.15	9	8	8.3	6.0	7.4	7.7
Nov	43.2	38.3	42.0	0	0	0.0	648	793	702	6.04	5.57	3.80	14	12	11.3	7.4	8.0	8.3
Dec	27.5	33.1	30.4	0	0	0.0	1157	981	1113	1.28	6.15	3.77	10	10	12.2	7.7	8.4	8.6
YEAR	49.6	49.8	50.0	5	7	18.7	6102	6076	6174	36.88	44.32	43.07	123	130	127.2	7.1	8.4	8.5

* Less than 0.05
[a] 1905-1986
[b] 1960-1986
[c] 1951-1980
[d] 1955-1986

Extracted From: Local Climatological Data Charts
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Data Service

TABLE 32

1985 AND 1986 CLIMATOLOGICAL DATA
SIKORSKY INTERNATIONAL AIRPORT, STRATFORD

	AVERAGE TEMPERATURE °F			NO. OF DAYS WHEN MAX. TEMP. EXCEEDED 90 °F			DEGREE DAYS			PRECIPITATION IN EQUIVALENT INCHES OF WATER			NO. OF DAYS WITH MORE THAN 0.01 INCHES OF PRECIPITATION			AVERAGE WIND SPEED (MPH)		
	1985	1986	Mean[a]	1985	1986	Mean[b]	1985	1986	Normal[c]	1985	1986	Mean[d]	1985	1986	Mean[e]	1985	1986	Mean[f]
Jan	26.2	30.6	28.4	0	0	0.0	1197	1060	1101	1.25	2.66	3.58	12	8	10.6	---	---	13.2
Feb	32.3	29.2	30.5	0	0	0.0	908	997	963	1.72	3.05	3.30	5	13	9.6	---	---	13.6
Mar	41.8	39.9	37.9	0	0	0.0	713	772	831	1.93	2.32	3.94	11	9	11.2	---	---	13.5
Apr	50.8	50.6	48.0	0	0	0.0	423	425	492	0.69	1.65	3.87	11	12	10.5	---	---	13.0
May	60.9	61.1	58.4	0	0	*	138	174	220	5.11	0.41	3.71	10	9	11.0	---	---	11.6
Jun	65.6	66.8	67.8	0	0	0.8	43	41	20	5.34	3.16	3.39	12	14	9.6	---	---	10.5
Jul	73.6	73.1	73.3	0	3	3.0	0	3	0	5.19	5.74	3.71	9	9	8.3	---	---	10.0
Aug	72.8	70.7	71.9	2	0	1.4	2	23	0	4.62	2.43	3.96	9	13	9.3	---	---	10.1
Sep	66.6	64.7	65.2	1	0	0.4	54	68	49	1.60	0.85	3.47	6	10	8.4	---	---	11.2
Oct	56.0	54.3	54.8	0	0	0.0	278	345	285	1.48	2.14	3.33	7	8	7.1	---	---	11.9
Nov	46.6	42.3	44.2	0	0	0.0	541	673	585	5.67	4.91	3.80	14	11	10.2	---	---	12.7
Dec	31.4	35.5	33.2	0	0	0.0	1032	908	955	1.25	4.41	3.69	13	12	11.4	---	---	13.0
YEAR	52.1	51.6	51.1	3	3	5.7	5329	5489	5501	35.85	33.73	43.72	119	128	117.2	---	---	12.0

* Less than 0.05
a 1903-1986
b 1966-1986
c 1951-1980
d 1894-1986
e 1949-1986
f ~~1964-1986~~ 1958-1980

Extracted From: Local Climatological Data Charts
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Data Service

