1985

STATE OF CONNECTICUT
ANNUAL AIR QUALITY SUMMARY

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I. INTRODUCTION

The 1985 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 constraints imposed on each.

The following section briefly describes the status of Connecticut's air quality for the year 1985. 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 1985. The primary 24-hour standard of 260 $\mu g/m^3$ was not exceeded at any site in 1985. However, the secondary 24-hour standard of 150 $\mu g/m^3$ was exceeded at two sites (see Table 2). 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 1985.

In general, measured TSP levels in Connecticut were higher in 1985, in terms of annual average concentration values, than they were in 1984 (see Table 3).

2. SULFUR DIOXIDE (SO_2)

None of the air quality standards for sulfur dioxide were exceeded in Connecticut in 1985. 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 1985 were not significantly different from those in 1984 (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 coastal Connecticut, 1985 was not appreciably warmer than 1984. 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 1984 to 1985.

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 1985 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 1985 (see Table 2).

The incidence of ozone levels in excess of the 1-hour 0.12 ppm ozone standard decreased significantly from 1984 to 1985 (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 μg/m³ was not exceeded at any site in Connecticut in 1985.

5. CARBON MONOXIDE (CO)

The primary eight-hour standard of 9 ppm was exceeded at ~~three~~ two of the five carbon monoxide monitoring sites in Connecticut during 1985 (see Table 2). The standard was exceeded ONCE ~~two times~~ at Stamford 020, ~~six~~ five times at Hartford 017 ~~and once at Bridgeport 004~~. Two exceedances at a particular site are required for a standard to be violated. This means that the eight-hour standard was violated at ~~Stamford 020 and~~ Hartford 017 in 1985. ~~This was also the case~~ VIOLATIONS OCCURRED in 1984. AT BOTH HARTFORD 017 AND STAMFORD 020.

There were no violations of the primary one-hour standard of 35 ppm in 1985.

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 1985 BASED ON MEASURED CONCENTRATIONS

		OZONE Level Exceeding 1-Hour Standard		CARBON MONOXIDE Level Exceeding 8-Hour Standard		PARTICULATES Level Exceeding Secondary 24-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	Highest Observed Level (µg/m3)	Number of Times Standard Exceeded
Bridgeport	004	-	-	~~9.2~~	~~1~~	-	-
Bridgeport	123	0.196	4	-	-	-	-
Danbury	123	0.149	4	-	-	-	-
East Hartford	003	0.149	3	-	-	-	-
Greenwich	017	0.171	13	-	-	-	-
Groton	008	0.184	9	-	-	-	-
Hartford	017	-	-	12.2	~~6~~ 5	-	-
Madison	002	0.204	7	-	-	-	-
Middletown	007	0.219	10	-	-	-	-
New Haven	123	0.181	6	-	-	-	-
Norwich	002	-	-	-	-	159	1
Stafford	001	0.166	4	-	-	-	-
Stamford	001	-	-	-	-	165	1
Stamford	020	-	-	10.2	~~2~~ 1	-	-
Stratford	007	0.189	13	-	-	-	-

- : The pollutant is not monitored at the site.

6. LEAD (Pb)

The primary and secondary ambient air quality standard for lead is 1.5 $\mu g/m^3$,maximum arithmetic mean averaged over three consecutive calendar months. As was the case in 1984, the lead standard was not exceeded at any site in Connecticut during 1985.

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 1975-1985 total suspended particulate (TSP) data and to 1978-1985 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 remained relatively constant from 1975 to 1977, decreased from 1977 to 1978, and remained unchanged from 1978 to 1979. Between 1979 and 1980 there was a significant drop in measured TSP levels. This has been attributed to the elimination of passive sampling error through the use of retractable lids on the hi-vol monitors. TSP levels alternately decreased and increased significantly from 1980 to 1984. From 1984 to 1985, TSP levels showed a significant increase at the 95% confidence level.

TABLE 3

TSP TRENDS: 1975 -1985
(PAIRED *t* TEST)

PAIRED YEARS	NUMBER OF SITES	AVERAGE OF ANNUAL GEOMETRIC MEANS ($\mu g/m^3$)	STANDARD DEVIATION ($\mu g/m^3$)	SIGNIFICANCE LEVEL: TREND AT 95% LEVEL	TREND AT 99% LEVEL	PROBABILITY THAT CHANGE IS NOT SIGNIFICANT
75	29	53.3	9.8			
76	29	53.3	9.5	N.C.	N.C.	0.9588
76	35	53.6	8.8			
77	35	53.7	9.2	N.C.	N.C.	0.8715
77	30	54.8	9.8			
78	30	52.7	9.3	↓	N.C.	0.0216
78	32	51.4	12.1			
79	32	49.9	12.5	N.C	N.C.	0.1530
79	32	49.3	13.2			
80	32	45.4	10.0	↓	↓	0.0001
80	26	45.2	10.1			
81	26	38.0	8.4	↓	↓	0.0001
81	37	38.3	6.8			
82	37	40.5	8.0	↑	↑	0.0001
82	36	41.3	7.3			
83	36	39.5	6.7	↓	↓	0.0001
83	38	39.6	6.7			
84	38	40.5	6.5	↑	↑	0.0008
84	36	40.7	6.3			
85	36	41.9	7.5	↑	N.C.	0.0141

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

TABLE 4

SO2 TRENDS FROM CONTINUOUS DATA: 1978 -1985

(PAIRED t TEST)

PAIRED YEARS	NUMBER OF SITES	AVERAGE OF ANNUAL GEOMETRIC MEANS ($\mu g/m^3$)	STANDARD DEVIATION ($\mu g/m^3$)	SIGNIFICANCE LEVEL: TREND AT 95% LEVEL	TREND AT 99% LEVEL	PROBABILITY THAT CHANGE IS NOT SIGNIFICANT
78	9	23.8	6.1			
79	9	21.3	5.3	N.C	N.C.	0.1238
79	10	21.8	4.5			
80	10	19.8	5.2	↓	N.C.	0.0215
80	8	21.1	4.1			
81	8	20.9	4.4	N.C.	N.C.	0.9100
81	8	20.9	4.4			
82	8	21.0	4.5	N.C.	N.C.	0.9522
82	8	20.0	5.0			
83	8	18.1	5.1	↓	↓	0.0002
83	8	18.1	5.1			
84	8	18.2	4.5	N.C.	N.C.	0.9237
84	~~15~~ 14	~~16.4~~ 16.3	~~4.4~~ 4.5			0.6753
85	~~15~~ 14	~~16.5~~ 16.7	~~4.9~~ 5.0	N.C.	N.C.	~~0.9654~~

Key to Symbols : ↓ = Significant downward trend

↑ = Significant upward trend

N.C. = No significant change

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, 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.

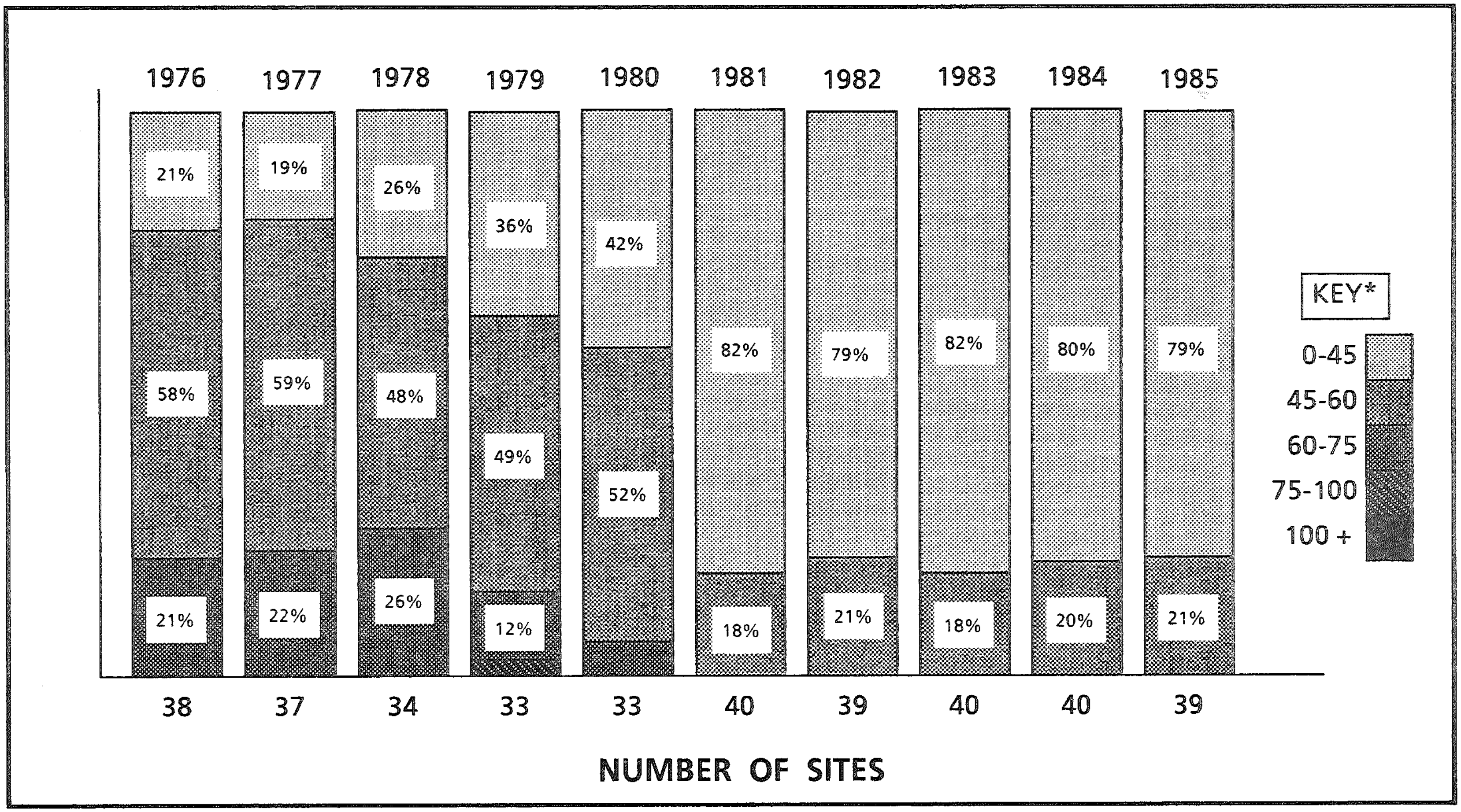
In order to perform a valid trend analysis, the data for the period of interest must be adequate, reliable and from similar sampling methods. Up until 1978, the only method which consistently fit these criteria was the sulfation plate. Between 1978 and 1982 there were approximately three times as much 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 1976-1985 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 1976-1977 or the period 1977-1978 because the number of monitors that operated for the duration of each period was 2 and 3, respectively -- 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

FIGURE 1

TOTAL SUSPENDED PARTICULATE MATTER TREND

"PERCENT OF SITES WITHIN EACH RANGE"



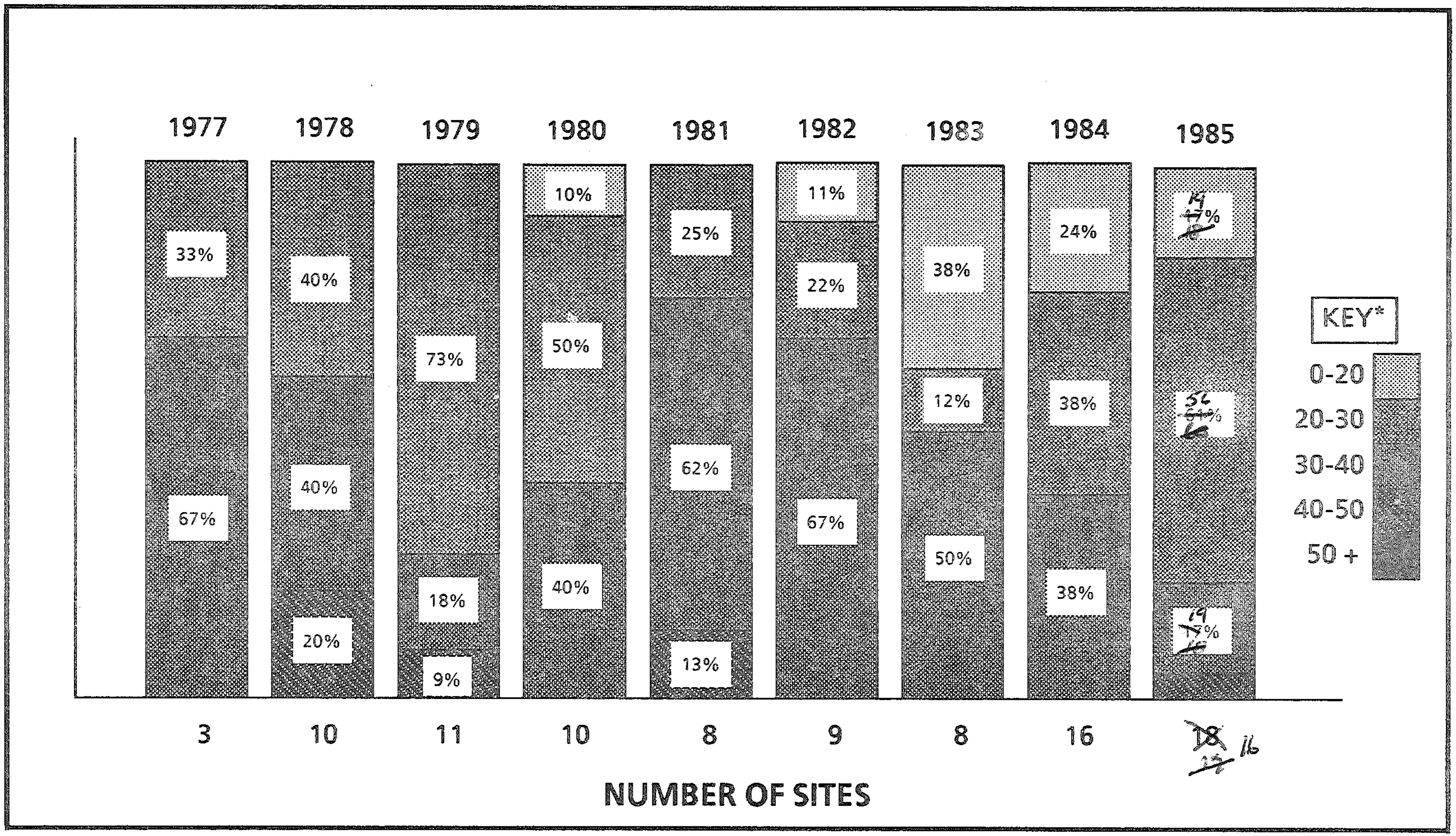
PRIMARY ANNUAL STANDARD = 75 µg/m³
SECONDARY ANNUAL STANDARD = 60 µg/m³

* ANNUAL GEOMETRIC MEAN (µg/m³)

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)

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; and in 1983 SO_2 levels actually declined (see Table 4). This may be attributable to the year-to-year fluctuations in meteorology or the decreased fuel use caused by the increased price of this energy source.

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.

Continuous SO_2 monitors were operated each year at five (5) sites between 1980 and 1985. Based on measurements at these five (5) locations, mean SO_2 levels are depicted in Figures 2A and 2B. Figure 2A shows SO_2 levels clearly decreasing at the Bridgeport, Danbury and Hartford sites. Figure 2B shows the average of the mean SO_2 concentrations for all the sites steadily decreasing over the 5-year period. Figure 2C is a linear regression analysis of this data which also shows a downward trend in SO_2 levels since 1980. Using the data presented in Figure 2B, Figure 2D shows the three-year running average of the mean SO_2 concentrations. Three-year running averages tend to smooth out the year-to-year effects of meteorology on pollutant levels. Like Figures 2A, 2B and 2C, Figure 2D illustrates again that SO_2 levels appear to be decreasing. This long term trend analysis also demonstrates that SO_2 levels are declining even though fuel burning sources have been allowed to use 1% sulfur oil since 1982.

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, Preston, Stafford, Stamford, Stratford and Waterbury.

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).