FIGURE 27

ANNUAL WIND ROSE FOR 1985
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

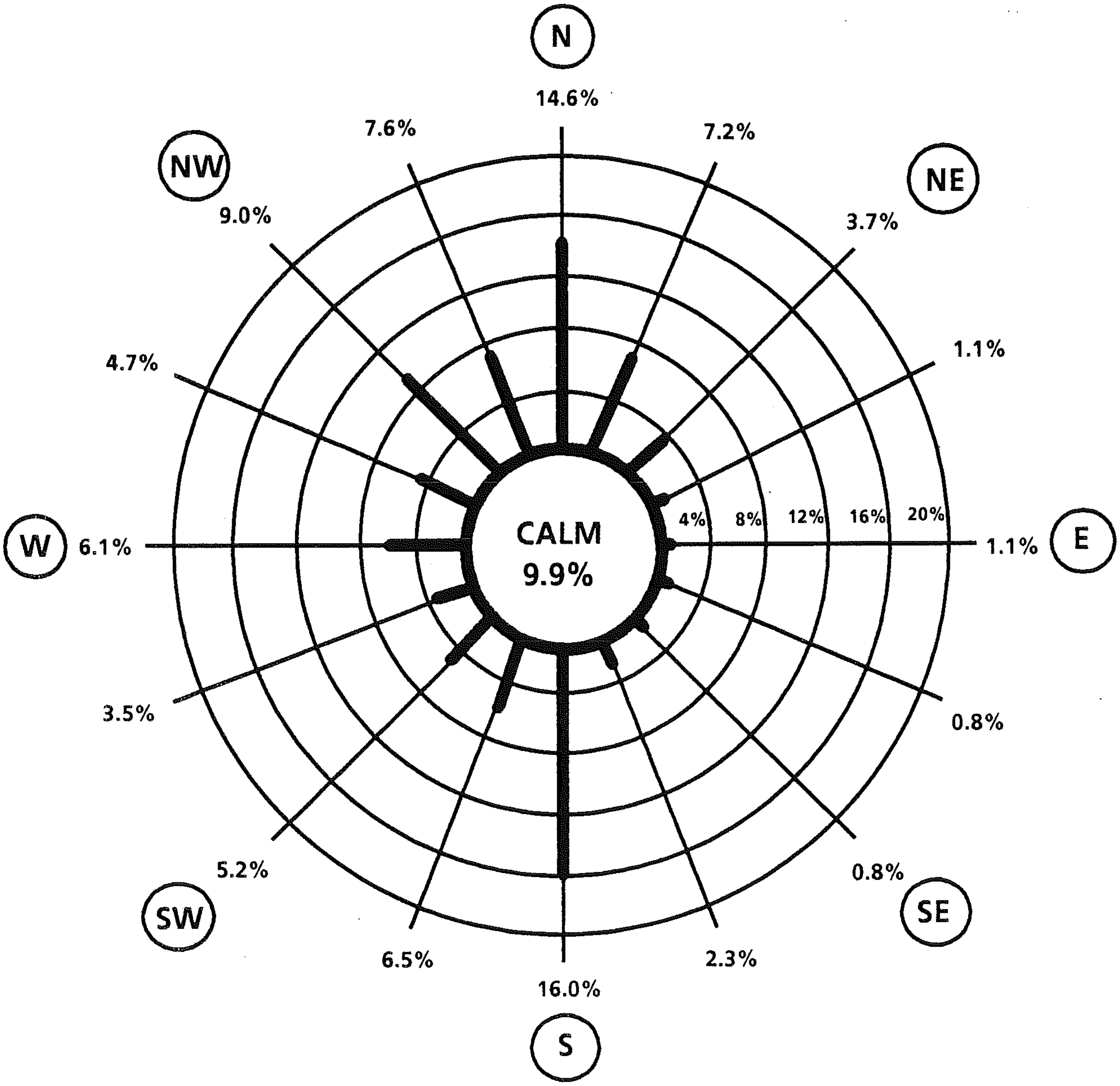


FIGURE 28

ANNUAL WIND ROSE FOR 1986
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

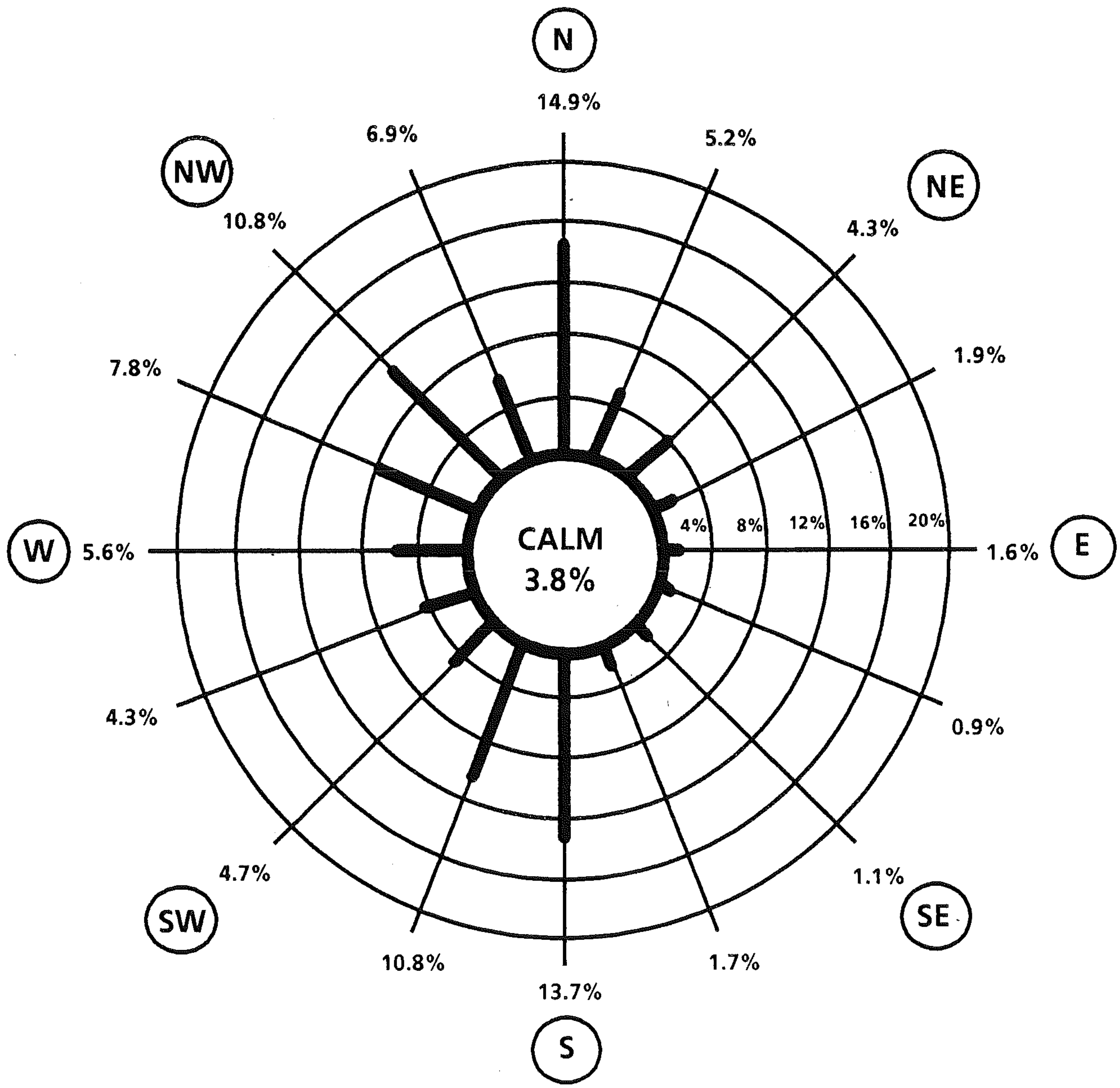


FIGURE 29

ANNUAL WIND ROSE FOR 1985
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY

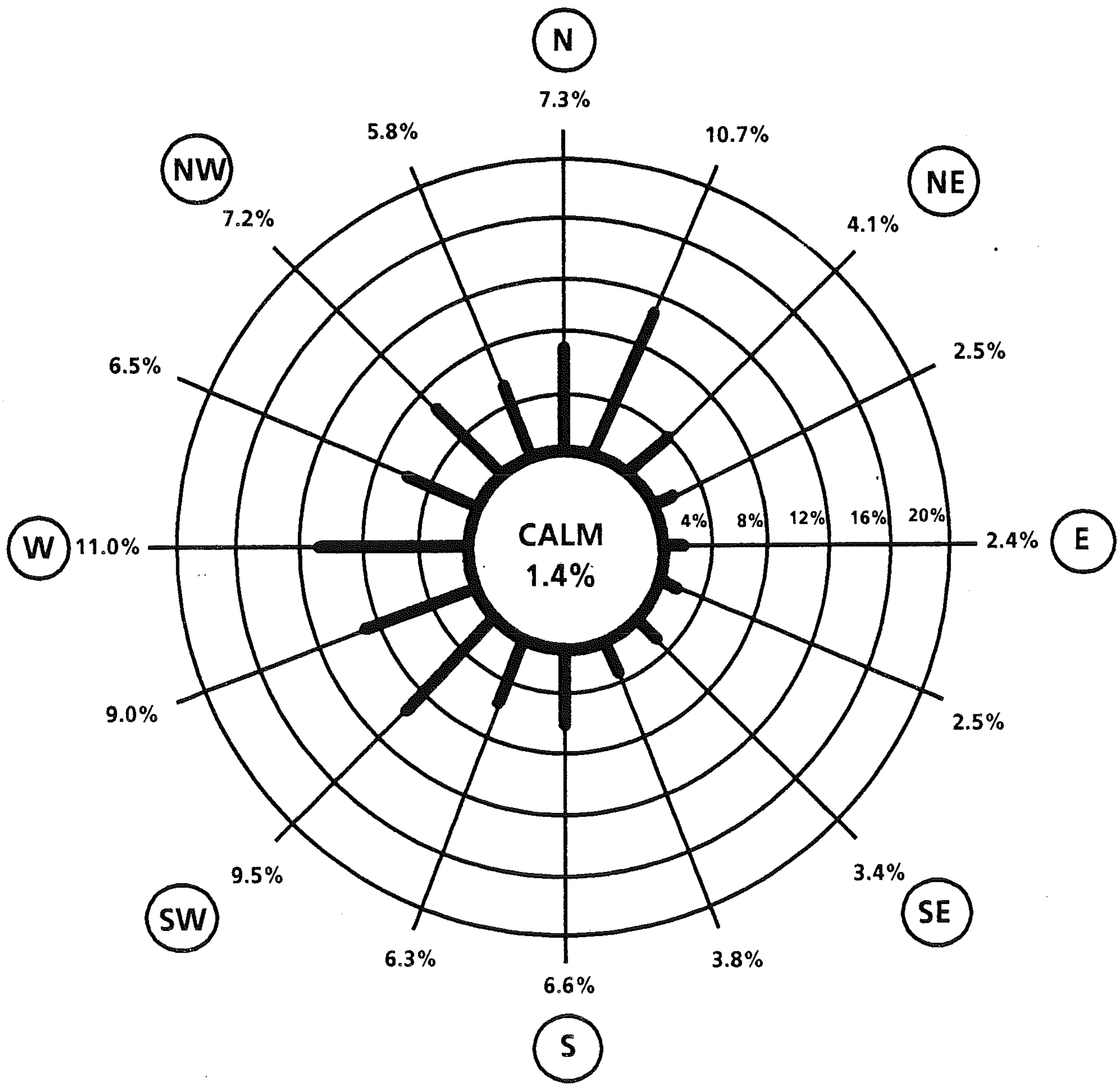
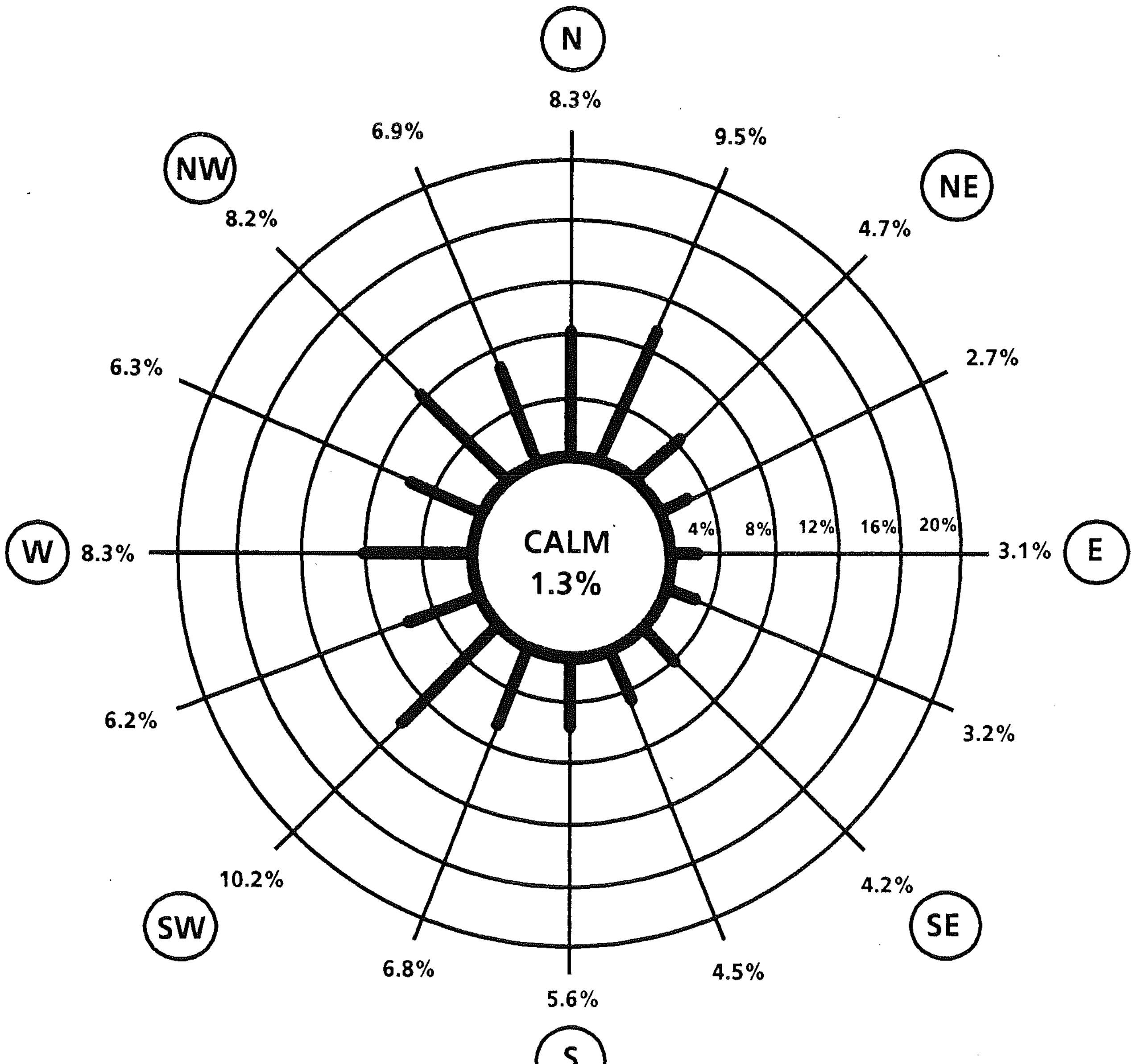


FIGURE 30

ANNUAL WIND ROSE FOR 1986
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY



X. ATTAINMENT AND NON-ATTAINMENT OF NAAQS IN CONNECTICUT'S AQCR'S

The attainment status designations for Connecticut's four Air Quality Control Regions (AQCR's, see Figure 31) with regard to the National Ambient Air Quality Standards (NAAQS) have been determined for 1986 for the following pollutants: total suspended particulates (TSP); sulfur dioxide (SO_2); ozone (O_3); nitrogen dioxide (NO_2); carbon monoxide (CO) ; and lead (Pb). Table 33 shows the attainment status of each AQCR by pollutant. The AQCR's are classified as attainment, non-attainment or unclassifiable. These classifications conform to federal EPA guidelines and were applied in each case only after federal approval was granted. The federal EPA classifies an AQCR as attainment for a particular pollutant when all standards are attained (i.e., short term, long term, primary and secondary, wherever applicable). This notwithstanding, Table 33 contains the AQCR classifications with respect to all relevant short-term and long-term standards.

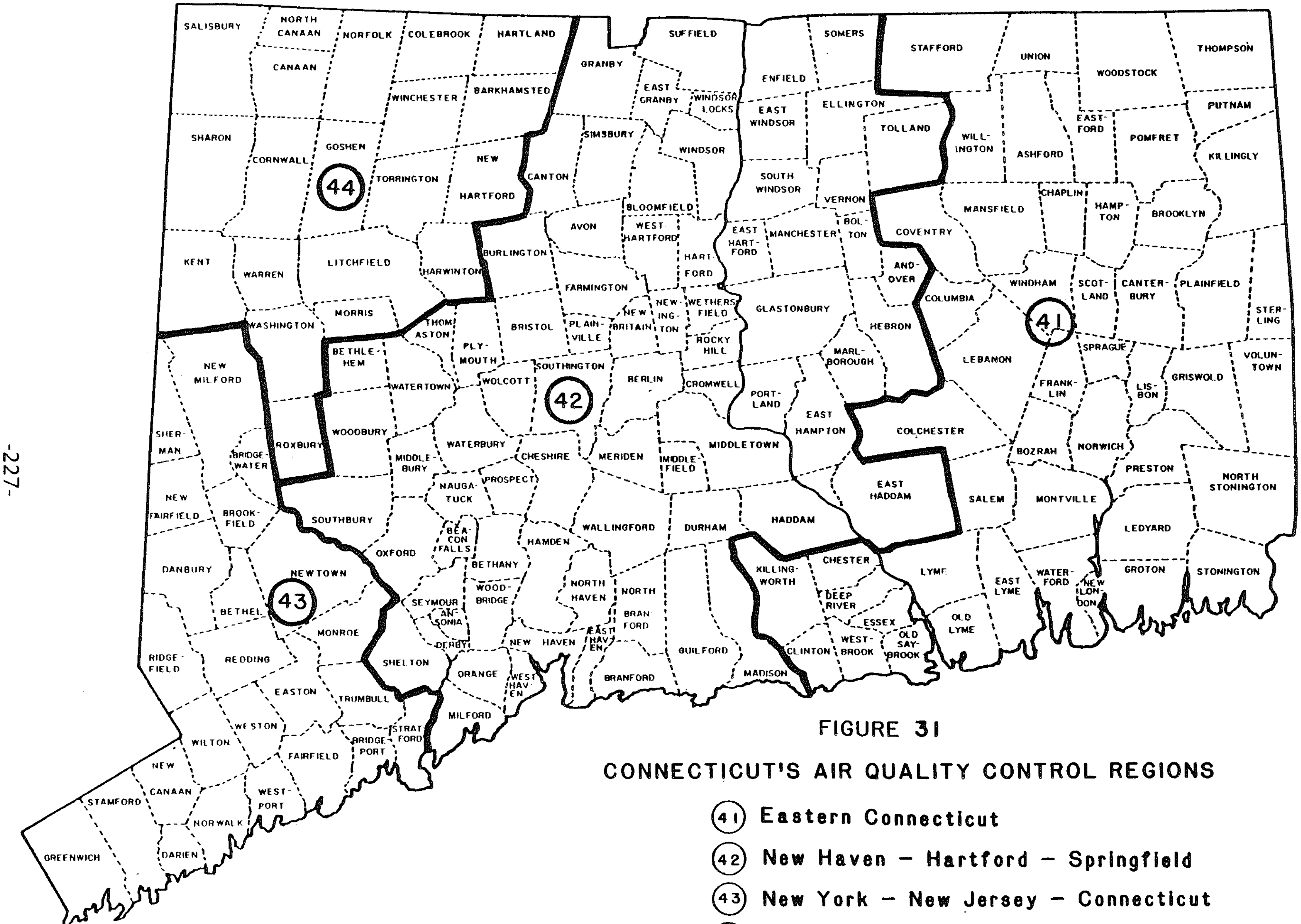


FIGURE 31

CONNECTICUT'S AIR QUALITY CONTROL REGIONS

(41) Eastern Connecticut

(42) New Haven – Hartford – Springfield

(43) New York – New Jersey – Connecticut

(44) Northwestern Connecticut

TABLE 33

CONNECTICUT'S COMPLIANCE BY AQCR WITH THE NAAQS IN 1986

Pollutant	Primary or Secondary	NAAQS	AQCR 41	AQCR 42	AQCR 43	AQCR 44
TSP	Primary	Annual	A	A	A	A
		24-Hour	A	A	A	A
	Secondary	Annual	A	A	A	A
		24-Hour	X	X	X	X
SO_2	Primary	Annual	A	A	A	A
		24-Hour	A	A	A	A
	Secondary	3-Hour	A	A	A	A
Ozone	Both	1-Hour	X	X	X	X
NO_2	Both	Annual	A	A	A	A
CO	Both	1-Hour	A	A	A	A
		8-Hour	U	X	X	U
Lead	Both	3-Month	A	A	A	A

X = Non-Attainment
U = Unclassifiable
A = Attainment

XI. CONNECTICUT SLAMS AND NAMS NETWORK

On May 10, 1979, the U.S. Environmental Protection Agency made public its final rulemaking for ambient air monitoring and data reporting requirements in the "Federal Register" (Vol. 44, No. 92). These regulations are meant to ensure the acceptability of air measurement data, the comparability of data from all monitoring stations, the cost-effectiveness of monitoring networks, and timely data submission for assessment purposes. The regulations address a number of key areas including quality assurance, monitoring methodologies, network design and probe siting. Detailed requirements and specific criteria are provided which form the framework for ambient air quality monitoring. These regulations apply to all parties conducting ambient air quality monitoring for the purpose of supporting or complying with environmental regulations. In particular, state/local control agencies and industrial/private concerns involved in air monitoring are directly influenced by specific requirements, compliance dates and recommended guidelines.

QUALITY ASSURANCE

The regulations specify the minimum quality assurance requirements for State and Local Air Monitoring Stations (SLAMS) networks, National Air Monitoring Stations (NAMS) networks, and Prevention of Significant Deterioration (PSD) air monitoring. Two distinct and equally important functions make up the quality assurance program: assessment of the quality of monitoring data by estimating their precision and accuracy, and control of the quality of the data by implementation of quality control policies, procedures, and corrective actions. (See Part E of Section I, Quality Assurance).