FIGURE 2A

ANNUAL GEOMETRIC MEAN CONCENTRATIONS OF SO2 (PPB) FOR 1980-1985 AT EACH OF FIVE CONCURRENTLY OPERATING SITES

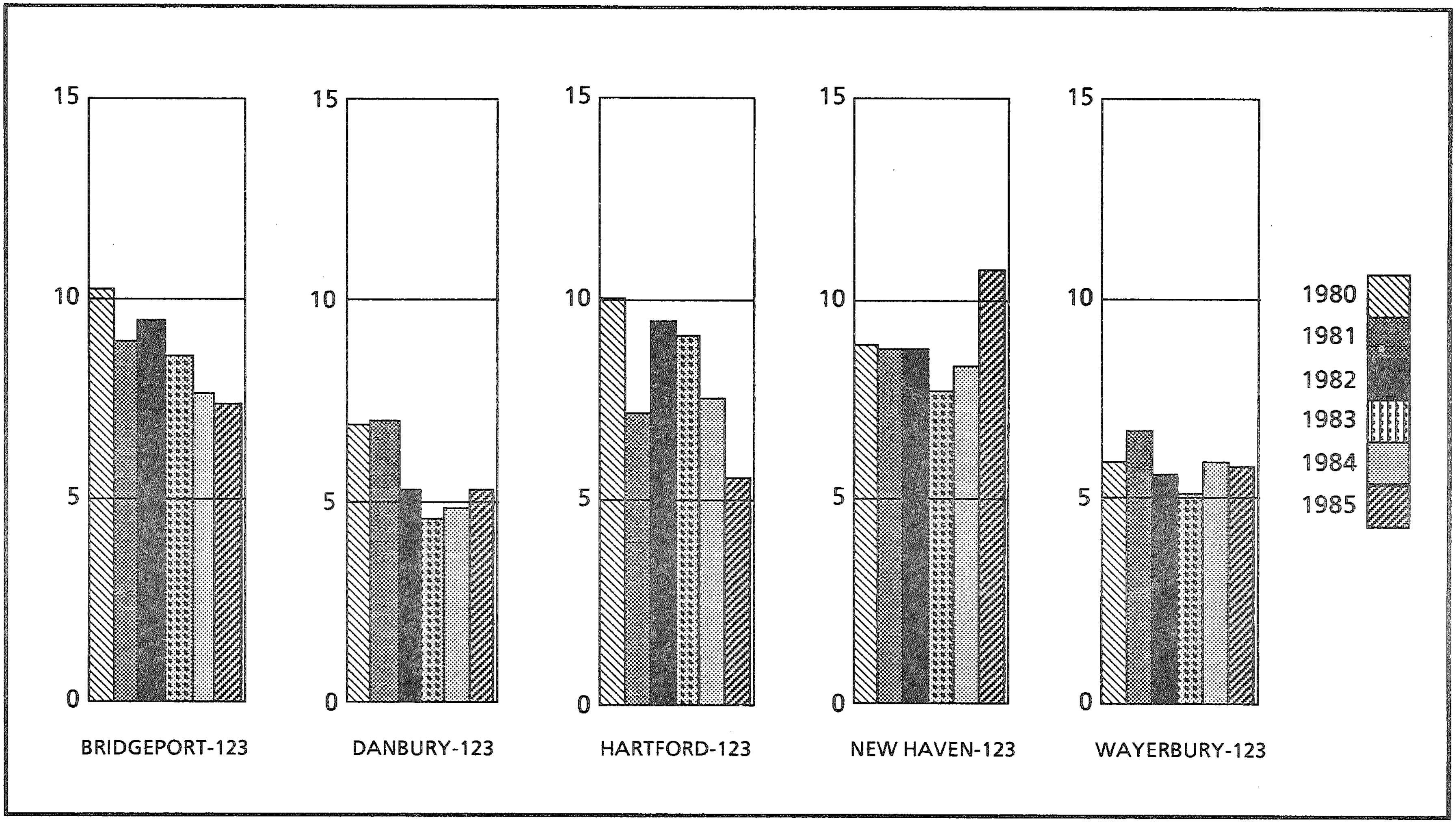


FIGURE 2B

THE AVERAGE OF THE ANNUAL GEOMETRIC MEAN SO2 CONCENTRATIONS AT FIVE CONCURRENTLY OPERATING SITES

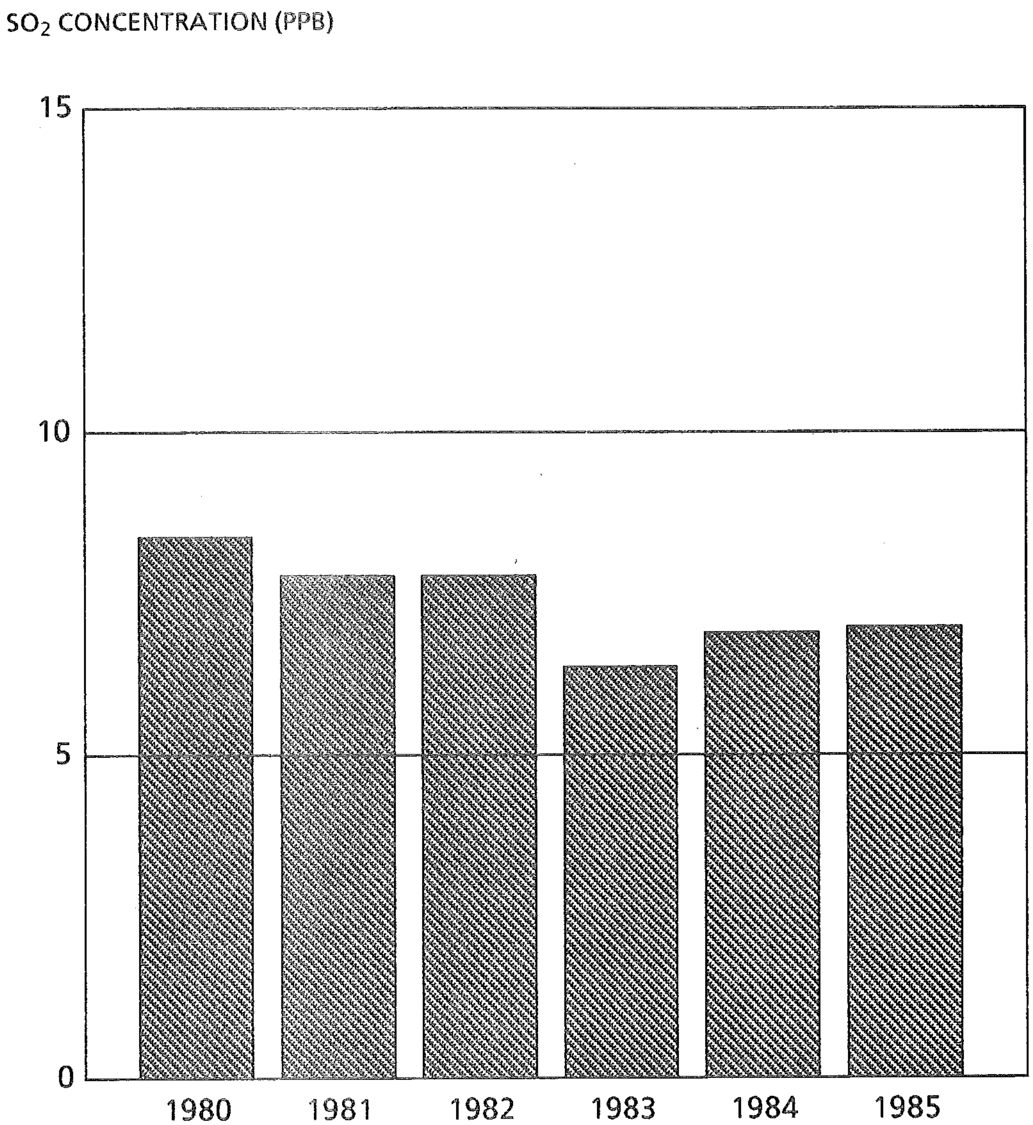


FIGURE 2C

TREND OF THE ANNUAL GEOMETRIC MEAN SO2 CONCENTRATIONS AT FIVE CONCURRENTLY OPERATING SITES FOR 1980-1985

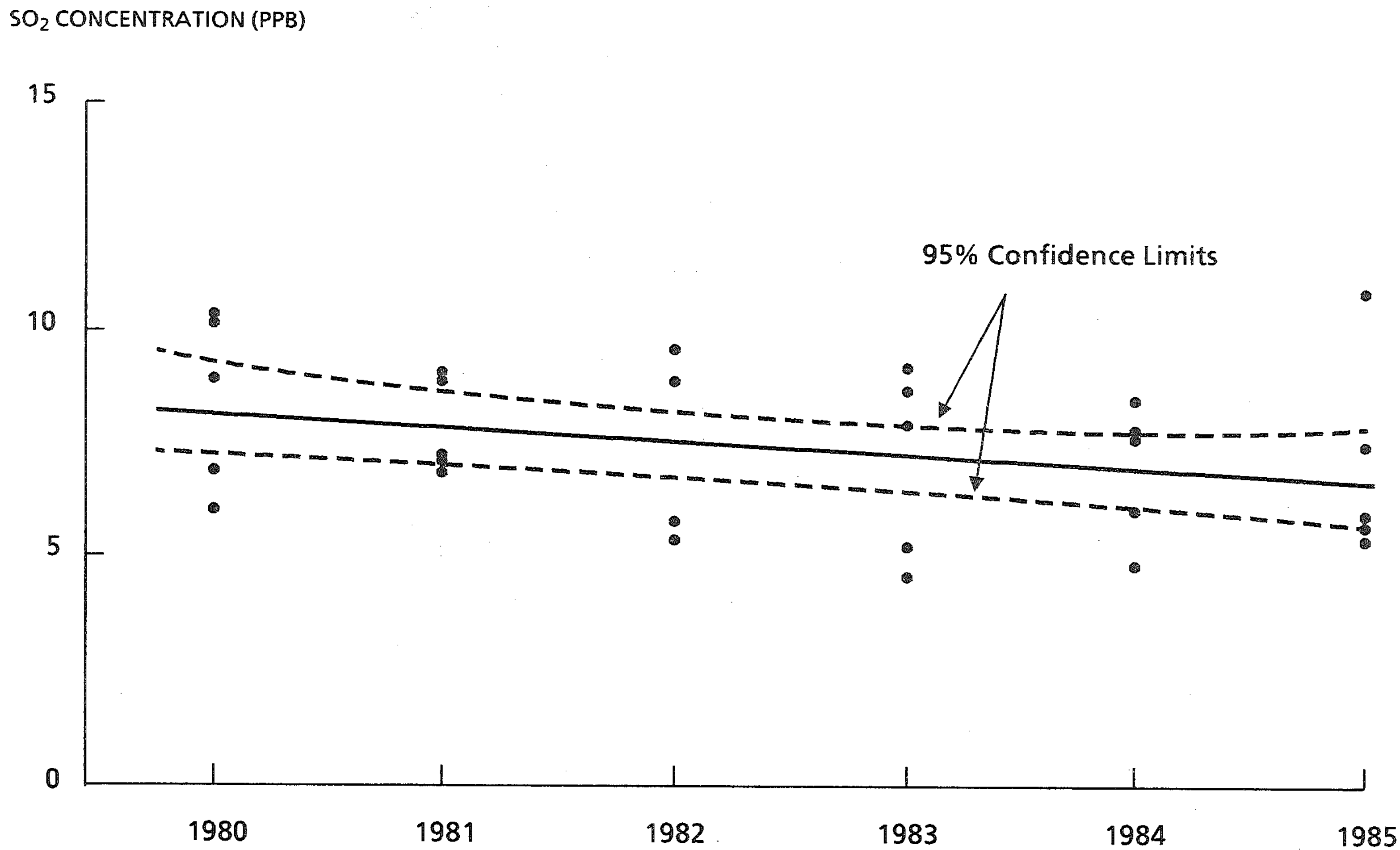
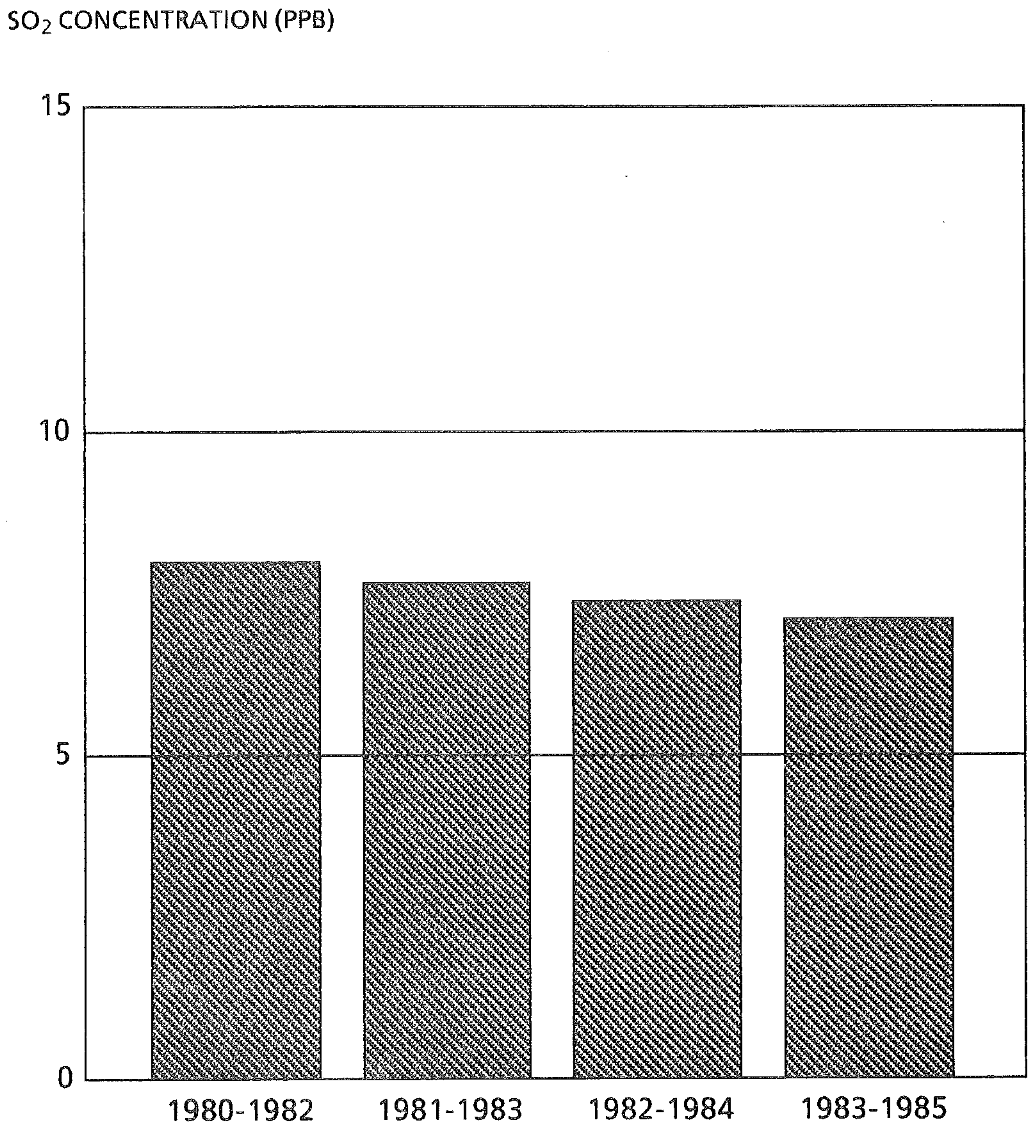


FIGURE 2D

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



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 1985 consisted of:

40	Total suspended particulate hi-vol sites
2	Total suspended particulate lo-vol sites
15	Lead hi-vol sites
7	Lead lo-vol sites
19	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 1985 is available from the Department of Environmental Protection, Air Compliance Unit, Monitoring Section, State Office Building, Hartford, Connecticut, 06106.

D. POLLUTANT STANDARDS INDEX

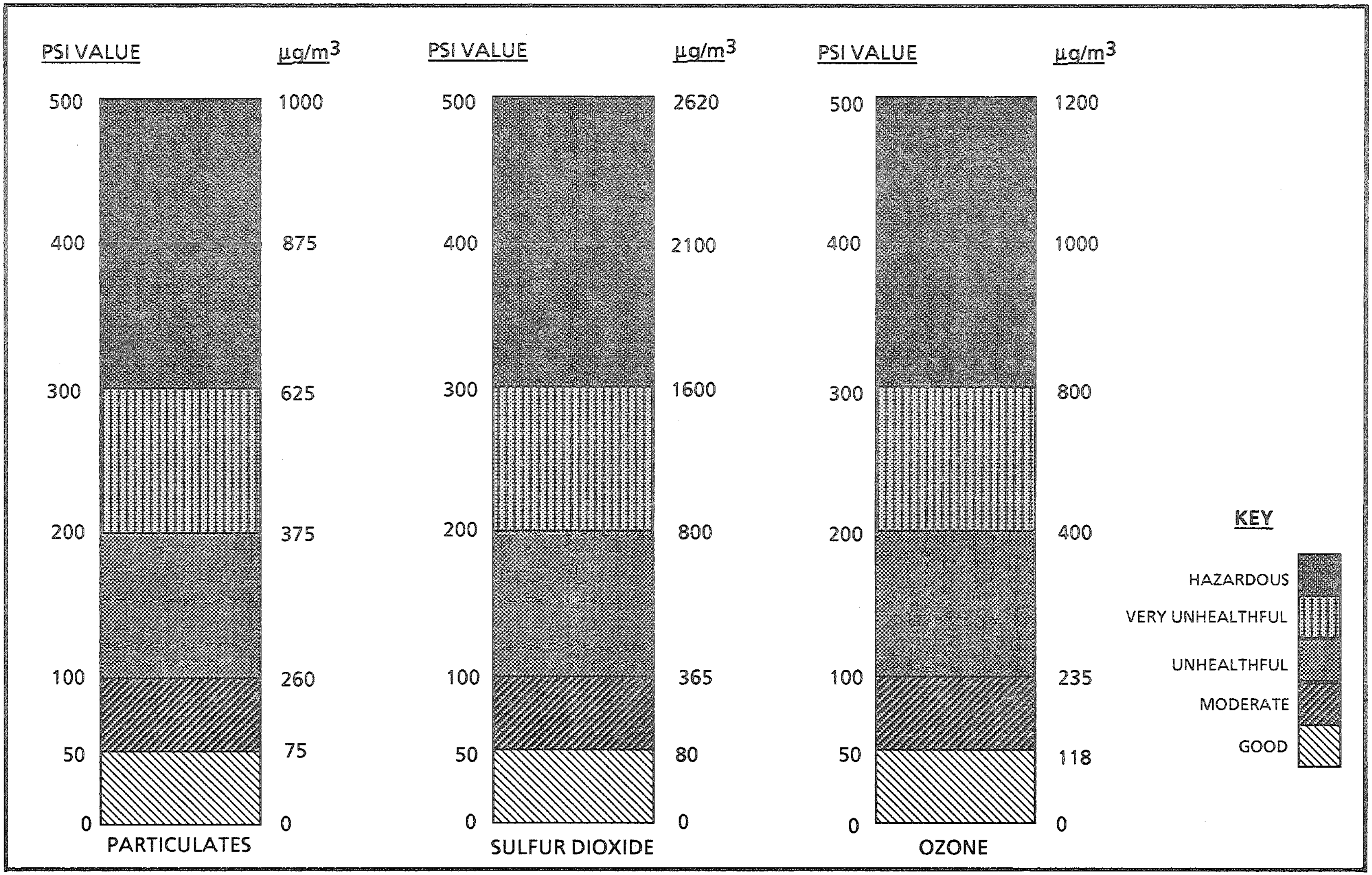
The Pollutant Standards Index (PSI) is a daily air quality index recommended for common use in state and local agencies by the U.S. Environmental Protection Agency. Starting on November 15, 1976, Connecticut began reporting the PSI on a 7-day basis, but is currently reporting the PSI on a 5-day basis. 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 1985, Connecticut reported the total suspended particulate PSI for the towns of Ansonia, Bridgeport, Danbury, Greenwich, Groton, Hartford, Milford, New Britain, New Haven, Norwalk, Norwich, Stamford, Stratford, Wallingford, and Waterbury; and reported the sulfur dioxide PSI for the towns of Bridgeport, Danbury, East Haven, Greenwich, Groton, Hartford, Milford, New Britain, New Haven, Norwalk, Preston, 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 and Lead)

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 (.08 to .10 PPM) a minimum of once every two weeks. 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 1985. No site had a measured value exceeding the primary 24-hour standard of 260 $\mu g/m^3$, but the secondary 24-hour standard of 150 $\mu g/m^3$ was exceeded at both the Norwich-002 and the Stamford-001 monitoring sites in 1985. In order for the secondary standard to be violated, the second highest TSP level at a site must exceed 150 $\mu g/m^3$. No site violated the standard in 1985, which was also the case in 1984.

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 most sites and every third day at certain urban stations.

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 µg/m3. In the third analysis, total sulfates are determined by means of the same procedure used in the second analysis, but each of several samples collected in the quarter-year is analyzed individually and the results from all the samples are averaged. 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 1985, 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 166 precision checks, the 95% probability limits for precision ranged from -11% to +9%. Accuracy is based on air flow through the monitor. The 95% probability limits for accuracy, based on 78 audits conducted on the hi-vol monitoring system network, ranged from -6% 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. Of the thirty-six (36) sites that had valid annual geometric means (as determined by EPA minimum sampling criteria) in both 1984 and 1985, ten (10) sites had lower annual geometric means when compared to 1984. Of the twenty-five (25) sites whose annual geometric means increased, the highest increase was 11.4 µg/m3 at the Stamford-001 site (see Table 5).