The data assessment requirements entail the determination of precision and accuracy for both continuous and manual methods. A one-point precision check must be carried out at least once every other week on each automated analyzer used to measure SO_2, NO_2, CO and O_3. Standards from which the precision check test data are derived must meet specifications detailed in the regulations. For manual methods, precision checks are to be accomplished by operating co-located duplicate samplers. In addition, precision checks for lead are also accomplished by analysis of duplicate strips. In 1986, Connecticut maintained three co-located TSP monitors (Bridgeport 009, Hartford 003, and Waterbury 005; in the fourth quarter of 1986, Bridgeport 009 was replaced by Bridgeport 123, and Waterbury 005 was replaced by Waterbury 007). In addition, duplicate strip analyses were performed at five sites (Bridgeport 123, Hartford 016, New Haven 018, ~~New Haven 123~~, Waterbury 007, and Waterbury 123).

Accuracy determinations for automated analyzers (SO_2, NO_2, CO, O_3) are accomplished by audits performed by an independent auditor utilizing equipment and gases which are disassociated from the normal network operations. Accuracy determinations are accomplished via traceable standard flow devices for hi-vols and via spiked strip analyses for lead. For SLAMS analyzers, accuracy audits must be performed on each analyzer at least once per calendar year. Each PSD analyzer must be audited at least once each calendar quarter.

All precision and accuracy data are derived through calculation methods specified by the regulations, with the results reported quarterly on Data Assessment Report Forms. The NAMS network is actually part of the SLAMS network; so the SLAMS accuracy determinations also apply to the NAMS network. The distinguishing characteristics of NAMS are: 1) the sites are located in high population, high pollution areas (i.e., urban areas); 2) only continuous instruments are used to monitor gaseous pollutants; 3) the regulations specify a minimum number and locations for them; and 4) the data, in addition to being included in the annual report, are required to be reported quarterly to EPA.

In order to control the quality of data, the monitoring program must have operational procedures for each of the following activities:

1. Installation of equipment,
2. Selection of methods, analyzers, or samplers,
3. Zero/span checks and analyzer adjustments,
4. Calibration,
5. Control limits for zero/span and other control checks, and respective corrective actions when such limits are exceeded,
6. Control checks and their frequency,
7. Preventive and remedial maintenance,
8. Calibration and zero/span checks for multi-range analyzers,
9. Recording and validating data, and
10. Documentation of quality control information.

MONITORING METHODOLOGIES

Except as otherwise stated within the regulations, the monitoring methods used must be "reference" or "equivalent," as designated by the EPA. Table 34 lists methods used in Connecticut's network in 1986 which were on the EPA-approved list as of September 18, 1980. Additional updates to these approved methods are provided through the "Federal Register."

NETWORK DESIGN

The regulations also describe monitoring objectives and general criteria to be applied in establishing the SLAMS networks and for choosing general locations for new monitors. Criteria are also presented for determining the location and number of monitors. These criteria serve as the framework for all State Implementation Plan (SIP) monitoring networks that were to be complete and in operation by January 1, 1984.

The SLAMS network must be designed to meet four basic monitoring objectives: (1) to determine the highest pollutant concentration in the area; (2) to determine representative concentrations in areas of high population density; (3) to determine the ambient impact of significant sources or source categories; and (4) to determine general background concentration levels. Proper siting of a monitor requires precise specification of the monitoring objectives, which usually includes a desired spatial scale of representativeness. The spatial scales of representativeness are specified in the regulations for all pollutants and monitoring objectives. The 1986 SLAMS and NAMS networks in Connecticut are presented and described in Table 35.

PROBE SITING

Location and exposure of monitoring probes have been an area of confusion for a number of years because of conflicting guidelines and a lack of guidance or recommended criteria. The probe siting criteria promulgated in the regulations are specific. They are also sufficiently comprehensive to define the requirements for ensuring the uniform collection of compatible and comparable air quality data.

These criteria are detailed by pollutant and include vertical and horizontal probe placement, spacing from obstructions and trees, spacing from roadways, probe material and sample residence time, and various other considerations. A summary of the probe siting criteria is presented in Table 36. The siting criteria generally apply to all spatial scales except where noted. The most notable exception is spacing from roadways which is dependent on traffic volume.

For the chemically reactive gases SO_2, NO_2, and O_3,the regulations specify borosilicate glass, FEP teflon or their equivalent as the only acceptable probe materials. Additionally, in order to minimize the effects of particulate deposition on probe walls, sampling probes for reactive gases must have residence times of less than 20 seconds.

TABLE 34

U. S. EPA-APPROVED MONITORING METHODS USED IN CONNECTICUT IN 1986

Pollutant	Monitoring Methods		
	Reference Manual	Reference Automated	Equivalent Automated
TSP	High Volume Method		
SO_2			Thermo Electron 43 (0.5)
O_3			DASIBI 1008-RS (0.5)
CO		Bendix 8501-5CA (50)	
NO_2		Thermo Electron 14 B/E (0.5)	
Lead	High Volume Method Low Volume Method*		

* This is a modified reference method approved by EPA on 2/29/84.

( ) = Approved range in ppm

TABLE 35

1986 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling & Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale of Representativeness
				SULFUR DIOXIDE			
Bridgeport	Bridgeport	012	S	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
Bridgeport	Bridgeport	123	N	Pulsed Fluorescence	Continuous	Population	Neighborhood
Danbury	Danbury	123	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
E. Hartford	Hartford	005	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
East Haven	New Haven	003	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Enfield	Springfield/ Hartford	005	S	Pulsed Fluorescence	Continuous	Background	Regional
Greenwich	Stamford	017	S	Pulsed Fluorescence	Continuous	Background	Urban
Groton	New London/ Norwich	007	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Hartford	Hartford	123	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Milford	Bridgeport	002	S	Pulsed Fluorescence	Continuous	Source	Middle
New Britain	New Britain	011	S	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
New Haven	New Haven	017	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
New Haven	New Haven	123	N	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
Norwalk	Norwalk	013	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Stamford	Stamford	025	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Stamford	Stamford	123	S	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
Waterbury	Waterbury	008	S	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
Waterbury	Waterbury	123	S	Pulsed Fluorescence	Continuous	Population	Neighborhood

TABLE 35, CONTINUED

1986 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling & Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale of Representativeness
				NITROGEN OXIDES			
Bridgeport	Bridgeport	123	S	Chemiluminescent	Continuous	High Concentration	Neighborhood
E. Hartford	Hartford	003	S	Chemiluminescent	Continuous	High Concentration	Neighborhhod
New Haven	New Haven	123	S	Chemiluminescent	Continuous	High Concentration	Neighborhood
				OZONE			
Bridgeport	Bridgeport	123	N	Chemiluminescent	Continuous	Population	Neighborhood
Danbury	Danbury	123	S	Chemiluminescent	Continuous	Population	Urban
E. Hartford	Hartford	003	N	Chemiluminescent	Continuous	Population	Neighborhood
Greenwich	Stamford	017	S	Chemiluminescent	Continuous	Background	Regional
Groton	New London/ Norwich	008	S	Chemiluminescent	Continuous	High Concentration	Urban
Middletown	Hartford	007	N	Chemiluminescent	Continuous	High Concentration	Urban
New Haven	New Haven	123	N	Chemiluminescent	Continuous	Population	Neighborhood
Stafford	NONE	001	N	Chemiluminescent	Continuous	High Concentration	Urban
Stratford	Bridgeport	007	N	Chemiluminescent	Continuous	High Concentration	Urban
				CARBON MONOXIDE			
Bridgeport	Bridgeport	004	S	NDIR	Continuous	High Concentration	Micro
Hartford	Hartford	017	S	NDIR	Continuous	High Concentration	Micro
New Britain	New Britain	002	S	NDIR	Continuous	High Concentration	Micro
New Haven	New Haven	019	S	NDIR	Continuous	High Concentration	Micro
Stamford	Stamford	020	S	NDIR	Continuous	High Concentration	Micro

TABLE 35, CONTINUED

1986 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale of Representativeness
				TOTAL SUSPENDED PARTICULATES				
Ansonia	Bridgeport	004	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Bridgeport	Bridgeport	001	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Bridgeport	Bridgeport	009	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Bridgeport	Bridgeport	123	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Bristol	Bristol	001	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Burlington	NONE	001	S	Hi-Vol	Gravimetric	6th day	Background	Regional
Danbury	Danbury	002	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Danbury	Danbury	123	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
E. Hartford	Hartford	004	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Greenwich	Stamford	008	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Groton	New London/ Norwich	006	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Hartford	Hartford	003	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Hartford	Hartford	013	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Hartford	Hartford	014	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Manchester	Hartford	001	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Meriden	Meriden	002	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Middletown	Hartford	003	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Milford	Bridgeport	002	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Morris	NONE	001	S	Hi-Vol	Gravimetric	6th day	Background	Regional
Naugatuck	Waterbury	001	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
New Britain	New Britain	007	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
New Britain	New Britain	008	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
New Britain	New Britain	009	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
New Haven	New Haven	002	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
New Haven	New Haven	013	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood

TABLE 35, CONTINUED

1986 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale of Representativeness
				TOTAL SUSPENDED PARTICULATES				
Norwalk	Norwalk	001	S	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Norwalk	Norwalk	005	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Norwalk	Norwalk	012	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Norwich	New London/ Norwich	002	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Stamford	Stamford	001	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Stamford	Stamford	007	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Stamford	Stamford	021	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Stratford	Bridgeport	005	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Torrington	NONE	001	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Voluntown	NONE	001	S	Hi-Vol	Gravimetric	6th day	Background	Regional
Wallingford	New Haven	001	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Waterbury	Waterbury	005	N	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Waterbury	Waterbury	006	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
Waterbury	Waterbury	007	N	Hi-Vol	Gravimetric	6th day	High Concentration	Neighborhood
Willimantic	NONE	002	S	Hi-Vol	Gravimetric	6th day	Population	Neighborhood
					LEAD			
Ansonia	Bridgeport	004	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Bridgeport	Bridgeport	009	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Bridgeport	Bridgeport	010	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Middle
Bridgeport	Bridgeport	123	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Bristol	Bristol	001	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Danbury	Danbury	002	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Hartford	Hartford	014	N	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood

TABLE 35, CONTINUED

1986 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale of Representativeness
					LEAD			
Hartford	Hartford	015	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Micro
Hartford	Hartford	016	N	Lo-Vol	Atomic Abs.	1 month	High Concentration	Micro
Meriden	Meriden	002	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Middletown	Hartford	003	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
New Britain	New Britain	007	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
New Haven	New Haven	018	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Middle
Norwalk	Norwalk	012	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Stamford	Stamford	001	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Stamford	Stamford	022	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Neighborhood
Wallingford	New Haven	001	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Waterbury	Waterbury	007	S	Hi-Vol	Atomic Abs.	6th day	Population	Neighborhood
Waterbury	Waterbury	123	S	Hi-Vol	Atomic Abs.	6th day	High Concentration	Middle
West Haven	New Haven	003	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Middle

TABLE 36

SUMMARY OF PROBE SITING CRITERIA

Pollutant	Spatial Scale	Distance from Supporting Structure (meters)		Height Above Ground (meters)	Other Spacing Criteria
		Vertical	Horizontal[a]		
TSP	All		>2	2 - 15	1. The sampler should be > 20 meters from any trees. 2. The distance from the sampler to an obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler.[b] 3. There must be unrestricted air flow 270 degrees around the sampler. 4. No furnace or incineration flues should be nearby.[c] 5. The sampler must have minimum spacing from roads. This varies with the height of the monitor and the spacial scale.
SO_2	All	3 - 15	>1	>1	1. The probe should be > 20 meters from any trees. 2. The distance from the inlet probe to an obstacle, such as a building, must be at least twice the height the obstacle protrudes above the inlet probe.[b] 3. There must be unrestricted air flow 270 degrees around the inlet probe, or 180 degrees if the probe is on the side of a building. 4. No furnace or incineration flues should be nearby.[c]
O_3	All	>1	>1	3 - 15	1. The probe should be > 20 meters from any trees. 2. The distance from the inlet probe to an obstacle, such as a building, must be at least twice the height the obstacle protrudes above the inlet probe. 3. There must be unrestricted air flow 270 degrees around the inlet probe, or 180 degrees if the probe is on the side of a building. 4. The spacing from roads varies with traffic.[d]

TABLE 36, CONTINUED

SUMMARY OF PROBE SITING CRITERIA

Pollutant	Spatial Scale	Distance from Supporting Structure (meters)		Height Above Ground (meters)	Other Spacing Criteria
		Vertical	Horizontal[a]		
CO	Micro	3±1/2	>1	>1	1. The probe must be >10 meters from any intersection and should be at a midblock location. 2. The probe must be 2-10 meters from the edge of the nearest traffic lane. 3. There must be unrestricted airflow 180 degrees around the inlet probe.
	Middle Neighborhood	3 - 15	>1	>1	1. There must be unrestricted airflow 270 degrees around the inlet probe, or 180 degrees if the probe is on the side of a building. 2. The spacing from roads varies with traffic.[d]
NO_2	All	3 - 15	>1	>1	1. The probe should be > 20 meters from any trees. 2. The distance from the inlet probe to an obstacle, such as a building, must be at least twice the height the obstacle protrudes above the inlet probe.[b] 3. There must be unrestricted air flow 270 degrees around the inlet probe, or 180 degrees if the probe is on the side of a building. 4. The spacing from roads varies with traffic.[d]

[a] When the probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on the roof.