Historical Data - A summary of annual average TSP data for 1983-1985 is presented in Table 5. For data going back to 1957, see the 1980 and 1982 versions 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 μg/m³ was exceeded, as demonstrated by actual measurements at the site.

The statistical projections in Table 5 indicate that more frequent TSP sampling in 1985 might have resulted in measured violations (i.e., two or more exceedances) of the secondary 24-hour standard at Bridgeport-123, Naugatuck-001, Stamford-001 and Waterbury-007. Statistical projections regarding the primary 24-hour standard of 260 μg/m³ 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), in Hartford at site 003 in 1985, 58 samples were analyzed and a geometric mean of 50.8 μg/m³ 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 μg/m³, 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 μg/m³, 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 μg/m³, 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 μg/m³, 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 1985 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 was achieved at all the sites. With regard to the secondary annual standard, the table also shows that the DEP is confident about compliance at 38 sites and uncertain about compliance at 2 sites: Bridgeport-123 and Stamford-001.

24-Hour Averages - Table 7 presents the 1st and 2nd 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 1985, which was also the case in 1984. The 2nd high 24-hour average increased at 16 of the 36 sites which met the minimum EPA sampling criteria in both 1984 and 1985. Five (5) of these increases were greater than or equal to 20 μg/m³. The 2nd high 24-hour average decreased at 19 of the sites, and 6 of these decreases were greater than or equal to 15 μg/m³.

Table 8 summarizes the statistical predictions from Table 5 regarding the number of days exceeding the 24-hour standards. This table shows that, if sampling had been conducted every day in 1985, there would have been no site with a violation of the primary 24-hour standard and four (4) sites with violations of the secondary 24-hour standard. This was also the case in 1984.

Hi-vol Averages - Quarterly and annual averages of fourteen components or characteristics of the particulate matter collected at each hi-vol sampling location have been computed for the year 1985 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 30-day periods, 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 or every third 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 1985 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 1985. 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 47% of the high TSP days occur with winds out of the southwest quadrant and most of those days have 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.

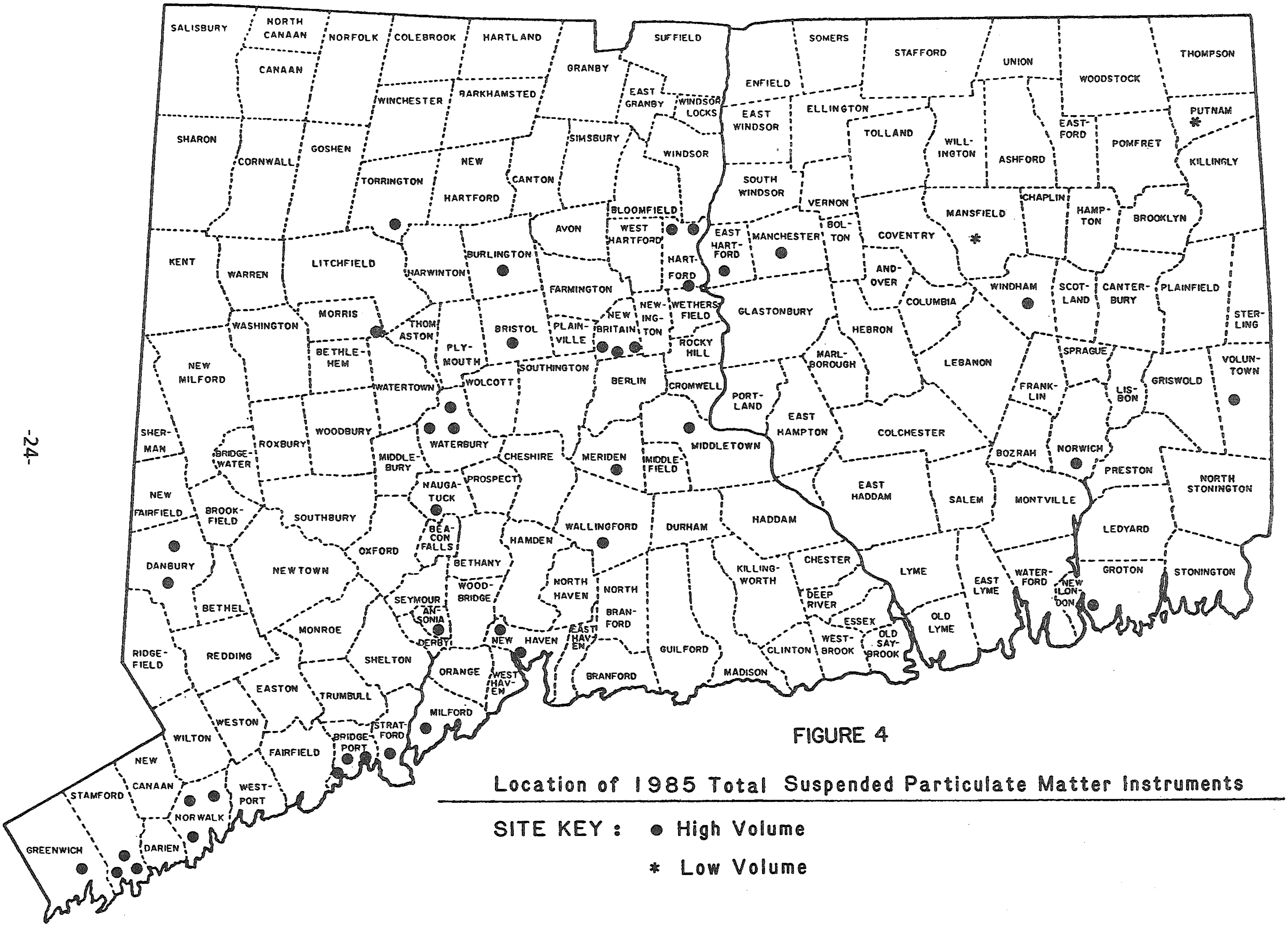


FIGURE 4

Location of 1985 Total Suspended Particulate Matter Instruments

SITE KEY : ● High Volume

* Low Volume

TABLE 5

1983-1985 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
ANSONIA	003	1983	60	42.2	38	47	1.540	1	
ANSONIA	003	1984	60	42.7	39	47	1.503		
ANSONIA	004	1985	59	39.4	35	44	1.612	1	
BRIDGEPORT	001	1983	60	41.0	37	46	1.594	1	
BRIDGEPORT	001	1984	58	42.8	39	47	1.422		
BRIDGEPORT	001	1985	59	43.0	39	47	1.479		
BRIDGEPORT	009	1983	57	39.1	35	43	1.539		
BRIDGEPORT	009	1984	58	41.6	37	46	1.556	1	
BRIDGEPORT	009	1985	57	39.7	35	45	1.615	1	
BRIDGEPORT	123	1983	59	54.1	49	60	1.530	3	
BRIDGEPORT	123	1984	57	52.6	48	58	1.514	2	
BRIDGEPORT	123	1985	57	59.6	53	67	1.586	8	
BRISTOL	001	1983	58	32.2	29	36	1.528		
BRISTOL	001	1984	56	34.5	31	39	1.554		
BRISTOL	001	1985	60	36.4	33	40	1.487		
BURLINGTON	001	1983	58	20.3	18	23	1.797		
BURLINGTON	001	1984	58	20.6	18	24	1.778		
BURLINGTON	001	1985	59	20.1	18	22	1.589		
DANBURY	002	1983	56	44.6	40	49	1.509	1	
DANBURY	002	1984	57	43.8	39	49	1.537	1	
DANBURY	002	1985	61	44.3	41	48	1.445		
DANBURY	123	1983	53	43.1	38	48	1.590	1	
DANBURY	123	1984	57	42.8	38	48	1.624	2	
DANBURY	123	1985	58	43.3	39	48	1.552	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

1983-1985 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
EAST HARTFORD	004	1983	60	38.8	35	43	1.504		
EAST HARTFORD	004	1984	57	41.2	37	46	1.507		
EAST HARTFORD	004	1985	57	41.9	38	46	1.522		
GREENWICH	008	1983	46*	36.4	33	40	1.466		
GREENWICH	008	1984	61	40.9	37	45	1.450		
GREENWICH	008	1985	60	43.8	39	49	1.576	1	
GROTON	006	1983	59	35.8	33	39	1.433		
GROTON	006	1984	56	37.3	33	42	1.659	1	
GROTON	006	1985	59	34.1	31	38	1.533		
HADDAM	002	1983	28*	24.7	22	28	1.440		
HADDAM	002	1984	60	27.9	25	31	1.554		
HARTFORD	003	1983	57	46.3	42	51	1.513	1	
HARTFORD	003	1984	60	48.3	44	53	1.509	1	
HARTFORD	003	1985	58	50.8	46	55	1.442		
HARTFORD	013	1983	60	42.8	38	48	1.580	1	
HARTFORD	013	1984	57	44.2	40	49	1.539	1	
HARTFORD	013	1985	46*	42.5	38	48	1.531		
HARTFORD	014	1983	57	40.3	36	45	1.512		
HARTFORD	014	1984	60	41.7	38	46	1.519		
HARTFORD	014	1985	58	43.7	40	48	1.453		
MANCHESTER	001	1983	59	33.7	31	37	1.481		
MANCHESTER	001	1984	60	31.4	28	35	1.552		
MANCHESTER	001	1985	55	35.1	31	39	1.565		
MERIDEN	002	1983	55	40.6	36	45	1.552		
MERIDEN	002	1984	60	42.4	38	47	1.510		
MERIDEN	002	1985	59	44.9	41	50	1.519	1	
MERIDEN	008	1983	59	37.2	34	41	1.532		

* 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

1983-1985 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
MIDDLETOWN	003	1983	57	38.2	35	42	1.484		
MIDDLETOWN	003	1984	55	38.8	35	43	1.509		
MIDDLETOWN	003	1985	57	41.7	38	46	1.481		
MILFORD	002	1983	58	40.9	38	44	1.405		
MILFORD	002	1984	61	40.8	37	45	1.460		
MILFORD	002	1985	60	44.9	41	49	1.472		
MORRIS	001	1984	15*	27.0	22	33	1.483		
MORRIS	001	1985	60	25.6	23	29	1.586		
NAUGATUCK	001	1983	59	40.2	36	44	1.506		
NAUGATUCK	001	1984	59	41.4	37	46	1.562	1	
NAUGATUCK	001	1985	60	45.2	41	50	1.574	2	
NEW BRITAIN	007	1983	59	35.8	32	40	1.590		
NEW BRITAIN	007	1984	59	36.7	33	40	1.506		
NEW BRITAIN	007	1985	59	37.8	35	41	1.456		
NEW BRITAIN	008	1983	58	35.8	32	40	1.569		
NEW BRITAIN	008	1984	61	37.1	33	41	1.561		
NEW BRITAIN	008	1985	59	37.2	34	41	1.525		
NEW BRITAIN	009	1983	59	36.6	33	41	1.537		
NEW BRITAIN	009	1984	60	36.0	32	40	1.555		
NEW BRITAIN	009	1985	56	34.5	31	38	1.517		
NEW HAVEN	002	1983	52	48.8	44	54	1.521	1	
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	013	1983	58	43.8	40	48	1.438		
NEW HAVEN	013	1984	59	45.3	42	49	1.421		
NEW HAVEN	013	1985	55	44.1	40	48	1.451		

* 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

1983-1985 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	DISTRIBUTION--LOGNORMAL MEASURED DAYS OVER 150 UG/M3
NORWALK	001	1983	58	40.0	36	44	1.491		
NORWALK	001	1984	57	41.8	38	46	1.506		
NORWALK	001	1985	50	41.5	37	46	1.527		
NORWALK	005	1983	58	45.3	41	50	1.506	1	
NORWALK	005	1984	57	45.6	42	50	1.475		
NORWALK	005	1985	57	46.4	42	51	1.502	1	
NORWALK	012	1983	60	41.1	37	45	1.542		
NORWALK	012	1984	60	40.9	37	45	1.500		
NORWALK	012	1985	59	41.1	37	45	1.466		
NORWICH	001	1983	59	39.6	36	43	1.462		
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
STAMFORD	001	1983	59	45.4	41	51	1.573	2	
STAMFORD	001	1984	58	45.4	41	51	1.600	2	
STAMFORD	001	1985	56	56.8	51	63	1.557	5	1
STAMFORD	007	1983	59	44.7	41	49	1.462		
STAMFORD	007	1984	59	44.8	41	49	1.423		
STAMFORD	007	1985	58	47.1	43	51	1.435		
STAMFORD	021	1983	59	45.3	41	50	1.468		
STAMFORD	021	1984	57	49.4	45	54	1.457		
STAMFORD	021	1985	53	44.8	41	49	1.411		
STRATFORD	005	1983	58	44.4	41	48	1.435		
STRATFORD	005	1984	60	44.1	40	49	1.502		
STRATFORD	005	1985	58	44.2	40	49	1.566	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

1983-1985 TSP ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

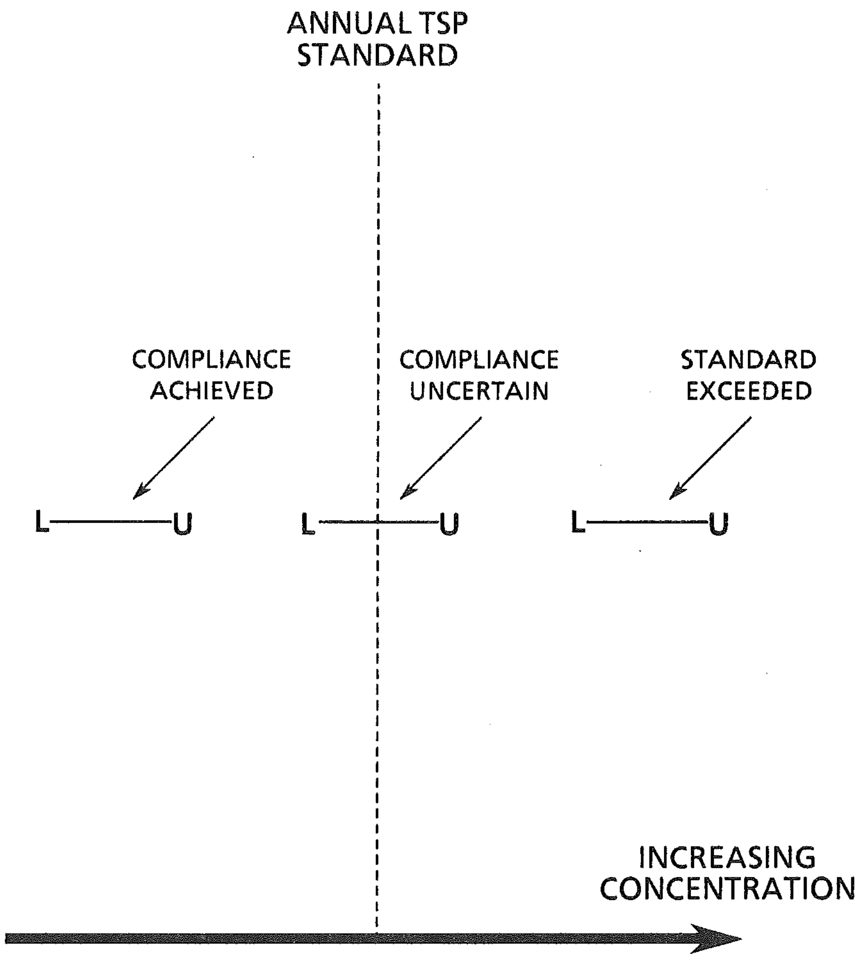
TOWN NAME	SITE	YEAR	SAMPLES	GEOM MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	GEOM STD DEV	DISTRIBUTION--LOGNORMAL PREDICTED DAYS OVER 150 UG/M3	MEASURED DAYS OVER 150 UG/M3
TORRINGTON	001	1983	56	36.8	33	41	1.526		
TORRINGTON	001	1984	61	38.0	34	43	1.637	1	
TORRINGTON	001	1985	60	37.6	34	42	1.613	1	
VOLUNTOWN	001	1983	59	23.7	21	27	1.624		
VOLUNTOWN	001	1984	59	23.2	21	26	1.618		
VOLUNTOWN	001	1985	56	23.3	21	26	1.495		
WALLINGFORD	001	1983	57	40.4	37	45	1.512		
WALLINGFORD	001	1984	60	43.1	39	48	1.556	1	
WALLINGFORD	001	1985	59	43.1	39	48	1.597	1	
WATERBURY	005	1983	58	38.5	35	42	1.488		
WATERBURY	005	1984	57	41.4	37	46	1.541		
WATERBURY	005	1985	56	42.8	38	48	1.567	1	
WATERBURY	006	1983	60	34.2	31	38	1.523		
WATERBURY	006	1984	59	37.1	33	41	1.558		
WATERBURY	006	1985	59	35.7	32	39	1.502		
WATERBURY	007	1983	60	47.4	43	52	1.472		
WATERBURY	007	1984	59	47.5	43	53	1.545	2	
WATERBURY	007	1985	60	50.6	45	56	1.581	3	
WATERFORD	001	1983	55	25.6	23	29	1.646		
WATERFORD	001	1984	58	29.3	26	33	1.693		
WILLIMANTIC	002	1983	60	35.2	32	39	1.505		
WILLIMANTIC	002	1984	61	37.6	34	41	1.491		
WILLIMANTIC	002	1985	60	37.3	34	41	1.559		