[b] Sites not meeting this criterion would be classified as middle scale.

[c] Distance is dependent upon height of furnace or incineration flue, type of fuel or waste burned, and quality of fuel (sulfur and ash content). This is to avoid undue influences from minor pollutant sources.

[d] Distance is dependent upon traffic ADT, pollutant, and spatial scale.

XII. EMISSIONS INVENTORY

The State of Connecticut maintains a computerized emissions inventory which contains a point source file of approximately 7,000 stationary industrial, commercial, and institutional sources of air pollution. Emissions from these sources are determined on the basis of actual operating data for 1986, such as actual fuel use and actual material throughputs, and with the help of pollutant emission factors contained in the Compilation of Air Pollutant Emission Factors, designated as EPA publication AP-42.

This inventory does not account for all the pollution sources in the state, however. There are a host of other industrial, commercial, agricultural, and human activities that account for most of the pollution emitted into Connecticut's air. These sources cannot be individually inventoried either because of their nature, or large numbers, or widespread occurrence, etc. In spite of this, the emissions from these so-called area souces can be quantified by various means. For example, motor vehicle emissions can be determined from Connecticut Department of Transportation figures on vehicle-miles travelled on interstate and local roads, and from EPA MOBILE 3 emission factors; commercial and residential fuel-burning emissions can be determined from U. S. Department of Energy data, census figures, and AP-42 emission factors; and national per capita emissions, which are available from EPA for a number of pollution-causing activities, can be used in conjunction with census figures to calculate emissions by town, county, region, etc.

The computerized point source inventory and the more indirectly arrived at, but much larger, area source inventory together provide a good picture of the pollutants that are emitted into Connecticut's air each year. Table 37 summarizes the actual in-state emissions of each of the five (5) major air pollutants in Connecticut -- TSP, SO_2, CO, NO_2 ,and volatile organic compounds or VOC, -- by county, for 1986. The table reveals two things. First, the most populous counties have the largest pollutant totals; second, excluding SO_2, which is largely generated by utilities, area sources (mobile sources in particular) account for the bulk of the total emissions.

County names and geographic locations are displayed in Figure 32, which also serves as a reference for the charts that follow.

Figures 33 through 47 give various visual displays of the level of emissions for each of the major air pollutants. Figures 33, 36, 39, 42, and 45 are pie charts that show the percent of each air pollutant for Connecticut's eight (8) counties. Figures 34, 37, 40, 43, and 46 are pictorial displays of emissions by county, where the darker areas indicate higher emission levels. Figures 35, 38, 41, 44, and 47 are three dimensional graphs of each county's contribution to statewide emissions.

TABLE 37

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY

County	Sources	TONS PER YEAR OF EMISSIONS				
		TSP	SO_2	CO	VOC	NO_x[1]
Fairfield	Area	8,461.9	5,216.6	118,652.2	30,023.0	27,397.4
	Point	2,249.8	31,312.9	4,071.1	3,822.7	15,248.1
	All	10,711.7	36,529.5	122,723.3	33,845.7	42,645.5
Hartford	Area	9,396.8	5,621.4	124,365.3	31,240.8	28,904.0
	Point	765.5	3,579.3	490.1	3,935.7	2,865.9
	All	10,162.3	9,200.7	124,855.4	35,176.5	31,769.9
Litchfield	Area	2,539.2	945.4	27,077.1	6,699.1	5,376.6
	Point	164.8	689.5	60.2	834.9	262.4
	All	2,704.0	1,634.9	27,137.3	7,534.0	5,639.0
Middlesex	Area	2,295.1	864.3	25,518.5	6,148.0	5,574.7
	Point	772.9	8,361.8	585.9	683.4	8,379.5
	All	3,068.0	9,226.1	26,104.4	6,831.4	13,954.2
New Haven	Area	8,188.9	4,496.1	97,727.4	26,004.4	23,859.4
	Point	1,559.6	27,170.8	993.3	4,935.2	8,128.1
	All	9,748.5	31,666.9	98,720.7	30,939.6	31,987.5
New London	Area	3,908.8	1,623.0	47,093.7	11,341.4	10,079.2
	Point	980.2	12,717.4	454.0	2,771.0	4,017.5
	All	4,889.0	14,340.4	47,547.7	14,112.4	14,096.7
Tolland	Area	2,124.5	752.0	23,953.0	5,652.2	5,289.5
	Point	113.9	840.1	43.3	115.7	288.8
	All	2,238.4	1,592.1	23,996.3	5,767.9	5,578.3
Windham	Area	1,874.7	582.7	19,246.6	4,288.1	3,689.2
	Point	239.8	474.7	840.4	464.9	306.9
	All	2,114.5	1,057.4	20,087.0	4,753.0	3,996.1
TOTAL	Area	38,789.8	20,101.5	483,634.2	121,397.0	110,170.1
	Point	6,846.5	85,146.6	7,538.3	17,563.5	39,497.1
	All	45,636.3	105,248.1	491,172.5	138,960.5	149,667.2

[1] NO_x emissions are expressed as NO_2.

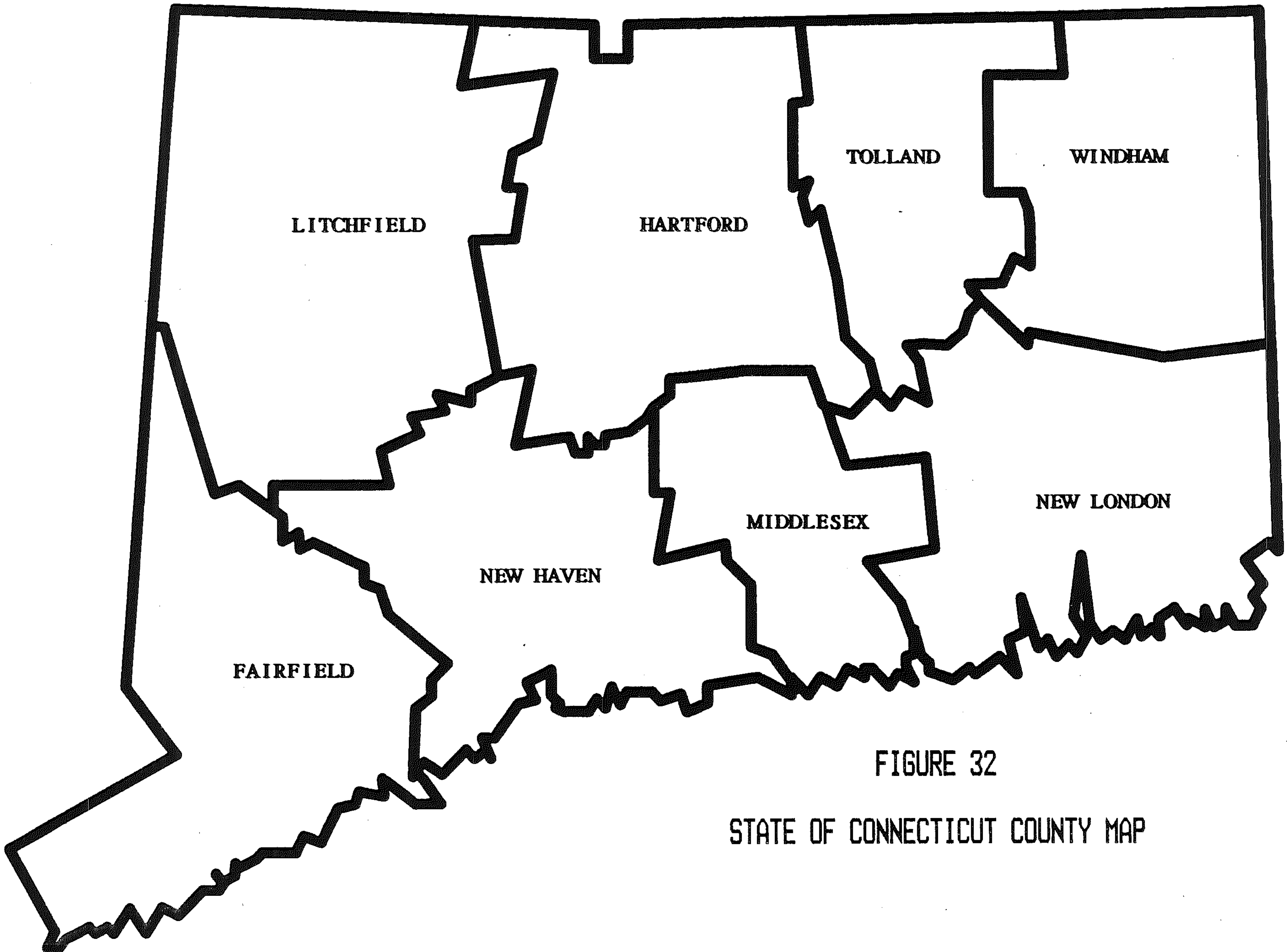


FIGURE 32

STATE OF CONNECTICUT COUNTY MAP

FIGURE 33

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY TOTAL SUSPENDED PARTICULATES

(TOTAL TONS PER YEAR : 45,636)