* 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 1985

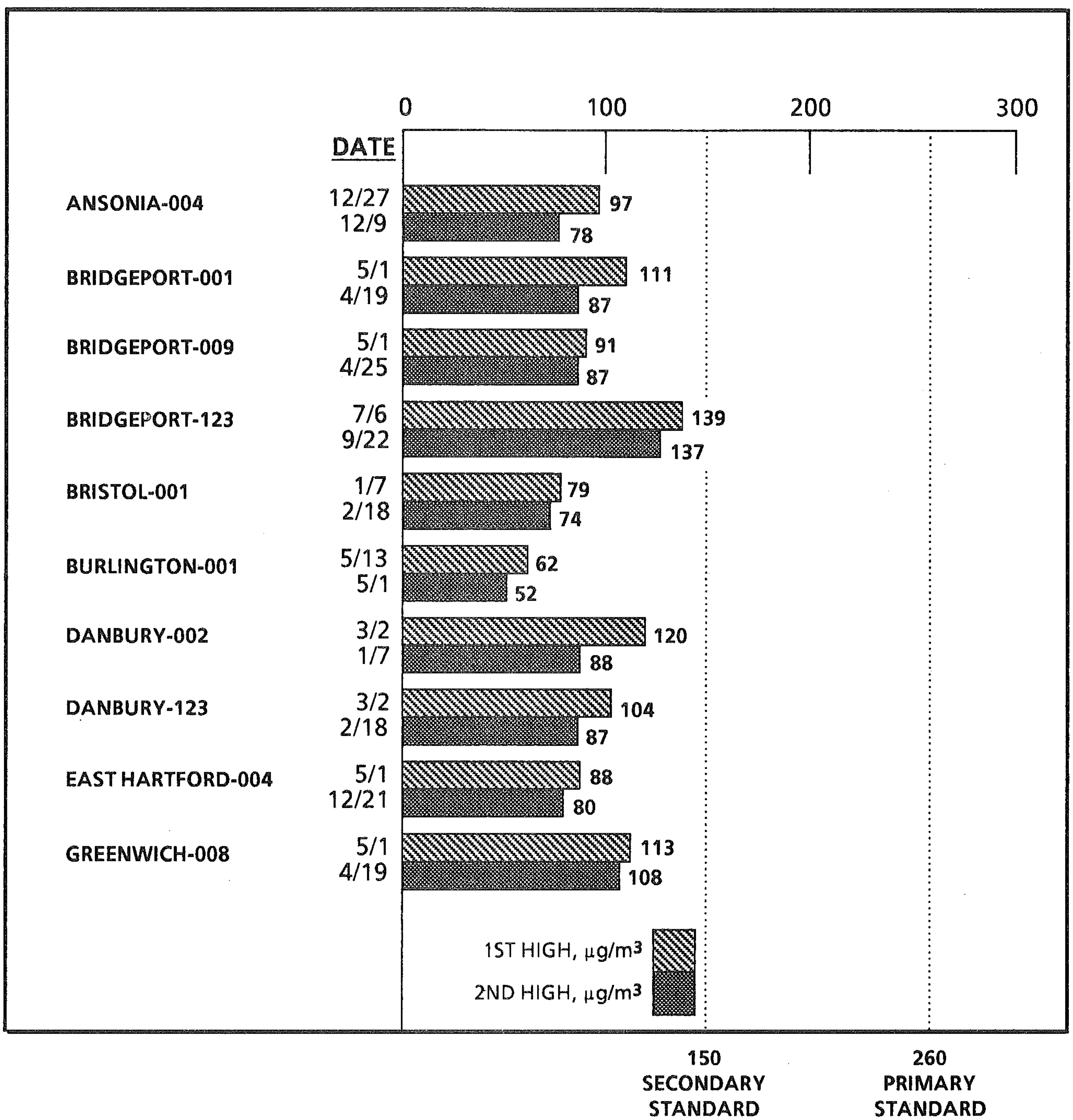
(95% CONFIDENCE INTERVAL)

	EXCEEDED	UNCERTAIN	ACHIEVED
PRIMARY STANDARD (75 µg/m^3)	NO SITES	NO SITES	40 SITES
SECONDARY STANDARD (60 µg/m^3)	NO SITES	2 SITES*	38 SITES*

* The upper 95% confidence limit exceeds the secondary annual standard at the Bridgeport-123 site and the Stamford-001 site.

TABLE 7

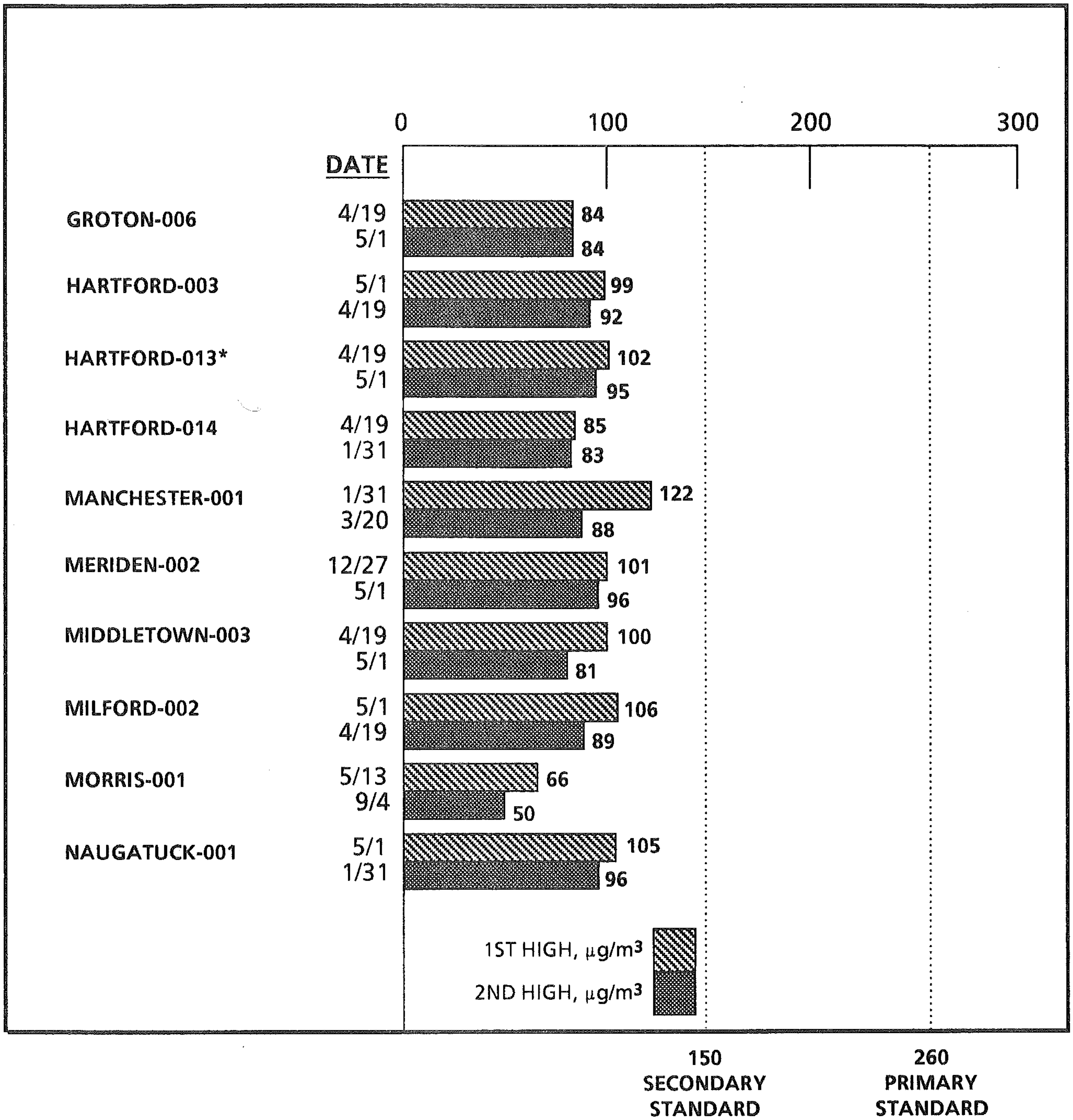
1985 MAXIMUM 24-HOUR TSP CONCENTRATIONS



* 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.

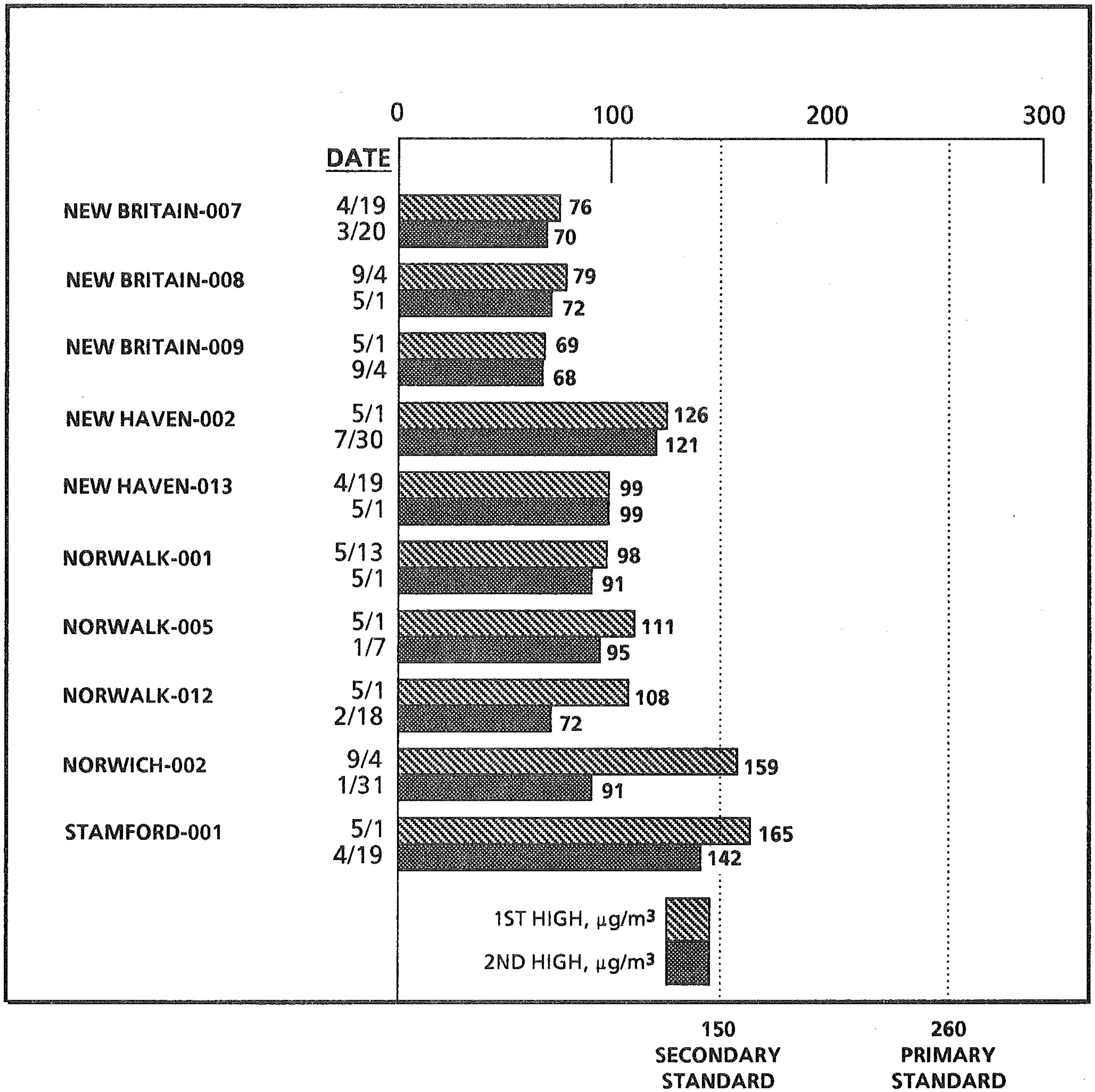
TABLE 7, CONTINUED



* 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.

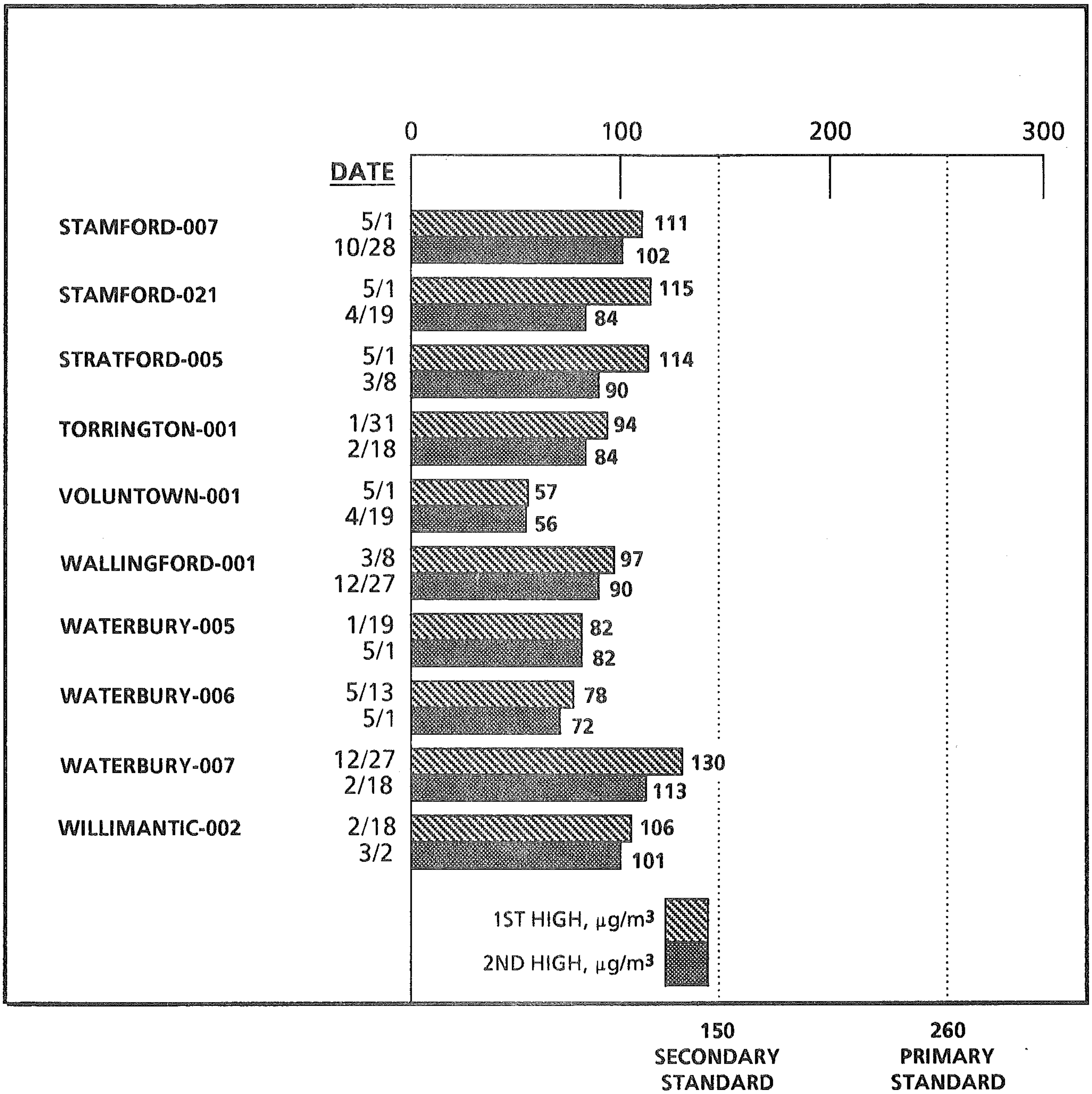
TABLE 7, CONTINUED



* 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.

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.

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
1971	44	37	84%	19	43%
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%

[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 1985 HI-VOL TSP

TOWN	AREA	SITE
ANSONIA	~~0060~~ 0008	004

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	19.1	7.6	15.3	41.2	20.7
CHROMIUM	4	1	4	2	3
COPPER	160	100	140	50	110
IRON	730	460	560	600	580
LEAD	290	130	110	100	160
MANGANESE	12	13	11	12	12
NICKEL	20	9	8	10	12
VANADIUM	60	20	20	20	30
ZINC	790	270	420	310	440
WATER SOLUBLES (ng/m3)					
NITRATE	3730	4460	2930	2540	3440
SULFATE	7700	10020	8210	7220	8330
AMMONIUM	340	90	50	330	200
TSP (μg/m3)	50	47	40	39	44
SAMPLE COUNT	14	16	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
BRIDGEPORT	0060	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	3.4	4.0	1.4	2.6	2.9
CHROMIUM	4	4	3	2	3
COPPER	70	140	150	40	100
IRON	620	670	600	570	620
LEAD	340	220	160	120	210
MANGANESE	16	19	13	19	17
NICKEL	20	15	9	8	13
VANADIUM	60	30	20	20	30
ZINC	110	80	40	50	70
WATER SOLUBLES (ng/m^3)					
NITRATE	6350	5130	2910	2940	4310
SULFATE	8220	9760	9220	7770	8770
AMMONIUM	220	80	90	200	150
TSP (µg/m^3)	50	53	42	40	46
SAMPLE COUNT	14	16	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
BRIDGEPORT	0060	009

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	4.0	4.8	1.6	1.7	3.0
CHROMIUM	3	3	4	2	3
COPPER	150	140	180	170	160
IRON	550	610	550	350	510
LEAD	320	190	120	80	180
MANGANESE	18	16	10	11	14
NICKEL	25	14	9	9	14
VANADIUM	80	30	20	20	40
ZINC	140	80	40	40	70
WATER SOLUBLES (ng/m^3)					
NITRATE	5870	5810	3940	2560	4510
SULFATE		9870	10050	7490	
AMMONIUM	420	130	250	230	260
TSP ($\mu g/m^3$)	49	53	45	31	44
SAMPLE COUNT	14[a]	14[b]	14	15	

[a] For sulfate, the sample count is 0 in the first quarter.
[b] For sulfate, the sample count is 9 in the second quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	2.4	6.1	1.5	1.5	2.8
CHROMIUM	4	8	8	2	5
COPPER	90	120	140	80	110
IRON	950	1840	1280	660	1170
LEAD	350	270	170	120	230
MANGANESE	24	62	21	15	30
NICKEL	25	19	16	11	18
VANADIUM	80	30	30	20	40
ZINC	150	100	60	60	90
WATER SOLUBLES (ng/m^3)					
NITRATE	5210	5730	3610	2770	4320
SULFATE	9630	10340	9870	7480	9300
AMMONIUM	200	170	420	290	270
TSP ($\mu g/m^3$)	68	93	73	45	69
SAMPLE COUNT	15	14	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
BRISTOL	0070	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.1	1.5	1.3	0.8	1.2
CHROMIUM	3	.25 <1	4	2	2[a]
COPPER	160	150	140	30	120
IRON	690	390	420	830	580
LEAD	230	130	90	80	130
MANGANESE	14	11	11	11	12
NICKEL	8	3	4	11	6
VANADIUM	30	30	10	50	30
ZINC	70	40	20	40	40
WATER SOLUBLES (ng/m3)					
NITRATE	5790	3960	1880	2680	3610
SULFATE	7460	9550	9220	7380	8410
AMMONIUM	120	100	120	250	150
TSP (μg/m3)	48	40	36	32	39
SAMPLE COUNT	15	16	14	15	

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

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	0.9	0.7	2.0	0.8	1.1
CHROMIUM	1	<1	1	1	1[a]
COPPER	80	80	90	60	80
IRON	180	160	200	120	170
LEAD	80	70	30	30	50
MANGANESE	4	7	4	5	5
NICKEL	3	2	2	3	2
VANADIUM	10	10	<10	10	10[b]
ZINC	70	30	<10	20	30[c]
WATER SOLUBLES (ng/m³)					
NITRATE	3030	2470	1060	1540	2060
SULFATE	6030	7690	6930	5760	6630
AMMONIUM	60	10	40	<10	30[d]
TSP (µg/m³)	22	29	23	21	24
SAMPLE COUNT	15	16	14	14	

[a] The average was calculated using one quarter of the reportable limit in the second quarter.
[b,c] The average was calculated using one quarter of the reportable limit in the third quarter.
[d] The average was calculated using one quarter of the reportable limit in the fourth quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.1	1.1	1.6	1.0	1.2
CHROMIUM	1	1	2	3	2
COPPER	30	50	90	50	50
IRON	880	570	770	620	710
LEAD	240	140	110	90	140
MANGANESE	16	13	12	16	14
NICKEL	11	4	20	8	11
VANADIUM	30	<10	10	10	10[a]
ZINC	70	40	20	40	40
WATER SOLUBLES (ng/m^3)					
NITRATE	4300	4120	2390	2290	3290
SULFATE	7730	9330	9730	7380	8560
AMMONIUM	190	70	80	220	140
TSP ($\mu g/m^3$)	59	46	46	40	48
SAMPLE COUNT	15	16	15	15	

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

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
DANBURY	0175	123

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	1.1	1.7	1.1	1.3
CHROMIUM	2	1	3	2	2
COPPER	130	130	80	50	100
IRON	900	640	570	620	690
LEAD	250	130	110	80	140
MANGANESE	17	15	9	12	13
NICKEL	9	4	6	7	7
VANADIUM	30	10	10	10	20
ZINC	80	40	20	30	40
WATER SOLUBLES (ng/m^3)					
NITRATE	4070	3880	2170	2170	3100
SULFATE	7420	9790	8330	6790	8070
AMMONIUM	200	60	50	140	110
TSP ($\mu g/m^3$)	62	49	40	39	48
SAMPLE COUNT	15	15	13	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	2.3	3.4	1.7	1.1	2.2
CHROMIUM	3	1	3	4	3
COPPER	60	70	90	50	70
IRON	760	590	660	870	720
LEAD	330	210	190	120	210
MANGANESE	13	14	12	14	13
NICKEL	11	5	6	12	8
VANADIUM	30	10	10	20	20
ZINC	80	40	10	60	50
WATER SOLUBLES (ng/m3)					
NITRATE	4310	3500	2420	2510	3230
SULFATE	8010	9480	9130	6800	8370
AMMONIUM	210	100	70	200	150
TSP (μg/m3)	53	48	44	60	51
SAMPLE COUNT	15	16	13	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.6	1.8	2.5	1.1	1.8
CHROMIUM	3	1	2	2	2
COPPER	120	230	200	90	160
IRON	840	800	700	580	730
LEAD	240	160	110	90	150
MANGANESE	12	16	12	11	13
NICKEL	11	6	7	9	8
VANADIUM	20	10	10	10	10
ZINC	70	50	20	50	50
WATER SOLUBLES (ng/m^3)					
NITRATE	3920	4450	2550	2800	3460
SULFATE	6860	9250	10620	7930	8690
AMMONIUM	250	40	160	160	150
TSP ($\mu g/m^3$)	49	55	47	41	48
SAMPLE COUNT	15	16	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	0.9	0.7	0.5	0.9	0.8
CHROMIUM	3	3	5	2	3
COPPER	70	120	120	40	90
IRON	440	570	390	580	500
LEAD	120	80	60	50	80
MANGANESE	10	12	7	10	10
NICKEL	23	24	10	21	20
VANADIUM	60	60	20	40	50
ZINC	60	60	<10	50	40[a]
WATER SOLUBLES (ng/m³)					
NITRATE	3850	3550	3000	2750	3300
SULFATE	7600	9200	7310	7700	8000
AMMONIUM	160	40	20	260	120
TSP (μg/m³)	39	41	33	35	37
SAMPLE COUNT	15	16	13	15	

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

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.7	1.4	1.3	1.5	1.5
CHROMIUM	3	1	3	3	2
COPPER	140	140	120	90	120
IRON	730	690	790	780	750
LEAD	410	200	130	110	220
MANGANESE	14	16	14	15	15
NICKEL	16	5	6	10	9
VANADIUM	50	10	10	30	30
ZINC	210	30	20	50	80
WATER SOLUBLES (ng/m3)					
NITRATE	4240	3460	320	2850	3450
SULFATE		8180	10370	7510	
AMMONIUM	180	70	240	280	190
TSP (µg/m3)	60	54	53	49	54
SAMPLE COUNT	15[a]	15[b]	13	15	

[a] For sulfate, the sample count is 0 in the first quarter.
[b] For sulfate, the sample count is 10 in the second quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
HARTFORD	0420	013

	QUARTERLY AVG 1ST	2ND	3RD	4TH	ANNUAL AVG
METALS (ng/m³)					
BERYLLIUM	<.1	<.1		<.1	
CADMIUM	1.3	4.9		8.7	
CHROMIUM	6	5		5	
COPPER	60	100		80	
IRON	750	790		680	
LEAD	240	320		120	
MANGANESE	13	19		13	
NICKEL	13	6		9	
VANADIUM	30	10		20	
ZINC	70	50		60	
WATER SOLUBLES (ng/m³)					
NITRATE	4430	3620		2910	
SULFATE	8230	8990	19440	7040	
AMMONIUM	230	70		190	
TSP (µg/m³)	46	53		39	
SAMPLE COUNT	15	16	0[a]	14	

[a] For sulfate, the sample count is 1 in the third quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
HARTFORD	0420	014

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.7	1.2	0.9	1.0	1.2
CHROMIUM	3	1	3	2	2
COPPER	100	120	110	60	100
IRON	640	530	710	570	610
LEAD	290	170	130	120	180
MANGANESE	13	13	12	12	13
NICKEL	14	4	4	7	7
VANADIUM	50	10	10	20	20
ZINC	80	50	60	50	60
WATER SOLUBLES (ng/m3)					
NITRATE	4460	3830	2770	2800	3480
SULFATE	7890	9270	9500	7240	8500
AMMONIUM	210	80	110	240	160
TSP (µg/m3)	53	47	46	40	47
SAMPLE COUNT	14	16	14	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.3	1.5	2.7	0.5	1.5
CHROMIUM	<1	1	1	1	1[a]
COPPER	70	90	90	50	80
IRON	560	320	320	160	340
LEAD	130	100	50	30	80
MANGANESE	9	10	6	5	8
NICKEL	4	1	3	4	3
VANADIUM	10	<10	<10	10	10[b]
ZINC	40	20	<10	20	20[c]
WATER SOLUBLES (ng/m3)					
NITRATE	2830	2350	720	1600	1900
SULFATE	6140	7940	8200	6120	7090
AMMONIUM	90	50	30	70	60
TSP (µg/m3)	29	34	30	20	28
SAMPLE COUNT	15	16	14	15	

[a] The average was calculated using one quarter of the reportable limit in the 1st quarter.
[b] The average was calculated using one quarter of the reportable limit in the 2nd and 3rd quarters.
[c] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.2	1.4	1.3	0.6	1.1
CHROMIUM	2	1	4	1	2
COPPER	90	80	90	50	80
IRON	470	410	330	350	390
LEAD	160	130	80	70	110
MANGANESE	12	12	7	9	10
NICKEL	8	3	5	5	5
VANADIUM	20	10	<10	10	10[a]
ZINC	70	30	<10	30	40[b]
WATER SOLUBLES (ng/m^3)					
NITRATE	3920	2830	2190	2350	2870
SULFATE	6800	8680	9630	6890	7870
AMMONIUM	160	110	160	150	140
TSP ($\mu g/m^3$)	45	45	36	30	39
SAMPLE COUNT	15	14	11	15	

[a,b] The average was calculated using one quarter of the reportable limit in the third quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
MERIDEN	0540	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.5	1.2	2.2	2.9	1.9
CHROMIUM	2	2	2	2	2
COPPER	160	220	240	140	190
IRON	980	580	610	490	670
LEAD	280	140	120	110	160
MANGANESE	16	14	11	11	13
NICKEL	12	7	5	10	9
VANADIUM	50	10	10	20	20
ZINC	190	120	150	110	140
WATER SOLUBLES (ng/m^3)					
NITRATE	4440	3640	2820	2410	3350
SULFATE	7890	10170	8850	7330	8580
AMMONIUM	340	110	110	320	220
TSP ($\mu g/m^3$)	62	49	44	39	49
SAMPLE COUNT	15	16	13	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
MIDDLETOWN	0570	003

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.1	1.3	0.9	1.0	1.1
CHROMIUM	2	1	2	2	2
COPPER	90	110	70	60	80
IRON	790	550	500	450	580
LEAD	260	330	120	100	200
MANGANESE	16	15	9	20	15
NICKEL	10	5	4	8	7
VANADIUM	30	10	<10	20	20[a]
ZINC	100	70	10	50	60
WATER SOLUBLES (ng/m^3)					
NITRATE	4070	4170	2670	2620	3390
SULFATE	8240	10020	8660	7130	8510
AMMONIUM	190	100	110	260	170
TSP (µg/m^3)	53	51	40	39	46
SAMPLE COUNT	15	14	14	14	

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

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
MILFORD	0590	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.7	2.0	1.0	1.4	1.8
CHROMIUM	2	2	3	3	3
COPPER	30	60	70	50	50
IRON	540	590	800	590	630
LEAD	250	200	110	110	170
MANGANESE	13	14	10	10	12
NICKEL	19	18	12	30	20
VANADIUM	50	40	30	90	50
ZINC	100	40	30	60	60
WATER SOLUBLES (ng/m^3)					
NITRATE	4560	4520	3110	2440	3660
SULFATE	8860	10290	10340	9150	9660
AMMONIUM	330	130	210	260	230
TSP ($\mu g/m^3$)	51	54	46	42	48
SAMPLE COUNT	15	15	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NAUGATUCK	0660	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	3.3	2.1	2.9	2.2	2.6
CHROMIUM	3	2	4	3	3
COPPER	100	100	220	40	110
IRON	780	620	910	690	750
LEAD	300	190	180	170	210
MANGANESE	19	19	23	15	19
NICKEL	9	4	5	7	6
VANADIUM	30	10	10	10	20
ZINC	130	90	80	90	100
WATER SOLUBLES (ng/m3)					
NITRATE	4290	4450	2490	2370	3430
SULFATE	9590	10070	10350	8260	9560
AMMONIUM	350	110	60	270	200
TSP (µg/m3)	54	52	51	42	50
SAMPLE COUNT	15	16	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.1	1.1	0.7	1.0	1.0
CHROMIUM	2	1	2	2	2
COPPER	40	60	60	40	50
IRON	520	520	510	420	500
LEAD	190	130	100	80	130
MANGANESE	10	12	10	11	11
NICKEL	10	7	5	7	7
VANADIUM	30	10	10	20	20
ZINC	60	50	10	30	40
WATER SOLUBLES (ng/m^3)					
NITRATE	4200	3880	2740	2540	3380
SULFATE	7900	9610	9130	7100	8500
AMMONIUM	340	60	100	240	180
TSP ($\mu g/m^3$)	45	43	38	35	40
SAMPLE COUNT	15	16	15	13	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NEW BRITAIN	0680	008

	QUARTERLY AVG 1ST	2ND	3RD	4TH	ANNUAL AVG
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.1	1.3	0.8	0.7	1.0
CHROMIUM	2	1	2	2	2
COPPER	210	160	180	120	170
IRON	510	500	650	440	530
LEAD	210	140	110	100	140
MANGANESE	9	12	10	10	10
NICKEL	8	6	5	6	6
VANADIUM	30	10	10	10	10
ZINC	70	40	20	30	40
WATER SOLUBLES (ng/m3)					
NITRATE	3760	4000	2050	2540	3100
SULFATE	6630	9270	9430	6740	8090
AMMONIUM	220	130	110	220	170
TSP (µg/m3)	42	43	42	34	40
SAMPLE COUNT	14	16	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NEW BRITAIN	0680	009

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.0	1.0	0.8	1.7	1.1
CHROMIUM	1	1	2	2	1
COPPER	50	110	160	90	100
IRON	380	370	600	390	430
LEAD	150	100	100	70	110
MANGANESE	9	11	10	9	10
NICKEL	7	3	4	6	5
VANADIUM	30	10	10	20	20
ZINC	50	40	30	40	40
WATER SOLUBLES (ng/m^3)					
NITRATE	3520	3500	2270	2500	2970
SULFATE	6930	8600	8600	6500	7670
AMMONIUM	360	140	180	310	250
TSP (μg/m^3)	37	41	39	32	37
SAMPLE COUNT	15	14	14	13	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NEW HAVEN	0700	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.4	2.0	0.9	1.6	1.5
CHROMIUM	2	2	3	3	2
COPPER	250	370	340	110	270
IRON	570	800	1030	580	740
LEAD	320	200	170	130	210
MANGANESE	12	16	14	12	13
NICKEL	9	13	10	14	11
VANADIUM	50	20	20	40	30
ZINC	80	50	40	50	60
WATER SOLUBLES (ng/m^3)					
NITRATE	4150	3690	3340	3140	3610
SULFATE	8170	8950	11430	7200	8940
AMMONIUM	360	90	280	410	290
TSP ($\mu g/m^3$)	59	53	56	42	53
SAMPLE COUNT	15	13	13	12	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	<.1	<.1
CADMIUM	1.6	1.4	1.2	1.0	1.3
CHROMIUM	3	1	3	2	2
COPPER	30	40	30	70	40
IRON	610	700	660	590	640
LEAD	270	170	120	100	170
MANGANESE	13	13	10	11	12
NICKEL	22	10	10	11	13
VANADIUM	60	20	30	30	40
ZINC	70	50	20	50	50
WATER SOLUBLES (ng/m³)					
NITRATE	4410	4620	2920	2250	3660
SULFATE	8410	9910	10060	6470	8850
AMMONIUM	430	110	320	320	290
TSP (μg/m³)	52	51	45	43	48
SAMPLE COUNT	15	16	13	12[a]	

[a] For sulfate, the sample count is 11 in the fourth quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m³)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.2	1.4	1.1	0.8	1.4
CHROMIUM	2	1	2	1	2
COPPER	50	50	180	80	80
IRON	550	800	460	350	550
LEAD	190	170	90	70	130
MANGANESE	13	18	8	8	12
NICKEL	13	8	6	7	9
VANADIUM	40	20	10	20	20
ZINC	100	90	50	70	80
WATER SOLUBLES (ng/m³)					
NITRATE	3790	4720	2790	2210	3450
SULFATE	8550	10070	9680	7720	8980
AMMONIUM	220	40	30	110	110
TSP (µg/m³)	48	56	40	32	45
SAMPLE COUNT	14	14	10	13	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	005

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.1	1.4	1.2	0.8	1.3
CHROMIUM	3	1	2	2	2
COPPER	50	90	130	80	90
IRON	760	770	600	760	720
LEAD	260	170	130	100	160
MANGANESE	15	16	11	13	14
NICKEL	25	6	8	8	11
VANADIUM	90	10	10	20	30
ZINC	110	50	40	70	60
WATER SOLUBLES (ng/m^3)					
NITRATE	4080	3930	3120	2390	3370
SULFATE	8470	8990	9910	7270	8700
AMMONIUM	320	50	80	160	140
TSP ($\mu g/m^3$)	59	55	44	44	50
SAMPLE COUNT	12	16	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NORWALK	0820	012

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.9	3.2	1.5	3.3	2.5
CHROMIUM	2	1	2	2	2
COPPER	70	100	110	40	80
IRON	620	780	700	450	640
LEAD	240	160	140	80	160
MANGANESE	11	18	11	10	13
NICKEL	11	6	8	6	8
VANADIUM	30	10	10	10	20
ZINC	70	70	40	50	60
WATER SOLUBLES (ng/m3)					
NITRATE	4310	6330	3030	2560	4080
SULFATE	7860	8460	10260	7270	8480
AMMONIUM	170	50	120	190	130
TSP (µg/m3)	48	50	43	35	44
SAMPLE COUNT	15	15	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
NORWICH	0840	002

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	1.0	4.5	0.7	1.8
CHROMIUM	2	<1	5	2	2[a]
COPPER	180	280	310	160	230
IRON	580	540	1050	490	660
LEAD	200	130	200	90	150
MANGANESE	10	12	15	9	11
NICKEL	8	9	9	6	8
VANADIUM	20	20	20	10	20
ZINC	60	50	60	40	50
WATER SOLUBLES (ng/m^3)					
NITRATE	3890	3440	2420	2590	3100
SULFATE	6970	8710	9790	7560	8190
AMMONIUM	200	50	60	240	140
TSP (μg/m^3)	53	46	69	45	53
SAMPLE COUNT	15	13	13	15	

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

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.3	1.8	1.6	0.8	1.4
CHROMIUM	1	1	3	2	2
COPPER	60	230	150	150	150
IRON	530	1360	990	590	870
LEAD	190	180	130	90	150
MANGANESE	12	29	17	14	18
NICKEL	13	8	9	10	10
VANADIUM	40	10	10	20	20
ZINC	80	80	50	60	70
WATER SOLUBLES (ng/m^3)					
NITRATE	4180	5090	3270	2740	3790
SULFATE	7540	9440	9450	7510	8480
AMMONIUM	170	60	40	180	110
TSP ($\mu g/m^3$)	56	75	60	54	61
SAMPLE COUNT	13	14	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
STAMFORD	1080	007

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.3	2.5	2.2	2.4	2.4
CHROMIUM	1	1	3	2	2
COPPER	140	170	90	50	110
IRON	390	660	650	630	590
LEAD	240	150	120	120	160
MANGANESE	12	18	15	16	15
NICKEL	14	8	8	9	10
VANADIUM	40	10	10	20	20
ZINC	120	130	100	180	130
WATER SOLUBLES (ng/m3)					
NITRATE	4000	4910	3510	3290	3940
SULFATE	7140	9780	11000	8040	9040
AMMONIUM	160	70	160	240	160
TSP (µg/m3)	44	55	50	51	50
SAMPLE COUNT	14	15	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
STAMFORD	1080	021

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.3	3.1	0.9	1.2	1.9
CHROMIUM	2	1	3	2	2
COPPER	160	170	130	40	120
IRON	570	650	420	790	620
LEAD	220	180	100	120	150
MANGANESE	12	15	11	11	12
NICKEL	17	6	8	10	10
VANADIUM	50	10	10	10	20
ZINC	90	70	40	70	70
WATER SOLUBLES (ng/m3)					
NITRATE	4520	4720	3770	3400	4090
SULFATE	7250	9270	9460	7540	8370
AMMONIUM	250	70	50	230	150
TSP (μg/m3)	50	53	45	43	48
SAMPLE COUNT	12	14	12	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
STRATFORD	1110	005

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	2.1	2.8	1.1	1.1	1.8
CHROMIUM	5	2	2	3	3
COPPER	180	160	200	140	170
IRON	830	660	500	510	630
LEAD	360	260	140	160	230
MANGANESE	14	15	9	11	12
NICKEL	20	10	6	9	11
VANADIUM	60	20	20	20	30
ZINC	150	70	30	50	80
WATER SOLUBLES (ng/m^3)					
NITRATE	4750	3660	2910	2860	3560
SULFATE	8650	9340	9690	7710	8830
AMMONIUM	300	80	260	250	220
TSP ($\mu g/m^3$)	61	50	40	40	48
SAMPLE COUNT	15	15	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	0.9	1.5	0.7	0.8	1.0
CHROMIUM	3	2	2	2	2
COPPER	120	120	50	40	80
IRON	870	490	480	400	560
LEAD	290	140	80	80	150
MANGANESE	13	12	8	8	10
NICKEL	10	3	4	5	5
VANADIUM	30	10	10	10	20
ZINC	80	40	10	30	40
WATER SOLUBLES (ng/m3)					
NITRATE	3880	3120	1710	1990	2700
SULFATE	7430	8780	8110	7310	7920
AMMONIUM	190	90	160	150	150
TSP (μg/m3)	57	42	40	33	43
SAMPLE COUNT	15	16	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
VOLUNTOWN	1205	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.8	1.3	1.4	0.7	1.1
CHROMIUM	<1	<1	1	2	1[a]
COPPER	210	180	80	40	130
IRON	130	180	340	130	190
LEAD	70	40	30	30	40
MANGANESE	3	6	4	3	4
NICKEL	3	4	2	3	3
VANADIUM	10	10	<10	<10	10[b]
ZINC	70	30	<10	20	30[c]
WATER SOLUBLES (ng/m3)					
NITRATE	3110	2090	1590	1910	2210
SULFATE	6300	7280	7570	5190	6630
AMMONIUM	30	10	70	50	40
TSP (µg/m3)	23	32	26	19	25
SAMPLE COUNT	15	16	13	12	

[a] The average was calculated using one quarter of the reportable limit in the 1st and 2nd quarters.
[b] The average was calculated using one quarter of the reportable limit in the 3rd and 4th quarters.
[c] The average was calculated using one quarter of the reportable limit in the 3rd quarter.