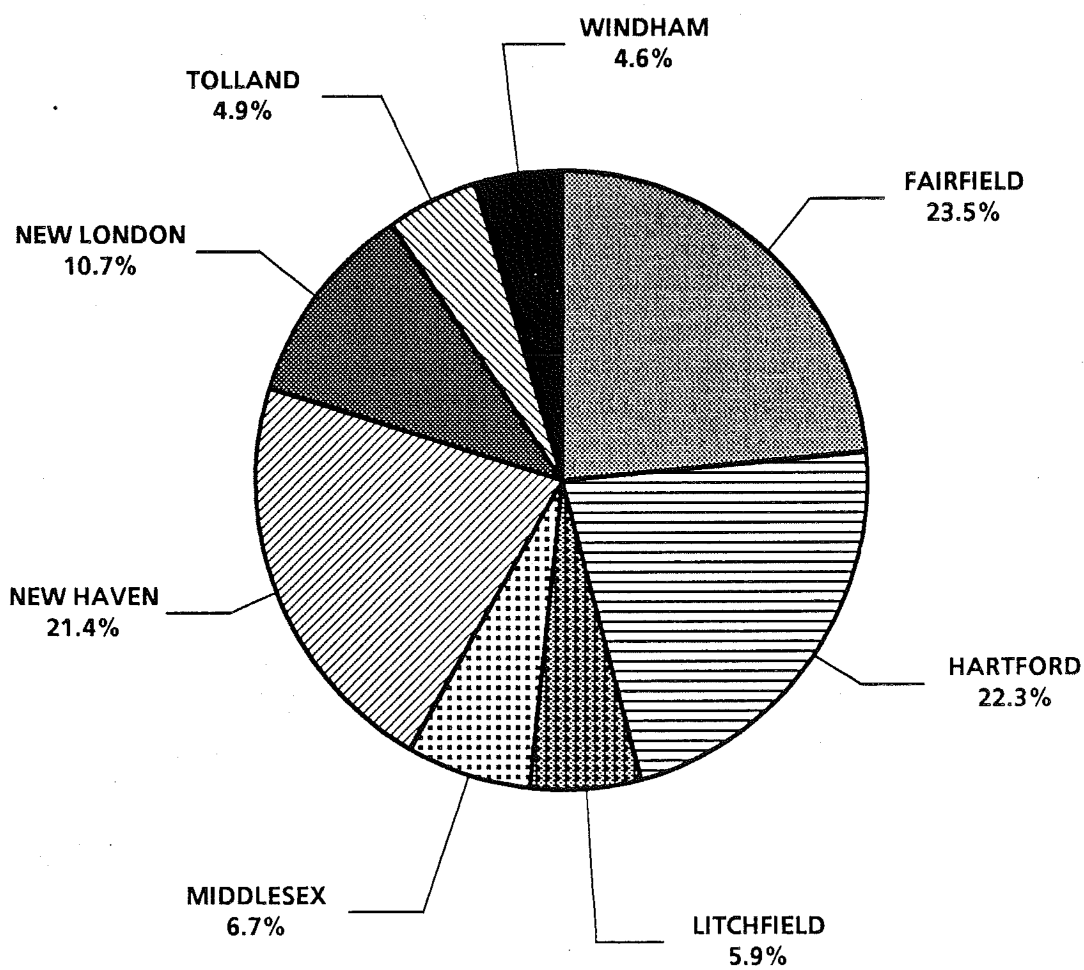


FIGURE 34

1986 TOTAL SUSPENDED PARTICULATES

Total Emissions by County

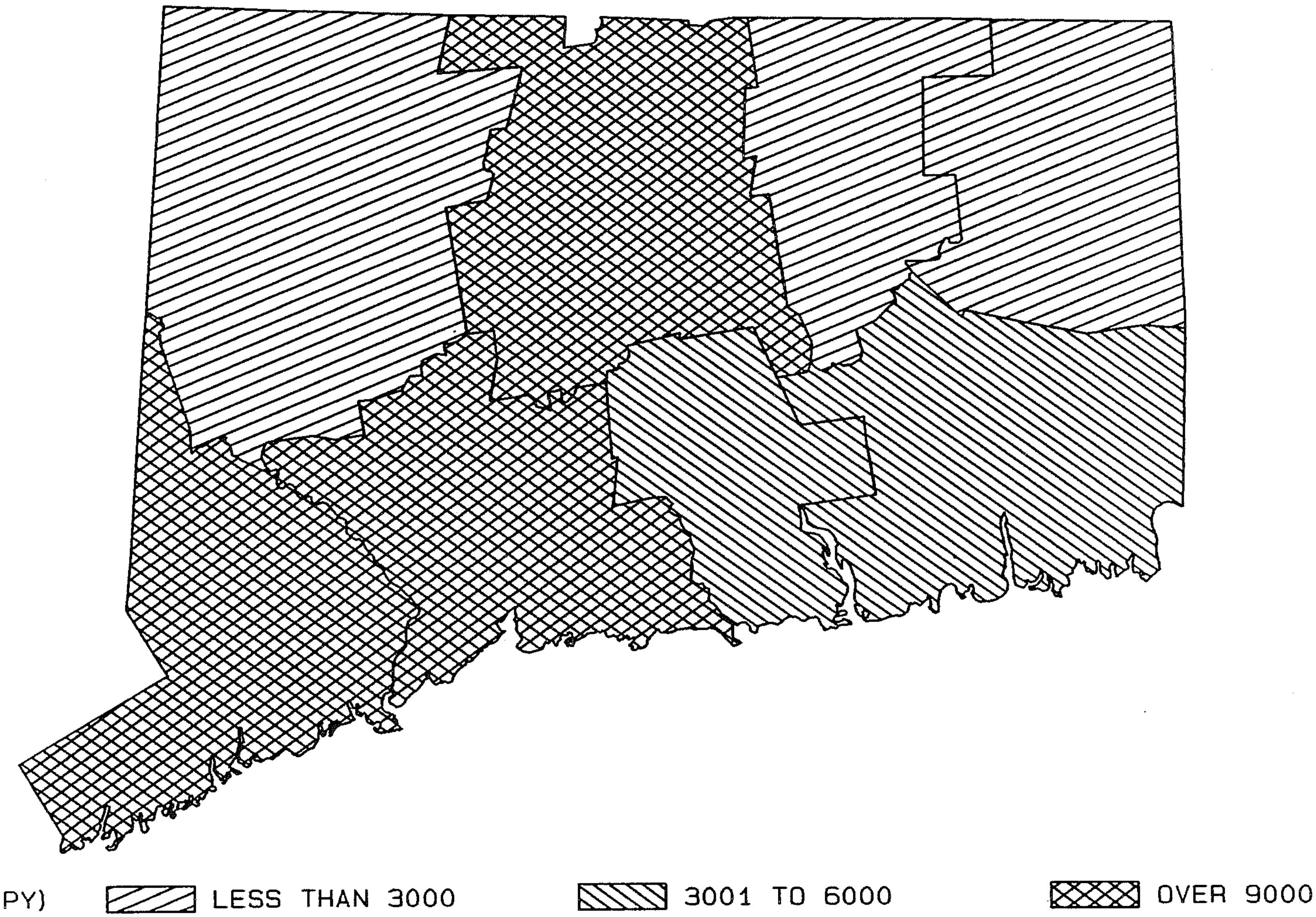
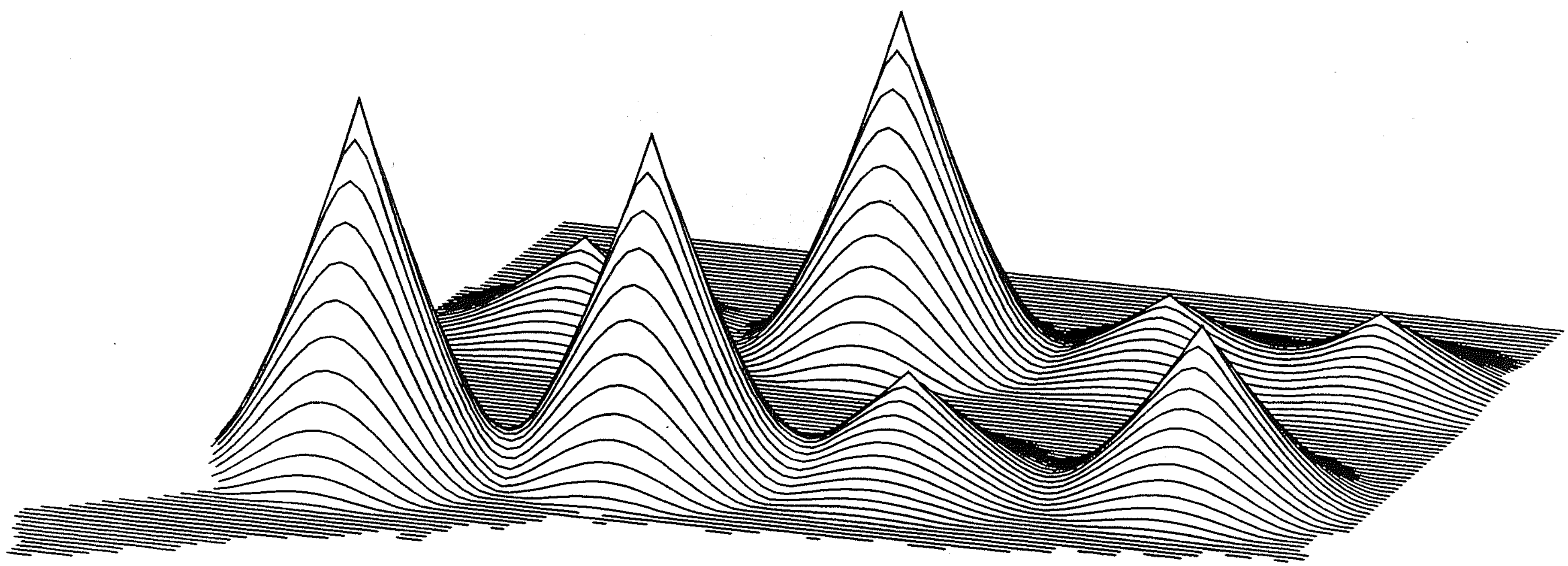


FIGURE 35

1986 TOTAL SUSPENDED PARTICULATES

Total Emissions by County



Three Dimensional View of TSP Emissions

FIGURE 36

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY SULFUR DIOXIDE

(TOTAL TONS PER YEAR : 105,248)

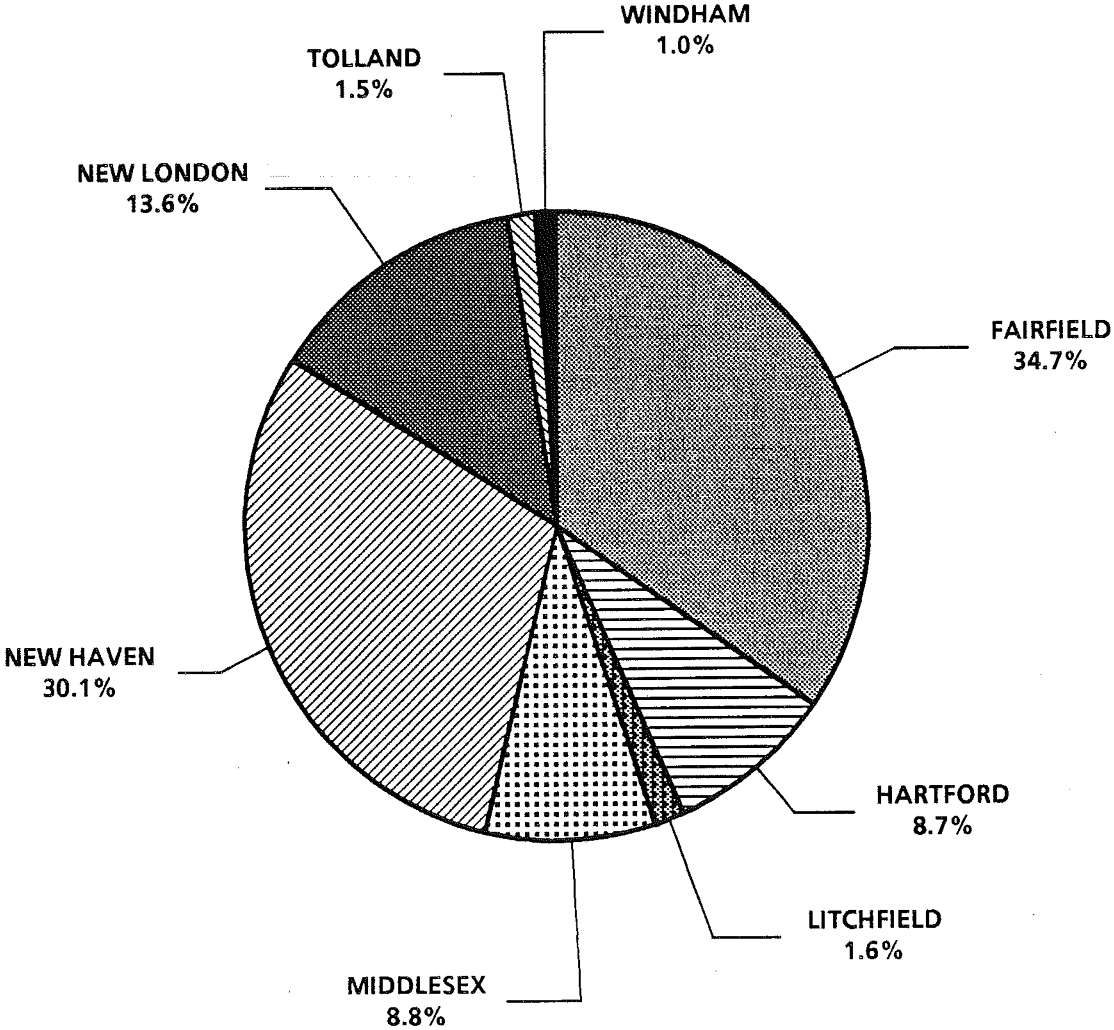
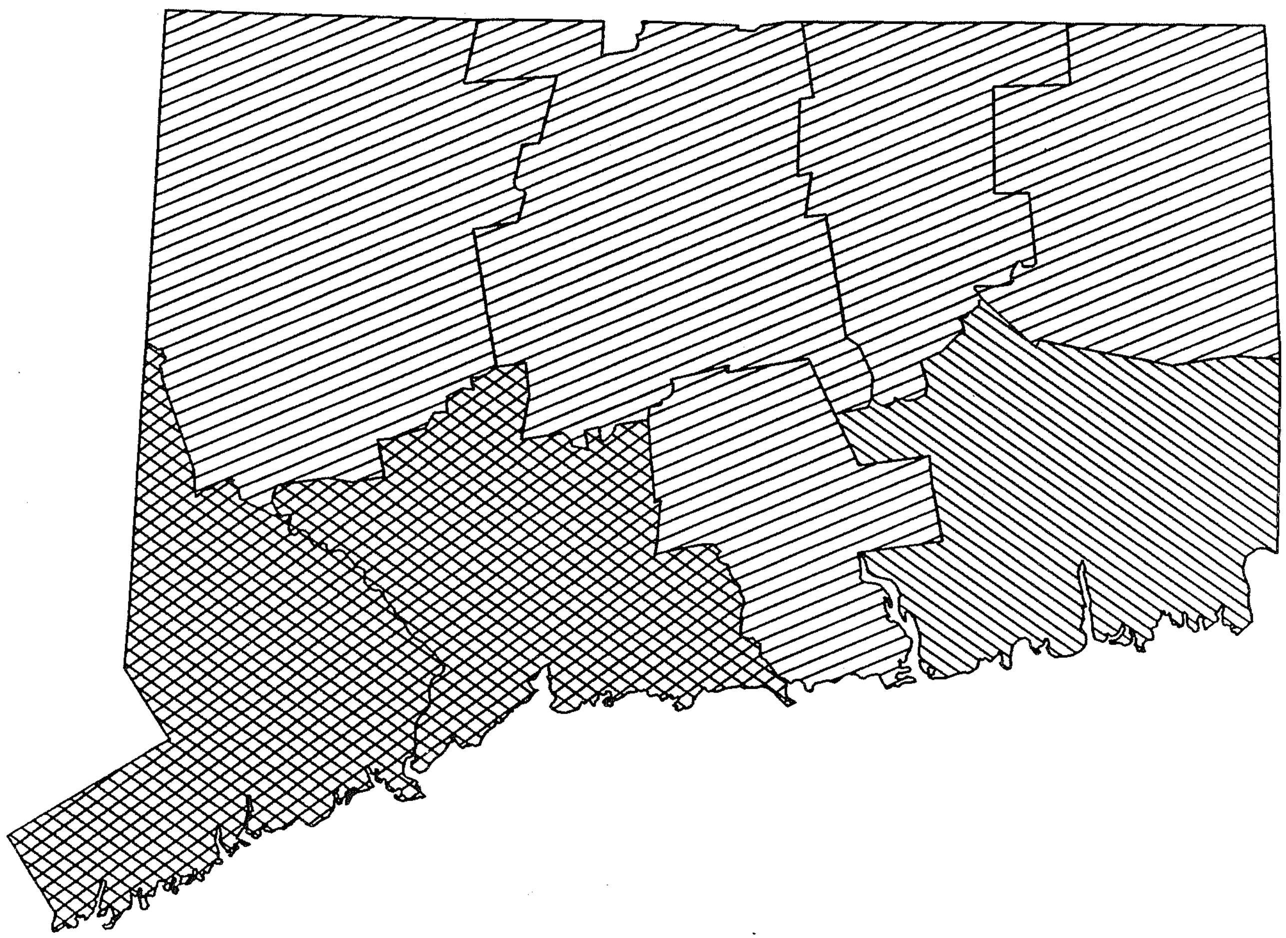


FIGURE 37

1986 SULFUR DIOXIDE

Total Emissions by County

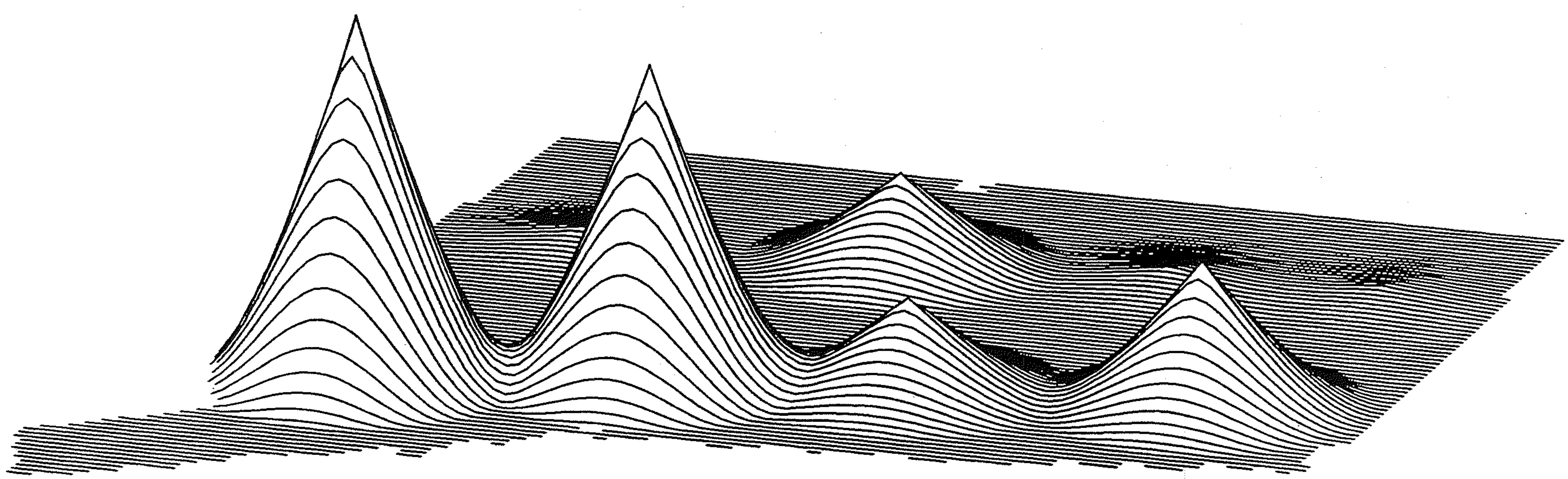


ACTUAL SO2 (TPY) — LESS THAN 10,000 — 10,001 TO 20,000 — OVER 30,000

FIGURE 38

1986 SULFUR DIOXIDE

Total Emissions by County



Three Dimensional View of SO2 Emissions

FIGURE 39

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY CARBON MONOXIDE

(TOTAL TONS PER YEAR : 491,173)

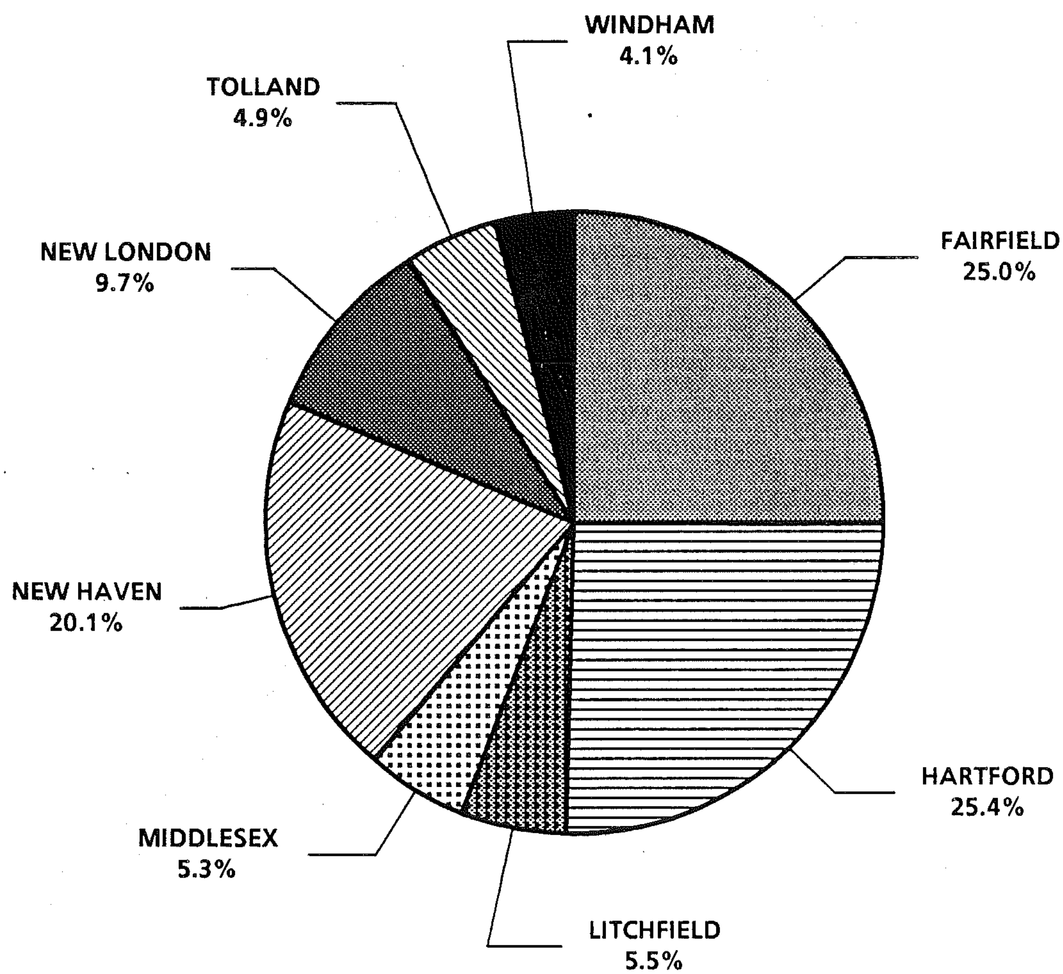


FIGURE 40

1986 CARBON MONOXIDE

Total Emissions by County

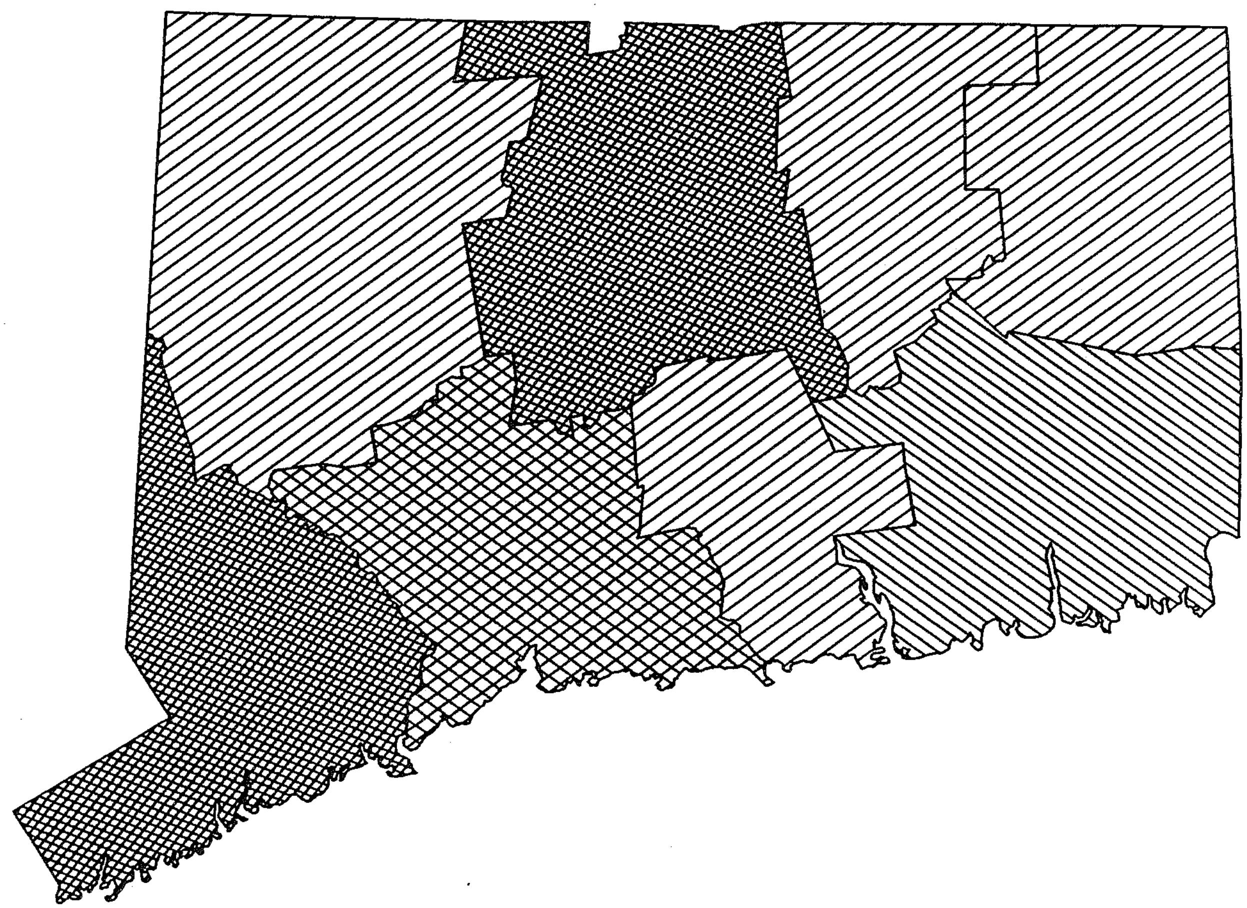
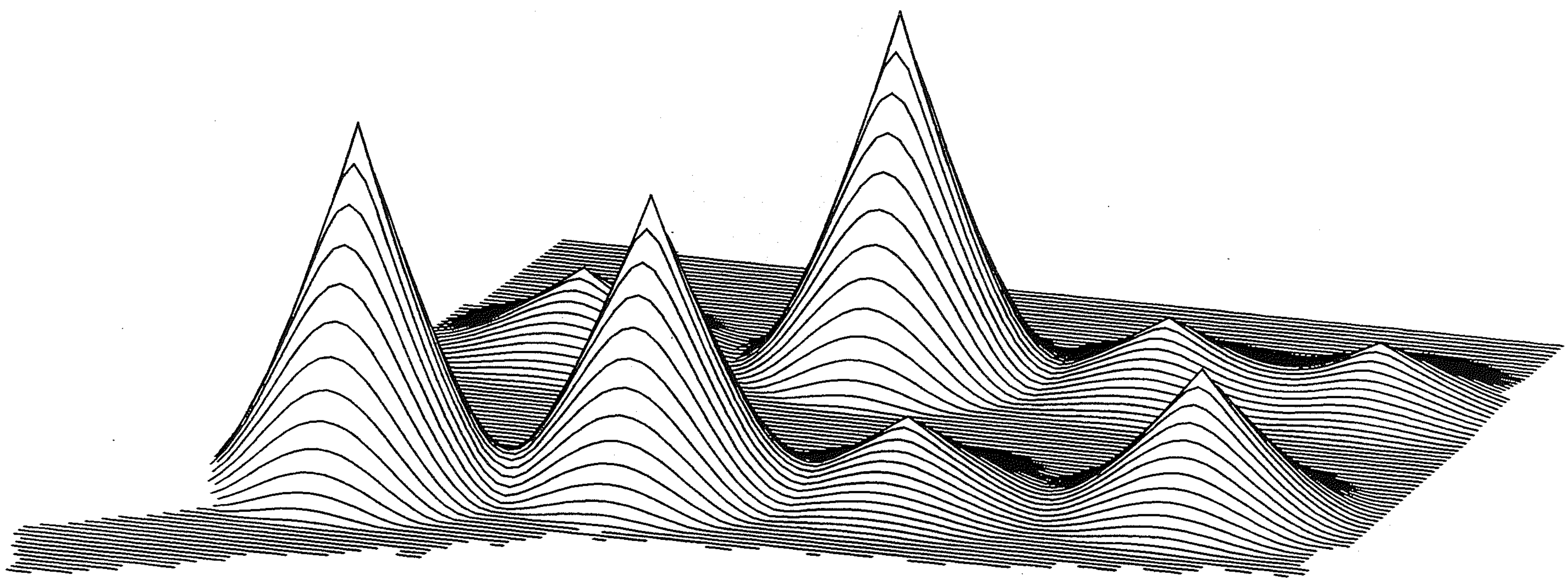