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 HI-VOL TSP

TOWN	AREA	SITE
WALLINGFORD	1210	001

	QUARTERLY AVG				ANNUAL AVG
	1ST	2ND	3RD	4TH	
METALS (ng/m^3)					
BERYLLIUM	<.1	<.1	<.1	<.1	<.1
CADMIUM	1.3	2.3	1.3	1.0	1.5
CHROMIUM	4	1	2	3	3
COPPER	100	90	50	40	70
IRON	840	750	530	540	670
LEAD	260	160	100	100	160
MANGANESE	12	14	9	16	13
NICKEL	13	10	5	10	10
VANADIUM	40	20	10	20	20
ZINC	80	50	20	60	50
WATER SOLUBLES (ng/m^3)					
NITRATE	4540	3870	2060	2630	3280
SULFATE	8250	10080	10050	7740	9030
AMMONIUM	270	100	100	340	200
TSP ($\mu g/m^3$)	61	48	41	41	48
SAMPLE COUNT	15	15	15	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	4.2	3.1	2.6	1.3	2.8
CHROMIUM	12	5	6	6	7
COPPER	120	140	140	70	120
IRON	650	530	520	480	550
LEAD	290	170	130	120	180
MANGANESE	13	14	9	11	12
NICKEL	13	5	5	8	8
VANADIUM	40	10	10	20	20
ZINC	210	120	180	140	160
WATER SOLUBLES (ng/m3)					
NITRATE	4430	3650	2350	2900	3330
SULFATE		8570	9790	7450	
AMMONIUM	340	100	190	390	260
TSP (µg/m3)	59	46	43	41	47
SAMPLE COUNT	14[a]	14[b]	14	14	

[a] For sulfate, the sample count is 0 in the first quarter .
[b] For sulfate, the sample count is 10 in the second quarter .

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.6	1.0	1.6	0.8	1.3
CHROMIUM	11	4	3	4	6
COPPER	210	160	220	140	180
IRON	420	450	370	300	390
LEAD	170	130	100	70	120
MANGANESE	10	12	7	7	9
NICKEL	9	3	5	6	6
VANADIUM	30	10	10	20	20
ZINC	120	140	80	70	100
WATER SOLUBLES (ng/m^3)					
NITRATE	4830	4510	1950	3100	3610
SULFATE	8790	9680	9000	7640	8790
AMMONIUM	450	100	110	360	250
TSP ($\mu g/m^3$)	45	45	34	31	39
SAMPLE COUNT	15	15	15	14	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	3.3	3.7	2.4	1.5	2.7
CHROMIUM	9	7	9	7	8
COPPER	290	260	180	60	200
IRON	990	710	630	760	770
LEAD	340	200	170	170	220
MANGANESE	19	15	11	14	15
NICKEL	15	6	5	11	9
VANADIUM	50	10	10	30	30
ZINC	180	130	160	130	150
WATER SOLUBLES (ng/m3)					
NITRATE	4610	4390	2240	3090	3620
SULFATE	9700	9630	9900	7920	9280
AMMONIUM	410	170	150	340	270
TSP (μg/m3)	72	55	47	50	56
SAMPLE COUNT	15	16	14	15	

TABLE 9, CONTINUED

QUARTERLY CHEMICAL CHARACTERIZATION OF 1985 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	1.0	0.5	0.9	1.0	0.8
CHROMIUM	2	<1	2	1	1[a]
COPPER	50	70	70	40	60
IRON	710	320	340	430	450
LEAD	190	110	80	90	120
MANGANESE	10	8	5	7	8
NICKEL	19	6	10	19	13
VANADIUM	90	20	40	40	50
ZINC	60	40	10	40	40
WATER SOLUBLES (ng/m^3)					
NITRATE	4340	3460	2330	1970	3030
SULFATE	8180	8790	8640	8140	8440
AMMONIUM	240	70	120	220	160
TSP (µg/m^3)	57	37	35	35	41
SAMPLE COUNT	15	16	15	15	

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

TABLE 10

MONTHLY CHEMICAL CHARACTERIZATION OF 1985 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/m^3)													
BERYLLIUM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1		<.1	<.1	<.1	<.1
CADMIUM	0.4	0.6	1.4	0.2	0.9	0.6	0.7	1.0		0.5	0.3	0.4	0.6
CHROMIUM	2	2	1	1	<1	<1	<1	1		1	1	1	1[a]
COPPER	<10	10	<10	10	10	10	<10	10		10	<10	10	10[b]
IRON	510	690	580	540	440	380	320	360		250	170	270	410
LEAD	100	100	50	60	40	40	40	30		40	30	40	50
MANGANESE	8	9	8	10	11	9	5	6		6	5	6	8
NICKEL	6	12	7	7	7	5	9	8		6	6	10	8
VANADIUM	20	40	20	20	10	10	20	20		10	10	20	20
ZINC	30	50	20	80	20	20	<10	<10		30	20	30	30[c]
WATER SOLUBLES (ng/m^3)													
NITRATE	2670	3500	2670	3100	2470	2340	1340	1140		2150	2160	2760	2390
SULFATE	6260	6970	6670	8710	7500	7050	7500	8340		5120	6050	6700	6990
AMMONIUM	450	210	150	40	20	20	20	20		490	400	1080	260
TSP ($\mu g/m^3$)	45	50	42	45	49	37	26	27		23	20	35	36

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

TABLE 10, CONTINUED

MONTHLY CHEMICAL CHARACTERIZATION OF 1985 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/m^3)													
BERYLLIUM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
CADMIUM	0.5	0.5	0.5	0.6	0.7	0.7	0.5	0.4	0.9	0.6	0.1	0.6	0.6
CHROMIUM	3	4	4	1	1	<1	1	1	1	2	2	3	2[a]
COPPER	<10	10	<10	10	10	10	10	10	10	10	10	10	10[b]
IRON	1230	750	600	370	380	360	220	240	230	220	210	610	450
LEAD	120	120	70	100	60	50	50	60	50	60	40	70	70
MANGANESE	13	9	8	8	10	8	5	4	4	5	5	9	7
NICKEL	7	10	5	4	6	5	5	4	4	5	4	9	6
VANADIUM	20	30	10	10	10	10	10	10	10	10	20	10	10
ZINC	40	40	10	50	20	20	<10	<10	<10	20	20	30	20[c]
WATER SOLUBLES (ng/m^3)													
NITRATE	2470	3350	1990	2780	2910	2770	1850	2300	1970	1870	1850	2610	2390
SULFATE	5660	6580	5510	6880	7200	7310	7660	8750	8860	6160	8090	7480	7180
AMMONIUM	70	70	20	10	20	20	10	<10	60	80	40	470	70[d]
TSP ($\mu g/m^3$)	47	50	41	37	53	38	28	29	30	25	27	51	38

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

TABLE 11

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)		RANK	1	2	3	4	5	6	7	8	9	10
ANSONIA-004 (59)		TSP	97	78	76	75	73	73	69	68	68	67
		DATE	12/27/85	12/ 9/85	1/19/85	4/19/85	2/24/85	5/ 1/85	5/13/85	1/31/85	10/10/85	6/18/85
METEOROLOGICAL SITE		DIR (DEG)	220	270	240	260	210	300	230	30	240	230
	NEWARK	VEL (MPH)	12.6	4.9	8.5	8.4	10.4	3.2	10.7	7.1	13.0	9.1
		SPD (MPH)	13.2	5.8	10.1	11.4	11.2	9.6	11.8	7.5	13.7	10.2
		RATIO	0.952	0.848	0.841	0.735	0.924	0.335	0.909	0.950	0.955	0.894
METEOROLOGICAL SITE		DIR (DEG)	210	330	240	340	190	10	180	10	230	190
	BRADLEY	VEL (MPH)	8.2	2.8	5.0	3.2	8.2	5.4	7.3	5.1	5.0	8.1
		SPD (MPH)	9.2	3.7	5.5	4.5	8.6	7.5	9.1	5.3	9.1	8.2
		RATIO	0.893	0.759	0.911	0.717	0.949	0.717	0.807	0.966	0.553	0.989
METEOROLOGICAL SITE		DIR (DEG)	240	270	260	180	240	280	200	40	240	220
	BRIDGEPORT	VEL (MPH)	14.6	5.6	9.6	3.1	8.6	2.9	7.4	10.5	9.3	6.7
		SPD (MPH)	14.8	5.9	11.1	7.2	8.6	8.6	8.1	10.8	9.5	7.0
		RATIO	0.988	0.945	0.864	0.438	0.997	0.341	0.916	0.974	0.978	0.946
METEOROLOGICAL SITE		DIR (DEG)	220	280	260	300	260	290	220	60	250	210
	WORCESTER	VEL (MPH)	11.8	5.7	5.3	5.6	13.6	9.5	8.4	4.0	9.6	7.4
		SPD (MPH)	12.4	6.3	7.3	10.5	16.0	11.9	9.5	5.2	10.1	7.8
		RATIO	0.957	0.904	0.726	0.534	0.851	0.793	0.886	0.763	0.955	0.950
BRIDGEPORT-001 (59)		TSP	111	87	83	77	76	70	70	69	66	65
		DATE	5/ 1/85	4/19/85	4/25/85	12/27/85	5/13/85	1/ 7/85	9/ 4/85	1/19/85	6/18/85	3/ 8/85
METEOROLOGICAL SITE		DIR (DEG)	300	260	320	220	230	40	250	240	230	220
	NEWARK	VEL (MPH)	3.2	8.4	5.4	12.6	10.7	2.8	11.8	8.5	9.1	11.1
		SPD (MPH)	9.6	11.4	8.9	13.2	11.8	6.6	12.5	10.1	10.2	12.1
		RATIO	0.335	0.735	0.604	0.952	0.909	0.417	0.944	0.841	0.894	0.921
METEOROLOGICAL SITE		DIR (DEG)	10	340	200	210	180	10	240	240	190	240
	BRADLEY	VEL (MPH)	5.4	3.2	2.3	8.2	7.3	6.8	5.3	5.0	8.1	4.9
		SPD (MPH)	7.5	4.5	6.5	9.2	9.1	7.5	8.3	5.5	8.2	8.1
		RATIO	0.717	0.717	0.359	0.893	0.807	0.910	0.635	0.911	0.989	0.606
METEOROLOGICAL SITE		DIR (DEG)	280	180	230	240	200	40	260	260	220	240
	BRIDGEPORT	VEL (MPH)	2.9	3.1	3.3	14.6	7.4	9.6	9.7	9.6	6.7	10.7
		SPD (MPH)	8.6	7.2	5.3	14.8	8.1	11.1	9.8	11.1	7.0	10.8
		RATIO	0.341	0.438	0.620	0.988	0.916	0.870	0.992	0.864	0.946	0.996
METEOROLOGICAL SITE		DIR (DEG)	290	300	250	220	220	70	250	260	210	270
	WORCESTER	VEL (MPH)	9.5	5.6	11.0	11.8	8.4	7.9	11.6	5.3	7.4	19.6
		SPD (MPH)	11.9	10.5	11.5	12.4	9.5	8.1	12.1	7.3	7.8	20.4
		RATIO	0.793	0.534	0.955	0.957	0.886	0.985	0.957	0.726	0.950	0.958
BRIDGEPORT-009 (57)		TSP	91	87	85	85	77	76	72	69	68	65
		DATE	5/ 1/85	4/25/85	4/19/85	5/13/85	9/ 4/85	2/24/85	1/ 7/85	12/27/85	6/18/85	3/ 8/85
METEOROLOGICAL SITE		DIR (DEG)	300	320	260	230	250	210	40	220	230	220
	NEWARK	VEL (MPH)	3.2	5.4	8.4	10.7	11.8	10.4	2.8	12.6	9.1	11.1
		SPD (MPH)	9.6	8.9	11.4	11.8	12.5	11.2	6.6	13.2	10.2	12.1
		RATIO	0.335	0.604	0.735	0.909	0.944	0.924	0.417	0.952	0.894	0.921
METEOROLOGICAL SITE		DIR (DEG)	10	200	340	180	240	190	10	210	190	240
	BRADLEY	VEL (MPH)	5.4	2.3	3.2	7.3	5.3	8.2	6.8	8.2	8.1	4.9
		SPD (MPH)	7.5	6.5	4.5	9.1	8.3	8.6	7.5	9.2	8.2	8.1
		RATIO	0.717	0.359	0.717	0.807	0.635	0.949	0.910	0.893	0.989	0.606

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	280	230	180	200	260	240	40	240	220	240
BRIDGEPORT	VEL (MPH)	2.9	3.3	3.1	7.4	9.7	8.6	9.6	14.6	6.7	10.7
	SPD (MPH)	8.6	5.3	7.2	8.1	9.8	8.6	11.1	14.8	7.0	10.8
	RATIO	0.341	0.620	0.438	0.916	0.992	0.997	0.870	0.988	0.946	0.996
METEOROLOGICAL SITE	DIR (DEG)	290	250	300	220	250	260	70	220	210	270
WORCESTER	VEL (MPH)	9.5	11.0	5.6	8.4	11.6	13.6	7.9	11.8	7.4	19.6
	SPD (MPH)	11.9	11.5	10.5	9.5	12.1	16.0	8.1	12.4	7.8	20.4
	RATIO	0.793	0.955	0.534	0.886	0.957	0.851	0.985	0.957	0.950	0.958
BRIDGEPORT-123 (57)	TSP	139	137	129	118	105	102	101	98	96	94
	DATE	7/ 6/85	9/22/85	5/ 1/85	2/24/85	5/13/85	4/25/85	12/27/85	2/18/85	4/19/85	6/12/85
METEOROLOGICAL SITE	DIR (DEG)	200	100	300	210	230	320	220	260	260	290
NEWARK	VEL (MPH)	7.6	4.8	3.2	10.4	10.7	5.4	12.6	10.0	8.4	6.3
	SPD (MPH)	8.3	7.5	9.6	11.2	11.8	8.9	13.2	11.8	11.4	12.2
	RATIO	0.913	0.640	0.335	0.924	0.909	0.604	0.952	0.847	0.735	0.517
METEOROLOGICAL SITE	DIR (DEG)	180	30	10	190	180	200	210	270	340	20
BRADLEY	VEL (MPH)	6.9	5.0	5.4	8.2	7.3	2.3	8.2	8.8	3.2	5.0
	SPD (MPH)	7.0	6.0	7.5	8.6	9.1	6.5	9.2	10.1	4.5	5.3
	RATIO	0.981	0.831	0.717	0.949	0.807	0.359	0.893	0.871	0.717	0.940
METEOROLOGICAL SITE	DIR (DEG)	190	80	280	240	200	230	240	270	180	40
BRIDGEPORT	VEL (MPH)	6.7	8.5	2.9	8.6	7.4	3.3	14.6	10.4	3.1	6.1
	SPD (MPH)	7.0	9.2	8.6	8.6	8.1	5.3	14.8	10.6	7.2	8.1
	RATIO	0.957	0.921	0.341	0.997	0.916	0.620	0.988	0.981	0.438	0.761
METEOROLOGICAL SITE	DIR (DEG)	210	40	290	260	220	250	220	290	300	40
WORCESTER	VEL (MPH)	8.3	8.7	9.5	13.6	8.4	11.0	11.8	16.9	5.6	7.3
	SPD (MPH)	8.6	8.8	11.9	16.0	9.5	11.5	12.4	17.3	10.5	9.1
	RATIO	0.966	0.989	0.793	0.851	0.886	0.955	0.957	0.981	0.534	0.806
BRISTOL-001 (60)	TSP	79	74	65	65	63	62	62	61	60	58
	DATE	1/ 7/85	2/18/85	12/27/85	3/20/85	5/13/85	3/ 8/85	9/ 4/85	4/19/85	1/31/85	5/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	40	260	220	250	230	220	250	260	30	300
NEWARK	VEL (MPH)	2.8	10.0	12.6	9.5	10.7	11.1	11.8	8.4	7.1	3.2
	SPD (MPH)	6.6	11.8	13.2	13.9	11.8	12.1	12.5	11.4	7.5	9.6
	RATIO	0.417	0.847	0.952	0.678	0.909	0.921	0.944	0.735	0.950	0.335
METEOROLOGICAL SITE	DIR (DEG)	10	270	210	290	180	240	240	340	10	10
BRADLEY	VEL (MPH)	6.8	8.8	8.2	6.8	7.3	4.9	5.3	3.2	5.1	5.4
	SPD (MPH)	7.5	10.1	9.2	10.1	9.1	8.1	8.3	4.5	5.3	7.5
	RATIO	0.910	0.871	0.893	0.674	0.807	0.606	0.635	0.717	0.966	0.717
METEOROLOGICAL SITE	DIR (DEG)	40	270	240	270	200	240	260	180	40	280
BRIDGEPORT	VEL (MPH)	9.6	10.4	14.6	7.6	7.4	10.7	9.7	3.1	10.5	2.9
	SPD (MPH)	11.1	10.6	14.8	10.2	8.1	10.8	9.8	7.2	10.8	8.6
	RATIO	0.870	0.981	0.988	0.740	0.916	0.996	0.992	0.438	0.974	0.341
METEOROLOGICAL SITE	DIR (DEG)	70	290	220	280	220	270	250	300	60	290
WORCESTER	VEL (MPH)	7.9	16.9	11.8	14.0	8.4	19.6	11.6	5.6	4.0	9.5
	SPD (MPH)	8.1	17.3	12.4	15.2	9.5	20.4	12.1	10.5	5.2	11.9
	RATIO	0.985	0.981	0.957	0.916	0.886	0.958	0.957	0.534	0.763	0.793