FIGURE 41

1986 CARBON MONOXIDE

Total Emissions by County



Three Dimensional View of CO Emissions

FIGURE 42

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY VOLATILE ORGANIC COMPOUNDS

(TOTAL TONS PER YEAR :138,961)

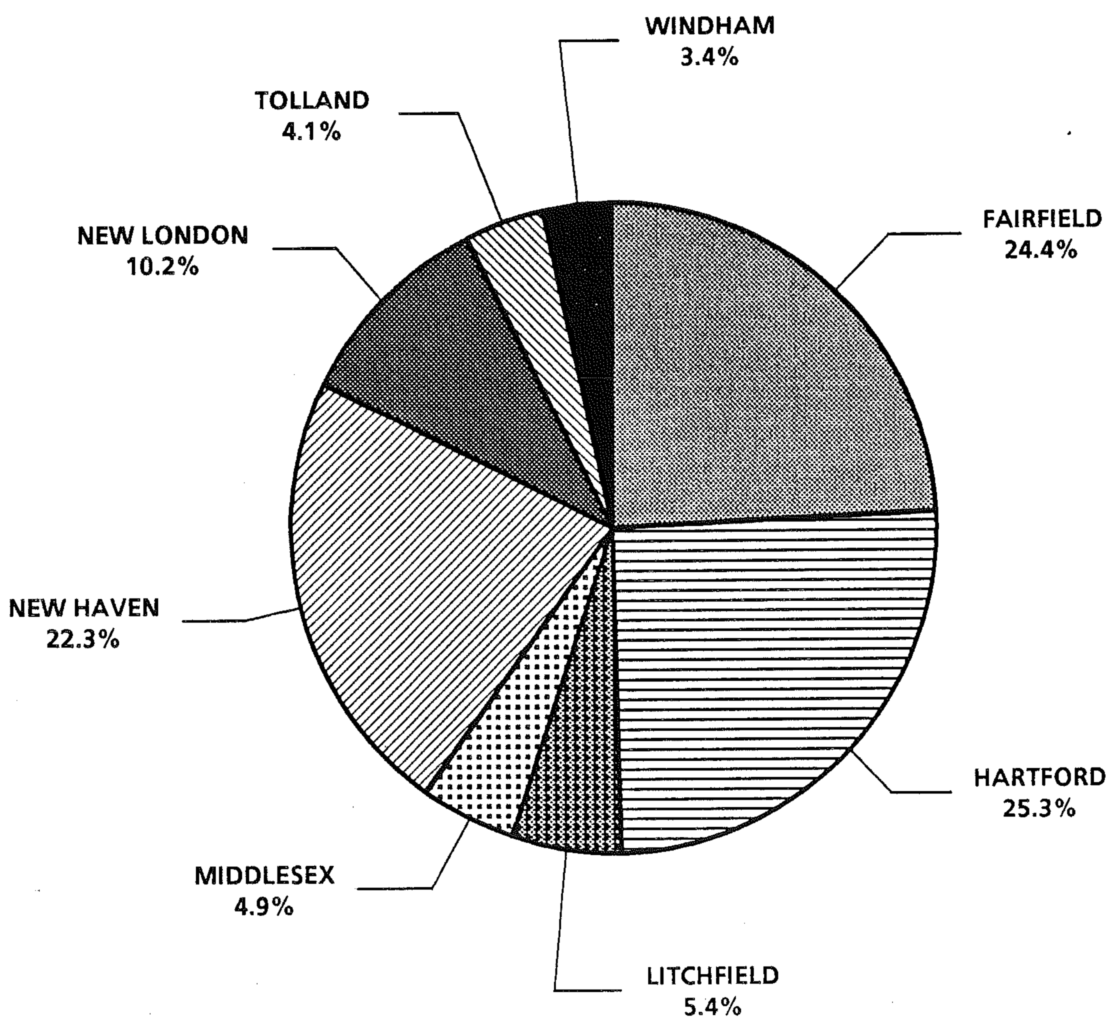


FIGURE 43

<u>1986 VOLATILE ORGANIC COMPOUNDS</u>

Total Emissions by County

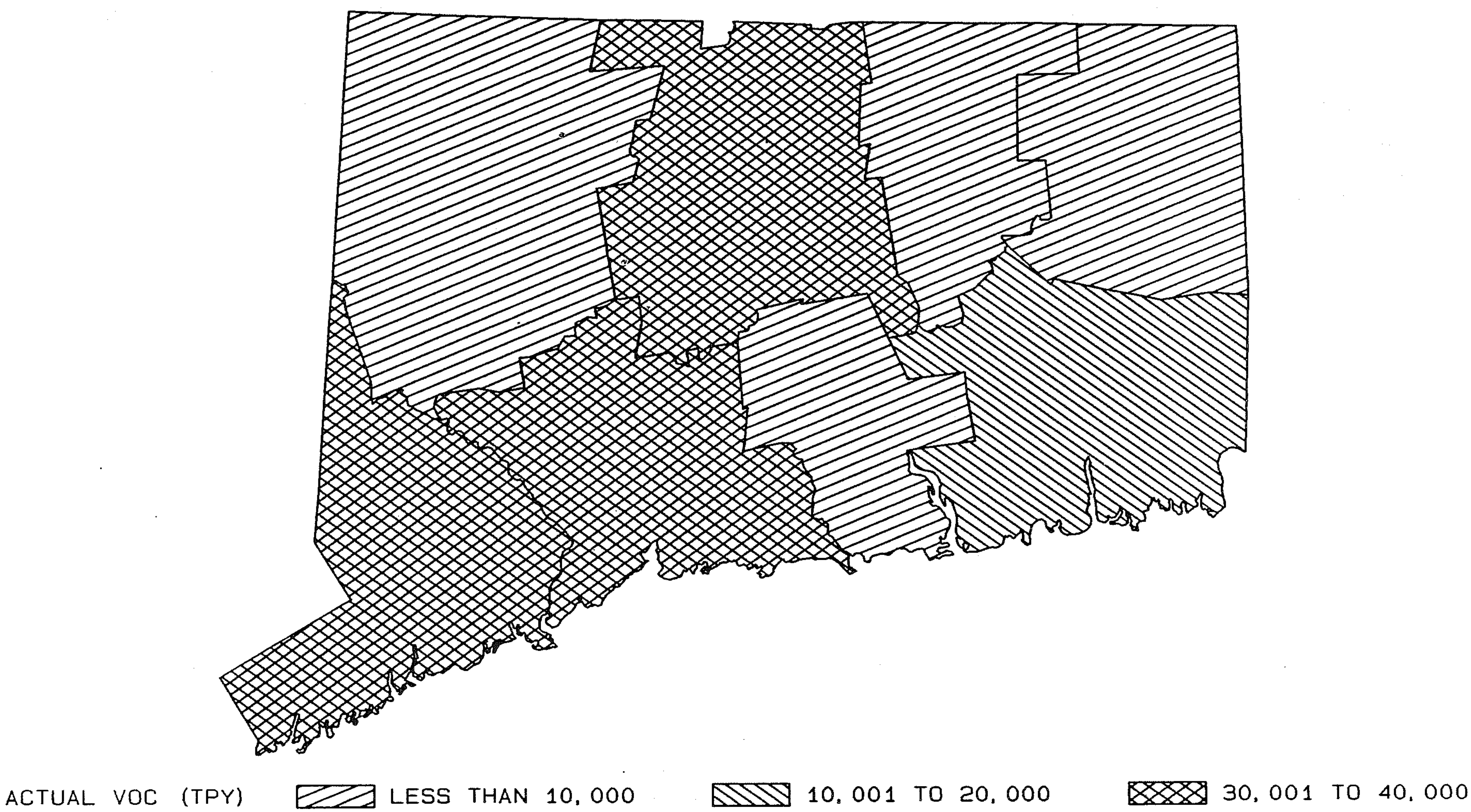
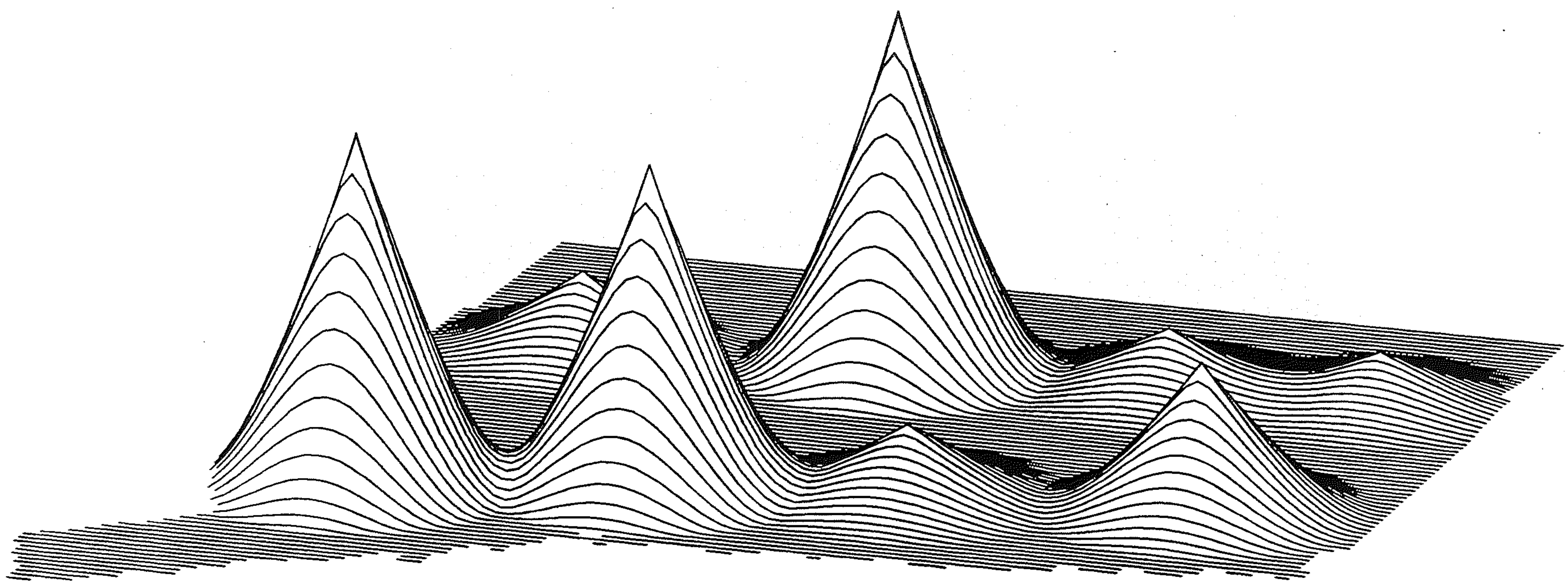


FIGURE 44

1986 VOLATILE ORGANIC COMPOUNDS

Total Emissions by County



Three Dimensional View of VOC Emissions

FIGURE 45

1986 CONNECTICUT EMISSIONS INVENTORY BY COUNTY
NITROGEN OXIDES

(Expressed as Nitrogen Dioxide)

(TOTAL TONS PER YEAR : 138,961)