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BURLINGTON-001 (59)	TSP	62	52	46	37	37	37	36	33	33	31
	DATE	5/13/85	5/ 1/85	9/ 4/85	5/31/85	5/25/85	6/18/85	7/ 6/85	4/19/85	6/24/85	12/27/85
METEOROLOGICAL SITE	DIR (DEG)	230	300	250	190	120	230	200	260	240	220
NEWARK	VEL (MPH)	10.7	3.2	11.8	9.9	3.3	9.1	7.6	8.4	8.7	12.6
	SPD (MPH)	11.8	9.6	12.5	10.2	7.5	10.2	8.3	11.4	9.8	13.2
	RATIO	0.909	0.335	0.944	0.969	0.438	0.894	0.913	0.735	0.889	0.952
METEOROLOGICAL SITE	DIR (DEG)	180	10	240	190	170	190	180	340	220	210
BRADLEY	VEL (MPH)	7.3	5.4	5.3	9.9	1.9	8.1	6.9	3.2	5.3	8.2
	SPD (MPH)	9.1	7.5	8.3	10.1	4.6	8.2	7.0	4.5	8.8	9.2
	RATIO	0.807	0.717	0.635	0.989	0.407	0.989	0.981	0.717	0.606	0.893
METEOROLOGICAL SITE	DIR (DEG)	200	280	260	190	110	220	190	180	230	240
BRIDGEPORT	VEL (MPH)	7.4	2.9	9.7	7.2	3.9	6.7	6.7	3.1	6.3	14.6
	SPD (MPH)	8.1	8.6	9.8	7.5	4.7	7.0	7.0	7.2	8.3	14.8
	RATIO	0.916	0.341	0.992	0.967	0.828	0.946	0.957	0.438	0.756	0.988
METEOROLOGICAL SITE	DIR (DEG)	220	290	250	200	210	210	210	300	230	220
WORCESTER	VEL (MPH)	8.4	9.5	11.6	13.8	7.7	7.4	8.3	5.6	8.0	11.8
	SPD (MPH)	9.5	11.9	12.1	13.9	8.9	7.8	8.6	10.5	9.9	12.4
	RATIO	0.886	0.793	0.957	0.988	0.861	0.950	0.966	0.534	0.802	0.957
DANBURY-002 (61)	TSP	120	88	87	85	79	76	75	67	66	62
	DATE	3/ 2/85	1/ 7/85	1/31/85	5/ 1/85	4/19/85	12/ 9/85	2/18/85	9/ 4/85	3/20/85	3/ 8/85
METEOROLOGICAL SITE	DIR (DEG)	300	40	30	300	260	270	260	250	250	220
NEWARK	VEL (MPH)	13.3	2.8	7.1	3.2	8.4	4.9	10.0	11.8	9.5	11.1
	SPD (MPH)	15.4	6.6	7.5	9.6	11.4	5.8	11.8	12.5	13.9	12.1
	RATIO	0.864	0.417	0.950	0.335	0.735	0.848	0.847	0.944	0.678	0.921
METEOROLOGICAL SITE	DIR (DEG)	310	10	10	10	340	330	270	240	290	240
BRADLEY	VEL (MPH)	9.0	6.8	5.1	5.4	3.2	2.8	8.8	5.3	6.8	4.9
	SPD (MPH)	10.9	7.5	5.3	7.5	4.5	3.7	10.1	8.3	10.1	8.1
	RATIO	0.823	0.910	0.966	0.717	0.717	0.759	0.871	0.635	0.674	0.606
METEOROLOGICAL SITE	DIR (DEG)	300	40	40	280	180	270	270	260	270	240
BRIDGEPORT	VEL (MPH)	9.6	9.6	10.5	2.9	3.1	5.6	10.4	9.7	7.6	10.7
	SPD (MPH)	10.8	11.1	10.8	8.6	7.2	5.9	10.6	9.8	10.2	10.8
	RATIO	0.894	0.870	0.974	0.341	0.438	0.945	0.981	0.992	0.740	0.996
METEOROLOGICAL SITE	DIR (DEG)	300	70	60	290	300	280	290	250	280	270
WORCESTER	VEL (MPH)	14.3	7.9	4.0	9.5	5.6	5.7	16.9	11.6	14.0	19.6
	SPD (MPH)	16.2	8.1	5.2	11.9	10.5	6.3	17.3	12.1	15.2	20.4
	RATIO	0.880	0.985	0.763	0.793	0.534	0.904	0.981	0.957	0.916	0.958
DANBURY-123 (58)	TSP	104	97	90	83	83	80	77	75	73	69
	DATE	3/ 2/85	2/18/85	3/ 8/85	1/25/85	12/ 9/85	5/ 1/85	1/31/85	2/24/85	4/19/85	1/ 7/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	220	250	270	300	30	210	260	40
NEWARK	VEL (MPH)	13.3	10.0	11.1	6.9	4.9	3.2	7.1	10.4	8.4	2.8
	SPD (MPH)	15.4	11.8	12.1	9.6	5.8	9.6	7.5	11.2	11.4	6.6
	RATIO	0.864	0.847	0.921	0.719	0.848	0.335	0.950	0.924	0.735	0.417
METEOROLOGICAL SITE	DIR (DEG)	310	270	240	240	330	10	10	190	340	10
BRADLEY	VEL (MPH)	9.0	8.8	4.9	4.0	2.8	5.4	5.1	8.2	3.2	6.8
	SPD (MPH)	10.9	10.1	8.1	5.9	3.7	7.5	5.3	8.6	4.5	7.5
	RATIO	0.823	0.871	0.606	0.676	0.759	0.717	0.966	0.949	0.717	0.910

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	300	270	240	250	270	280	40	240	180	40
BRIDGEPORT	VEL (MPH)	9.6	10.4	10.7	8.1	5.6	2.9	10.5	8.6	3.1	9.6
	SPD (MPH)	10.8	10.6	10.8	8.9	5.9	8.6	10.8	8.6	7.2	11.1
	RATIO	0.894	0.981	0.996	0.907	0.945	0.341	0.974	0.997	0.438	0.870
METEOROLOGICAL SITE	DIR (DEG)	300	290	270	280	280	290	60	260	300	70
WORCESTER	VEL (MPH)	14.3	16.9	19.6	5.9	5.7	9.5	4.0	13.6	5.6	7.9
	SPD (MPH)	16.2	17.3	20.4	7.3	6.3	11.9	5.2	16.0	10.5	8.1
	RATIO	0.880	0.981	0.958	0.802	0.904	0.793	0.763	0.851	0.534	0.985
EAST HARTFORD-004 (57)	TSP	88	80	73	72	72	69	69	69	68	65
	DATE	5/ 1/85	12/21/85	3/20/85	4/19/85	3/ 8/85	12/27/85	2/18/85	1/31/85	5/13/85	1/25/85
METEOROLOGICAL SITE	DIR (DEG)	300	300	250	260	220	220	260	30	230	250
NEWARK	VEL (MPH)	3.2	7.9	9.5	8.4	11.1	12.6	10.0	7.1	10.7	6.9
	SPD (MPH)	9.6	8.6	13.9	11.4	12.1	13.2	11.8	7.5	11.8	9.6
	RATIO	0.335	0.914	0.678	0.735	0.921	0.952	0.847	0.950	0.909	0.719
METEOROLOGICAL SITE	DIR (DEG)	10	330	290	340	240	210	270	10	180	240
BRADLEY	VEL (MPH)	5.4	4.7	6.8	3.2	4.9	8.2	8.8	5.1	7.3	4.0
	SPD (MPH)	7.5	6.5	10.1	4.5	8.1	9.2	10.1	5.3	9.1	5.9
	RATIO	0.717	0.731	0.674	0.717	0.606	0.893	0.871	0.966	0.807	0.676
METEOROLOGICAL SITE	DIR (DEG)	280	310	270	180	240	240	270	40	200	250
BRIDGEPORT	VEL (MPH)	2.9	8.0	7.6	3.1	10.7	14.6	10.4	10.5	7.4	8.1
	SPD (MPH)	8.6	9.2	10.2	7.2	10.8	14.8	10.6	10.8	8.1	8.9
	RATIO	0.341	0.865	0.740	0.438	0.996	0.988	0.981	0.974	0.916	0.907
METEOROLOGICAL SITE	DIR (DEG)	290	310	280	300	270	220	290	60	220	280
WORCESTER	VEL (MPH)	9.5	5.1	14.0	5.6	19.6	11.8	16.9	4.0	8.4	5.9
	SPD (MPH)	11.9	7.0	15.2	10.5	20.4	12.4	17.3	5.2	9.5	7.3
	RATIO	0.793	0.724	0.916	0.534	0.958	0.957	0.981	0.763	0.886	0.802
GREENWICH-008 (60)	TSP	113	108	92	81	78	76	75	73	70	69
	DATE	5/ 1/85	4/19/85	9/ 4/85	6/18/85	10/10/85	12/ 9/85	12/27/85	5/13/85	3/20/85	6/24/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	250	230	240	270	220	230	250	240
NEWARK	VEL (MPH)	3.2	8.4	11.8	9.1	13.0	4.9	12.6	10.7	9.5	8.7
	SPD (MPH)	9.6	11.4	12.5	10.2	13.7	5.8	13.2	11.8	13.9	9.8
	RATIO	0.335	0.735	0.944	0.894	0.955	0.848	0.952	0.909	0.678	0.889
METEOROLOGICAL SITE	DIR (DEG)	10	340	240	190	230	330	210	180	290	220
BRADLEY	VEL (MPH)	5.4	3.2	5.3	8.1	5.0	2.8	8.2	7.3	6.8	5.3
	SPD (MPH)	7.5	4.5	8.3	8.2	9.1	3.7	9.2	9.1	10.1	8.8
	RATIO	0.717	0.717	0.635	0.989	0.553	0.759	0.893	0.807	0.674	0.606
METEOROLOGICAL SITE	DIR (DEG)	280	180	260	220	240	270	240	200	270	230
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.7	6.7	9.3	5.6	14.6	7.4	7.6	6.3
	SPD (MPH)	8.6	7.2	9.8	7.0	9.5	5.9	14.8	8.1	10.2	8.3
	RATIO	0.341	0.438	0.992	0.946	0.978	0.945	0.988	0.916	0.740	0.756
METEOROLOGICAL SITE	DIR (DEG)	290	300	250	210	250	280	220	220	280	230
WORCESTER	VEL (MPH)	9.5	5.6	11.6	7.4	9.6	5.7	11.8	8.4	14.0	8.0
	SPD (MPH)	11.9	10.5	12.1	7.8	10.1	6.3	12.4	9.5	15.2	9.9
	RATIO	0.793	0.534	0.957	0.950	0.955	0.904	0.957	0.886	0.916	0.802

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
GROTON-006 (59)	TSP	84	84	77	73	71	64	55	54	54	51
	DATE	5/ 1/85	4/19/85	10/10/85	1/31/85	12/27/85	2/18/85	5/19/85	3/20/85	3/ 8/85	7/30/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	240	30	220	260	280	250	220	290
NEWARK	VEL (MPH)	3.2	8.4	13.0	7.1	12.6	10.0	12.0	9.5	11.1	6.0
	SPD (MPH)	9.6	11.4	13.7	7.5	13.2	11.8	14.2	13.9	12.1	9.9
	RATIO	0.335	0.735	0.955	0.950	0.952	0.847	0.842	0.678	0.921	0.609
METEOROLOGICAL SITE	DIR (DEG)	10	340	230	10	210	270	290	290	240	290
BRADLEY	VEL (MPH)	5.4	3.2	5.0	5.1	8.2	8.8	7.8	6.8	4.9	4.4
	SPD (MPH)	7.5	4.5	9.1	5.3	9.2	10.1	9.3	10.1	8.1	6.0
	RATIO	0.717	0.717	0.553	0.966	0.893	0.871	0.832	0.674	0.606	0.723
METEOROLOGICAL SITE	DIR (DEG)	280	180	240	40	240	270	300	270	240	260
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.3	10.5	14.6	10.4	9.9	7.6	10.7	6.3
	SPD (MPH)	8.6	7.2	9.5	10.8	14.8	10.6	10.2	10.2	10.8	7.9
	RATIO	0.341	0.438	0.978	0.974	0.988	0.981	0.972	0.740	0.996	0.792
METEOROLOGICAL SITE	DIR (DEG)	290	300	250	60	220	290	270	280	270	280
WORCESTER	VEL (MPH)	9.5	5.6	9.6	4.0	11.8	16.9	10.9	14.0	19.6	5.0
	SPD (MPH)	11.9	10.5	10.1	5.2	12.4	17.3	11.5	15.2	20.4	7.5
	RATIO	0.793	0.534	0.955	0.763	0.957	0.981	0.946	0.916	0.958	0.674
HARTFORD-003 (58)	TSP	99	92	92	83	82	79	78	78	77	75
	DATE	5/ 1/85	4/19/85	1/ 7/85	12/27/85	1/31/85	12/21/85	9/ 4/85	2/18/85	3/20/85	5/13/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	40	220	30	300	250	260	250	230
NEWARK	VEL (MPH)	3.2	8.4	2.8	12.6	7.1	7.9	11.8	10.0	9.5	10.7
	SPD (MPH)	9.6	11.4	6.6	13.2	7.5	8.6	12.5	11.8	13.9	11.8
	RATIO	0.335	0.735	0.417	0.952	0.950	0.914	0.944	0.847	0.678	0.909
METEOROLOGICAL SITE	DIR (DEG)	10	340	10	210	10	330	240	270	290	180
BRADLEY	VEL (MPH)	5.4	3.2	6.8	8.2	5.1	4.7	5.3	8.8	6.8	7.3
	SPD (MPH)	7.5	4.5	7.5	9.2	5.3	6.5	8.3	10.1	10.1	9.1
	RATIO	0.717	0.717	0.910	0.893	0.966	0.731	0.635	0.871	0.674	0.807
METEOROLOGICAL SITE	DIR (DEG)	280	180	40	240	40	310	260	270	270	200
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.6	14.6	10.5	8.0	9.7	10.4	7.6	7.4
	SPD (MPH)	8.6	7.2	11.1	14.8	10.8	9.2	9.8	10.6	10.2	8.1
	RATIO	0.341	0.438	0.870	0.988	0.974	0.865	0.992	0.981	0.740	0.916
METEOROLOGICAL SITE	DIR (DEG)	290	300	70	220	60	310	250	290	280	220
WORCESTER	VEL (MPH)	9.5	5.6	7.9	11.8	4.0	5.1	11.6	16.9	14.0	8.4
	SPD (MPH)	11.9	10.5	8.1	12.4	5.2	7.0	12.1	17.3	15.2	9.5
	RATIO	0.793	0.534	0.985	0.957	0.763	0.724	0.957	0.981	0.916	0.886
HARTFORD-013 (46)	TSP	102	95	91	69	68	68	67	67	66	63
	DATE	4/19/85	5/ 1/85	5/13/85	6/18/85	1/31/85	12/21/85	12/27/85	1/ 7/85	4/25/85	10/10/85
METEOROLOGICAL SITE	DIR (DEG)	260	300	230	230	30	300	220	40	320	240
NEWARK	VEL (MPH)	8.4	3.2	10.7	9.1	7.1	7.9	12.6	2.8	5.4	13.0
	SPD (MPH)	11.4	9.6	11.8	10.2	7.5	8.6	13.2	6.6	8.9	13.7
	RATIO	0.735	0.335	0.909	0.894	0.950	0.914	0.952	0.417	0.604	0.955
METEOROLOGICAL SITE	DIR (DEG)	340	10	180	190	10	330	210	10	200	230
BRADLEY	VEL (MPH)	3.2	5.4	7.3	8.1	5.1	4.7	8.2	6.8	2.3	5.0
	SPD (MPH)	4.5	7.5	9.1	8.2	5.3	6.5	9.2	7.5	6.5	9.1
	RATIO	0.717	0.717	0.807	0.989	0.966	0.731	0.893	0.910	0.359	0.553