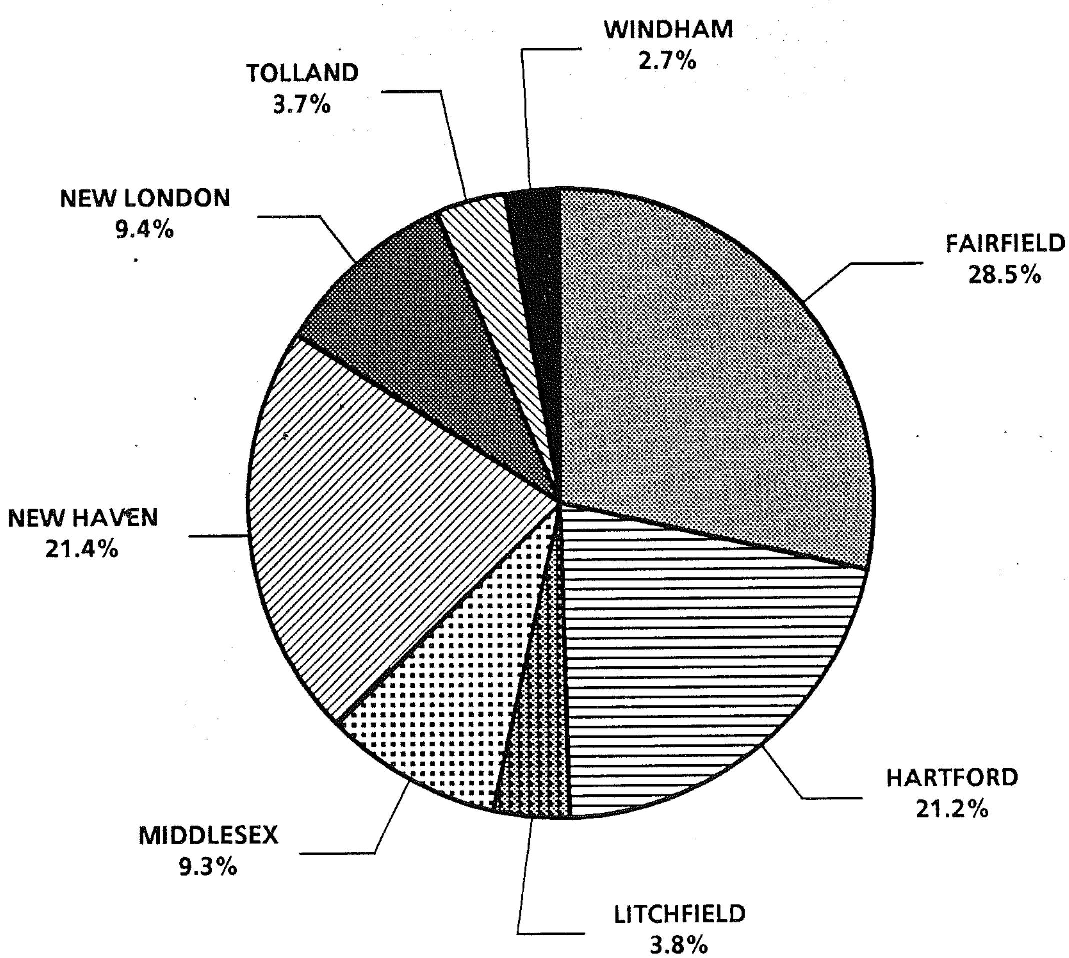


FIGURE 46

1986 NITROGEN OXIDES

(Expressed as Nitrogen Dioxide)

Total Emissions by County

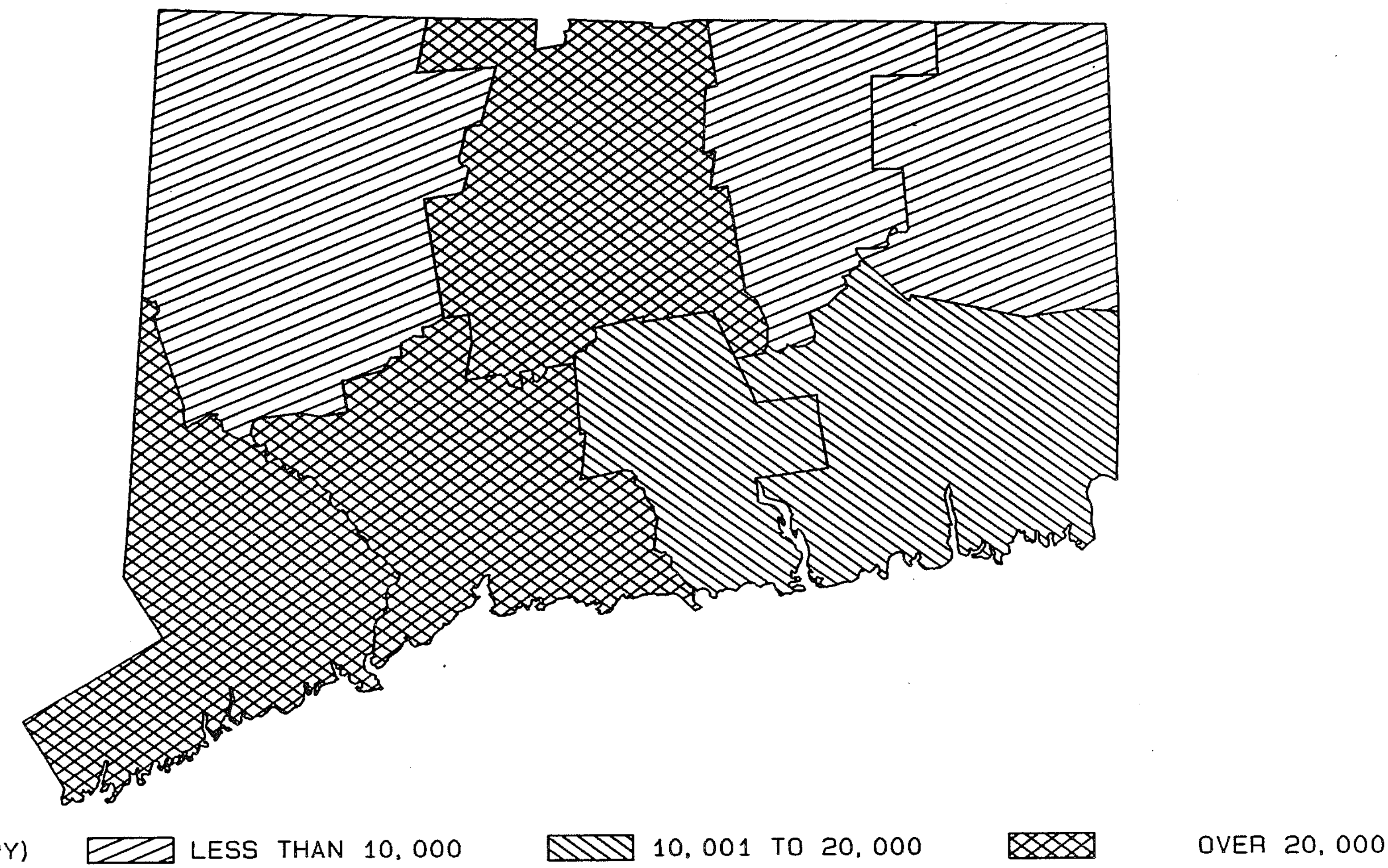
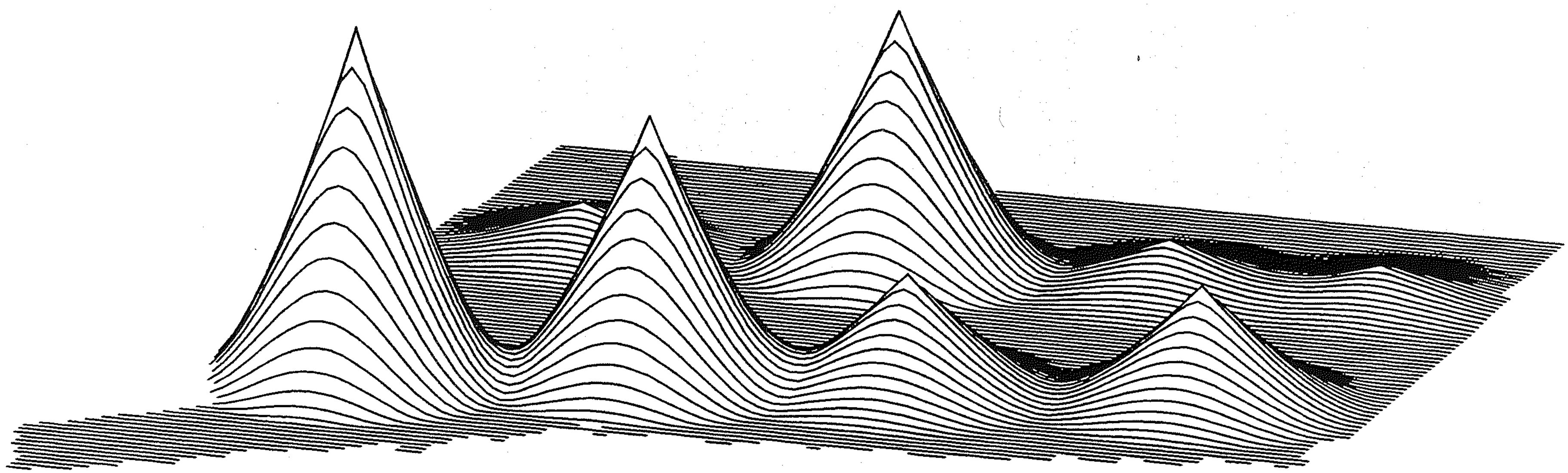


FIGURE 47

1986 NITROGEN OXIDES

(Expressed as Nitrogen Dioxide)

Total Emissions by County



Three Dimensional View of NOx Emissions

XIII. PUBLICATIONS

The following is a partial listing of technical papers and study reports dealing with various aspects of Connecticut air pollutant levels and air quality data.

1. Bruckman, L., ***Asbestos: An Evaluation of Its Environmental Impact in Connecticut***, internal report issued by the Connecticut Department of Environmental Protection, Hartford, Connecticut, March 12, 1976.

2. Lepow, M. L., L. Bruckman, R.A. Rubino, S. Markowitz, M. Gillette and J. Kapish, ***"Role of Airborne Lead in Increased Body Burden of Lead in Hartford Children,"*** Environ. Health Perspect., May, 1974, pp. 99-102.

3. Bruckman, L. and R.A. Rubino, ***"Rationale Behind a Proposed Asbestos Air Quality Standard,"*** paper presented at the 67th Annual Meeting of the Air Pollution Control Association, Denver, Colorado, June 9-11, 1974, J. Air Pollut. Cntr. Assoc., 25: 1207-15 (1975).

4. Rubino, R.A., L. Bruckman and J. Magyar, ***"Ozone Transport,"*** paper presented at the 68th Annual Meeting of the Air Pollution Control Association, Boston, Massachusetts, June 15-20, 1975, J. Air Pollut. Cntr. Assoc.: 26, 972-5 (1976).

5. Bruckman, L., R.A. Rubino and T. Helfgott, ***"Rationale Behind a Proposed Cadmium Air Quality Standard,"*** paper presented at the 68th Annual Meeting of the Air Pollution Control Association, Boston, Massachusetts, June 15-20, 1975.

6. Rubino, R.A., L. Bruckman, A. Kramar, W. Keever and P. Sullivan, ***"Population Density and Its Relationship to Airborne Pollutant Concentrations and Lung Cancer Incidence in Connecticut,"*** paper presented at the 68th Annual Meeting of the Air Pollution Control Association, Boston, Massachusetts, June 15-20, 1975.

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XIV. ERRATA

During the preparation of this document, a number of errors were discovered and corrected. In order to inform the reader of these changes and to prevent any confusion in the mind of the reader over conflicting data presented in this and previous editions of this document, the errors and corrections are presented below:

- Regarding the 1985 Air Quality Summary,

1. In Section I, on page 2, the first paragraph pertaining to carbon monoxide should indicate that the carbon monoxide standard was exceeded at only 2 sites; that there was one exceedance at Stamford 020 and five exceedances at Hartford 017; that the 8-hour standard was violated at only Hartford 017 in 1985; and that violations of the standard occurred at both Hartford 017 and Stamford 020 in 1984.

2. In Section I, on page 4, Table 2 should show no exceedances of the 8-hour CO standard at Bridgeport 004.

3. In Section I, on page 10, Figure 2 should show the number of sites in 1985 to be 17. And the numbers in the bar segments for 1985 should be 18%, 60%, and 18%.

4. In Section III, on page 99, Table 12 should show the annual average for New Haven 017 to be 37 $\mu g/m^3$.

5. In Section III, on page 100, Table 13 should show the following statistics for Bridgeport 123 in 1985: 355 samples; an arithmetic mean of 30.8 $\mu g/m^3$; a standard deviation of 24.961; and upper and lower 95 percent confidence limits of 31 and 30 $\mu g/m^3$, respectively.

6. In Section III, on page 102, Table 14 should show the first high at Bridgeport 123 to be 124 $\mu g/m^3$ on 1/19 and the second high to be 114 $\mu g/m^3$ on 1/28.

7. In Section III, on page 104, Table 15 should show the first high calendar day average at Bridgeport 123 to be 124 $\mu g/m^3$; the second high calendar day average to be 114 $\mu g/m^3$; the first high running 24-hour average to be 141 $\mu g/m^3$; and the second high running 24-hour average to be 130 $\mu g/m^3$.

8. In Section III, on page 105, Table 16 should show the first high running 3-hour concentration at Bridgeport 123 to be 231 $\mu g/m^3$ on 8/10/12 and the second high concentration to be 224 $\mu g/m^3$ on 2/4/8.

9. In Section III, on page 107, the two highest concentrations in Table 17 for Bridgeport 123 should be deleted and the number of samples should be changed from 358 to 355.

10. In Section IV, on page 116, the third paragraph should indicate that the number of days when ozone monitors measured levels in excess of the standard was 64 in 1985; that this translates to 4.3 occurrences per 100 sampling days in 1985; and that this represents a 49% decrease from 1984.