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	180	280	200	220	40	310	240	40	230	240
BRIDGEPORT	VEL (MPH)	3.1	2.9	7.4	6.7	10.5	8.0	14.6	9.6	3.3	9.3
	SPD (MPH)	7.2	8.6	8.1	7.0	10.8	9.2	14.8	11.1	5.3	9.5
	RATIO	0.438	0.341	0.916	0.946	0.974	0.865	0.988	0.870	0.620	0.978
METEOROLOGICAL SITE	DIR (DEG)	300	290	220	210	60	310	220	70	250	250
WORCESTER	VEL (MPH)	5.6	9.5	8.4	7.4	4.0	5.1	11.8	7.9	11.0	9.6
	SPD (MPH)	10.5	11.9	9.5	7.8	5.2	7.0	12.4	8.1	11.5	10.1
	RATIO	0.534	0.793	0.886	0.950	0.763	0.724	0.957	0.985	0.955	0.955
HARTFORD-014 (58)	TSP	85	83	81	71	70	68	68	66	64	63
	DATE	4/19/85	1/31/85	5/ 1/85	9/ 4/85	1/ 7/85	5/13/85	12/21/85	10/22/85	2/24/85	10/10/85
METEOROLOGICAL SITE	DIR (DEG)	260	30	300	250	40	230	300	60	210	240
NEWARK	VEL (MPH)	8.4	7.1	3.2	11.8	2.8	10.7	7.9	6.8	10.4	13.0
	SPD (MPH)	11.4	7.5	9.6	12.5	6.6	11.8	8.6	10.4	11.2	13.7
	RATIO	0.735	0.950	0.335	0.944	0.417	0.909	0.914	0.660	0.924	0.955
METEOROLOGICAL SITE	DIR (DEG)	340	10	10	240	10	180	330	200	190	230
BRADLEY	VEL (MPH)	3.2	5.1	5.4	5.3	6.8	7.3	4.7	1.8	8.2	5.0
	SPD (MPH)	4.5	5.3	7.5	8.3	7.5	9.1	6.5	2.2	8.6	9.1
	RATIO	0.717	0.966	0.717	0.635	0.910	0.807	0.731	0.844	0.949	0.553
METEOROLOGICAL SITE	DIR (DEG)	180	40	280	260	40	200	310	80	240	240
BRIDGEPORT	VEL (MPH)	3.1	10.5	2.9	9.7	9.6	7.4	8.0	4.9	8.6	9.3
	SPD (MPH)	7.2	10.8	8.6	9.8	11.1	8.1	9.2	5.8	8.6	9.5
	RATIO	0.438	0.974	0.341	0.992	0.870	0.916	0.865	0.857	0.997	0.978
METEOROLOGICAL SITE	DIR (DEG)	300	60	290	250	70	220	310	260	260	250
WORCESTER	VEL (MPH)	5.6	4.0	9.5	11.6	7.9	8.4	5.1	7.2	13.6	9.6
	SPD (MPH)	10.5	5.2	11.9	12.1	8.1	9.5	7.0	7.3	16.0	10.1
	RATIO	0.534	0.763	0.793	0.957	0.985	0.886	0.724	0.986	0.851	0.955
MANCHESTER-001 (55)	TSP	122	88	81	72	65	65	56	56	52	52
	DATE	1/31/85	3/20/85	5/13/85	5/ 1/85	9/ 4/85	4/19/85	5/ 7/85	1/ 7/85	12/ 9/85	12/21/85
METEOROLOGICAL SITE	DIR (DEG)	30	250	230	300	250	260	300	40	270	300
NEWARK	VEL (MPH)	7.1	9.5	10.7	3.2	11.8	8.4	14.4	2.8	4.9	7.9
	SPD (MPH)	7.5	13.9	11.8	9.6	12.5	11.4	15.2	6.6	5.8	8.6
	RATIO	0.950	0.678	0.909	0.335	0.944	0.735	0.944	0.417	0.848	0.914
METEOROLOGICAL SITE	DIR (DEG)	10	290	180	10	240	340	310	10	330	330
BRADLEY	VEL (MPH)	5.1	6.8	7.3	5.4	5.3	3.2	5.5	6.8	2.8	4.7
	SPD (MPH)	5.3	10.1	9.1	7.5	8.3	4.5	7.2	7.5	3.7	6.5
	RATIO	0.966	0.674	0.807	0.717	0.635	0.717	0.772	0.910	0.759	0.731
METEOROLOGICAL SITE	DIR (DEG)	40	270	200	280	260	180	300	40	270	310
BRIDGEPORT	VEL (MPH)	10.5	7.6	7.4	2.9	9.7	3.1	9.1	9.6	5.6	8.0
	SPD (MPH)	10.8	10.2	8.1	8.6	9.8	7.2	10.1	11.1	5.9	9.2
	RATIO	0.974	0.740	0.916	0.341	0.992	0.438	0.900	0.870	0.945	0.865
METEOROLOGICAL SITE	DIR (DEG)	60	280	220	290	250	300	280	70	280	310
WORCESTER	VEL (MPH)	4.0	14.0	8.4	9.5	11.6	5.6	8.9	7.9	5.7	5.1
	SPD (MPH)	5.2	15.2	9.5	11.9	12.1	10.5	10.5	8.1	6.3	7.0
	RATIO	0.763	0.916	0.886	0.793	0.957	0.534	0.847	0.985	0.904	0.724

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
MERIDEN-002 (59)	TSP	101	96	88	84	81	81	80	78	73	69
	DATE	12/27/85	5/ 1/85	3/26/85	3/ 8/85	4/19/85	3/20/85	2/18/85	2/24/85	1/31/85	12/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	220	300	300	220	260	250	260	210	30	270
NEWARK	VEL (MPH)	12.6	3.2	11.0	11.1	8.4	9.5	10.0	10.4	7.1	4.9
	SPD (MPH)	13.2	9.6	12.8	12.1	11.4	13.9	11.8	11.2	7.5	5.8
	RATIO	0.952	0.335	0.858	0.921	0.735	0.678	0.847	0.924	0.950	0.848
METEOROLOGICAL SITE	DIR (DEG)	210	10	330	240	340	290	270	190	10	330
BRADLEY	VEL (MPH)	8.2	5.4	7.3	4.9	3.2	6.8	8.8	8.2	5.1	2.8
	SPD (MPH)	9.2	7.5	7.5	8.1	4.5	10.1	10.1	8.6	5.3	3.7
	RATIO	0.893	0.717	0.978	0.606	0.717	0.674	0.871	0.949	0.966	0.759
METEOROLOGICAL SITE	DIR (DEG)	240	280	320	240	180	270	270	240	40	270
BRIDGEPORT	VEL (MPH)	14.6	2.9	9.8	10.7	3.1	7.6	10.4	8.6	10.5	5.6
	SPD (MPH)	14.8	8.6	10.5	10.8	7.2	10.2	10.6	8.6	10.8	5.9
	RATIO	0.988	0.341	0.931	0.996	0.438	0.740	0.981	0.997	0.974	0.945
METEOROLOGICAL SITE	DIR (DEG)	220	290	330	270	300	280	290	260	60	280
WORCESTER	VEL (MPH)	11.8	9.5	13.2	19.6	5.6	14.0	16.9	13.6	4.0	5.7
	SPD (MPH)	12.4	11.9	13.8	20.4	10.5	15.2	17.3	16.0	5.2	6.3
	RATIO	0.957	0.793	0.960	0.958	0.534	0.916	0.981	0.851	0.763	0.904
MIDDLETOWN-003 (57)	TSP	100	81	73	72	71	71	70	69	68	67
	DATE	4/19/85	5/ 1/85	2/18/85	12/ 9/85	3/20/85	12/21/85	12/27/85	9/ 4/85	1/ 7/85	6/18/85
METEOROLOGICAL SITE	DIR (DEG)	260	300	260	270	250	300	220	250	40	230
NEWARK	VEL (MPH)	8.4	3.2	10.0	4.9	9.5	7.9	12.6	11.8	2.8	9.1
	SPD (MPH)	11.4	9.6	11.8	5.8	13.9	8.6	13.2	12.5	6.6	10.2
	RATIO	0.735	0.335	0.847	0.848	0.678	0.914	0.952	0.944	0.417	0.894
METEOROLOGICAL SITE	DIR (DEG)	340	10	270	330	290	330	210	240	10	190
BRADLEY	VEL (MPH)	3.2	5.4	8.8	2.8	6.8	4.7	8.2	5.3	6.8	8.1
	SPD (MPH)	4.5	7.5	10.1	3.7	10.1	6.5	9.2	8.3	7.5	8.2
	RATIO	0.717	0.717	0.871	0.759	0.674	0.731	0.893	0.635	0.910	0.989
METEOROLOGICAL SITE	DIR (DEG)	180	280	270	270	270	310	240	260	40	220
BRIDGEPORT	VEL (MPH)	3.1	2.9	10.4	5.6	7.6	8.0	14.6	9.7	9.6	6.7
	SPD (MPH)	7.2	8.6	10.6	5.9	10.2	9.2	14.8	9.8	11.1	7.0
	RATIO	0.438	0.341	0.981	0.945	0.740	0.865	0.988	0.992	0.870	0.946
METEOROLOGICAL SITE	DIR (DEG)	300	290	290	280	280	310	220	250	70	210
WORCESTER	VEL (MPH)	5.6	9.5	16.9	5.7	14.0	5.1	11.8	11.6	7.9	7.4
	SPD (MPH)	10.5	11.9	17.3	6.3	15.2	7.0	12.4	12.1	8.1	7.8
	RATIO	0.534	0.793	0.981	0.904	0.916	0.724	0.957	0.957	0.985	0.950
MILFORD-002 (60)	TSP	106	89	86	85	76	75	74	73	71	70
	DATE	5/ 1/85	4/19/85	9/ 4/85	12/ 9/85	10/10/85	2/24/85	4/25/85	5/13/85	3/ 8/85	1/19/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	250	270	240	210	320	230	220	240
NEWARK	VEL (MPH)	3.2	8.4	11.8	4.9	13.0	10.4	5.4	10.7	11.1	8.5
	SPD (MPH)	9.6	11.4	12.5	5.8	13.7	11.2	8.9	11.8	12.1	10.1
	RATIO	0.335	0.735	0.944	0.848	0.955	0.924	0.604	0.909	0.921	0.841
METEOROLOGICAL SITE	DIR (DEG)	10	340	240	330	230	190	200	180	240	240
BRADLEY	VEL (MPH)	5.4	3.2	5.3	2.8	5.0	8.2	2.3	7.3	4.9	5.0
	SPD (MPH)	7.5	4.5	8.3	3.7	9.1	8.6	6.5	9.1	8.1	5.5
	RATIO	0.717	0.717	0.635	0.759	0.553	0.949	0.359	0.807	0.606	0.911

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	280	180	260	270	240	240	230	200	240	260
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.7	5.6	9.3	8.6	3.3	7.4	10.7	9.6
	SPD (MPH)	8.6	7.2	9.8	5.9	9.5	8.6	5.3	8.1	10.8	11.1
	RATIO	0.341	0.438	0.992	0.945	0.978	0.997	0.620	0.916	0.996	0.864
METEOROLOGICAL SITE	DIR (DEG)	290	300	250	280	250	260	250	220	270	260
WORCESTER	VEL (MPH)	9.5	5.6	11.6	5.7	9.6	13.6	11.0	8.4	19.6	5.3
	SPD (MPH)	11.9	10.5	12.1	6.3	10.1	16.0	11.5	9.5	20.4	7.3
	RATIO	0.793	0.534	0.957	0.904	0.955	0.851	0.955	0.886	0.958	0.726
MORRIS-001 (60)	TSP	66	50	49	48	47	46	45	45	44	43
	DATE	5/13/85	9/ 4/85	3/20/85	5/31/85	6/18/85	5/ 1/85	4/19/85	8/ 5/85	6/24/85	7/ 6/85
METEOROLOGICAL SITE	DIR (DEG)	230	250	250	190	230	300	260	190	240	200
NEWARK	VEL (MPH)	10.7	11.8	9.5	9.9	9.1	3.2	8.4	5.8	8.7	7.6
	SPD (MPH)	11.8	12.5	13.9	10.2	10.2	9.6	11.4	7.6	9.8	8.3
	RATIO	0.909	0.944	0.678	0.969	0.894	0.335	0.735	0.759	0.889	0.913
METEOROLOGICAL SITE	DIR (DEG)	180	240	290	190	190	10	340	180	220	180
BRADLEY	VEL (MPH)	7.3	5.3	6.8	9.9	8.1	5.4	3.2	4.4	5.3	6.9
	SPD (MPH)	9.1	8.3	10.1	10.1	8.2	7.5	4.5	4.5	8.8	7.0
	RATIO	0.807	0.635	0.674	0.989	0.989	0.717	0.717	0.984	0.606	0.981
METEOROLOGICAL SITE	DIR (DEG)	200	260	270	190	220	280	180	200	230	190
BRIDGEPORT	VEL (MPH)	7.4	9.7	7.6	7.2	6.7	2.9	3.1	6.6	6.3	6.7
	SPD (MPH)	8.1	9.8	10.2	7.5	7.0	8.6	7.2	7.3	8.3	7.0
	RATIO	0.916	0.992	0.740	0.967	0.946	0.341	0.438	0.896	0.756	0.957
METEOROLOGICAL SITE	DIR (DEG)	220	250	280	200	210	290	300	230	230	210
WORCESTER	VEL (MPH)	8.4	11.6	14.0	13.8	7.4	9.5	5.6	5.7	8.0	8.3
	SPD (MPH)	9.5	12.1	15.2	13.9	7.8	11.9	10.5	6.5	9.9	8.6
	RATIO	0.886	0.957	0.916	0.988	0.950	0.793	0.534	0.879	0.802	0.966
NAUGATUCK-001 (60)	TSP	105	96	81	79	76	75	74	74	74	74
	DATE	5/ 1/85	1/31/85	4/19/85	5/13/85	3/ 8/85	12/27/85	10/10/85	5/31/85	1/ 7/85	7/24/85
METEOROLOGICAL SITE	DIR (DEG)	300	30	260	230	220	220	240	190	40	150
NEWARK	VEL (MPH)	3.2	7.1	8.4	10.7	11.1	12.6	13.0	9.9	2.8	3.8
	SPD (MPH)	9.6	7.5	11.4	11.8	12.1	13.2	13.7	10.2	6.6	9.2
	RATIO	0.335	0.950	0.735	0.909	0.921	0.952	0.955	0.969	0.417	0.413
METEOROLOGICAL SITE	DIR (DEG)	10	10	340	180	240	210	230	190	10	220
BRADLEY	VEL (MPH)	5.4	5.1	3.2	7.3	4.9	8.2	5.0	9.9	6.8	4.1
	SPD (MPH)	7.5	5.3	4.5	9.1	8.1	9.2	9.1	10.1	7.5	5.0
	RATIO	0.717	0.966	0.717	0.807	0.606	0.893	0.553	0.989	0.910	0.806
METEOROLOGICAL SITE	DIR (DEG)	280	40	180	200	240	240	240	190	40	190
BRIDGEPORT	VEL (MPH)	2.9	10.5	3.1	7.4	10.7	14.6	9.3	7.2	9.6	4.2
	SPD (MPH)	8.6	10.8	7.2	8.1	10.8	14.8	9.5	7.5	11.1	5.9
	RATIO	0.341	0.974	0.438	0.916	0.996	0.988	0.978	0.967	0.870	0.717
METEOROLOGICAL SITE	DIR (DEG)	290	60	300	220	270	220	250	200	70	210
WORCESTER	VEL (MPH)	9.5	4.0	5.6	8.4	19.6	11.8	9.6	13.8	7.9	3.6
	SPD (MPH)	11.9	5.2	10.5	9.5	20.4	12.4	10.1	13.9	8.1	7.2
	RATIO	0.793	0.763	0.534	0.886	0.958	0.957	0.955	0.988	0.985	0.498

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
NEW BRITAIN-007 (59)	TSP	76	70	67	65	63	62	59	59	59	53
	DATE	4/19/85	3/20/85	5/ 1/85	5/13/85	1/ 7/85	12/22/85	12/28/85	2/24/85	9/ 4/85	10/10/85
METEOROLOGICAL SITE	DIR (DEG)	260	250	300	230	40	230	260	210	250	240
NEWARK	VEL (MPH)	8.4	9.5	3.2	10.7	2.8	8.9	10.5	10.4	11.8	13.0
	SPD (MPH)	11.4	13.9	9.6	11.8	6.6	10.1	11.1	11.2	12.5	13.7
	RATIO	0.735	0.678	0.335	0.909	0.417	0.887	0.949	0.924	0.944	0.955
METEOROLOGICAL SITE	DIR (DEG)	340	290	10	180	10	210	270	190	240	230
BRADLEY	VEL (MPH)	3.2	6.8	5.4	7.3	6.8	4.9	8.2	8.2	5.3	5.0
	SPD (MPH)	4.5	10.1	7.5	9.1	7.5	5.9	11.1	8.6	8.3	9.1
	RATIO	0.717	0.674	0.717	0.807	0.910	0.831	0.744	0.949	0.635	0.553
METEOROLOGICAL SITE	DIR (DEG)	180	270	280	200	40	240	270	240	260	240
BRIDGEPORT	VEL (MPH)	3.1	7.6	2.9	7.4	9.6	10.9	14.2	8.6	9.7	9.3
	SPD (MPH)	7.2	10.2	8.6	8.1	11.1	11.4	14.4	8.6	9.8	9.5
	RATIO	0.438	0.740	0.341	0.916	0.870	0.959	0.991	0.997	0.992	0.978
METEOROLOGICAL SITE	DIR (DEG)	300	280	290	220	70	240	240	260	250	250
WORCESTER	VEL (MPH)	5.6	14.0	9.5	8.4	7.9	9.1	10.4	13.6	11.6	9.6
	SPD (MPH)	10.5	15.2	11.9	9.5	8.1	10.9	11.1	16.0	12.1	10.1
	RATIO	0.534	0.916	0.793	0.886	0.985	0.830	0.937	0.851	0.957	0.955
NEW BRITAIN-008 (59)	TSP	79	72	68	67	65	62	61	60	58	57
	DATE	9/ 4/85	5/ 1/85	4/19/85	5/13/85	2/24/85	12/27/85	3/20/85	12/21/85	10/10/85	5/25/85
METEOROLOGICAL SITE	DIR (DEG)	250	300	260	230	210	220	250	300	240	120
NEWARK	VEL (MPH)	11.8	3.2	8.4	10.7	10.4	12.6	9.5	7.9	13.0	3.3
	SPD (MPH)	12.5	9.6	11.4	11.8	11.2	13.2	13.9	8.6	13.7	7.5
	RATIO	0.944	0.335	0.735	0.909	0.924	0.952	0.678	0.914	0.955	0.438
METEOROLOGICAL SITE	DIR (DEG)	240	10	340	180	190	210	290	330	230	170
BRADLEY	VEL (MPH)	5.3	5.4	3.2	7.3	8.2	8.2	6.8	4.7	5.0	1.9
	SPD (MPH)	8.3	7.5	4.5	9.1	8.6	9.2	10.1	6.5	9.1	4.6
	RATIO	0.635	0.717	0.717	0.807	0.949	0.893	0.674	0.731	0.553	0.407
METEOROLOGICAL SITE	DIR (DEG)	260	280	180	200	240	240	270	310	240	110
BRIDGEPORT	VEL (MPH)	9.7	2.9	3.1	7.4	8.6	14.6	7.6	8.0	9.3	3.9
	SPD (MPH)	9.8	8.6	7.2	8.1	8.6	14.8	10.2	9.2	9.5	4.7
	RATIO	0.992	0.341	0.438	0.916	0.997	0.988	0.740	0.865	0.978	0.828
METEOROLOGICAL SITE	DIR (DEG)	250	290	300	220	260	220	280	310	250	210
WORCESTER	VEL (MPH)	11.6	9.5	5.6	8.4	13.6	11.8	14.0	5.1	9.6	7.7
	SPD (MPH)	12.1	11.9	10.5	9.5	16.0	12.4	15.2	7.0	10.1	8.9
	RATIO	0.957	0.793	0.534	0.886	0.851	0.957	0.916	0.724	0.955	0.861
NEW BRITAIN-009 (56)	TSP	69	68	66	66	55	54	54	54	53	52
	DATE	5/ 1/85	9/ 4/85	4/19/85	5/13/85	12/21/85	12/27/85	6/18/85	10/10/85	1/ 7/85	2/24/85
METEOROLOGICAL SITE	DIR (DEG)	300	250	260	230	300	220	230	240	40	210
NEWARK	VEL (MPH)	3.2	11.8	8.4	10.7	7.9	12.6	9.1	13.0	2.8	10.4
	SPD (MPH)	9.6	12.5	11.4	11.8	8.6	13.2	10.2	13.7	6.6	11.2
	RATIO	0.335	0.944	0.735	0.909	0.914	0.952	0.894	0.955	0.417	0.924
METEOROLOGICAL SITE	DIR (DEG)	10	240	340	180	330	210	190	230	10	190
BRADLEY	VEL (MPH)	5.4	5.3	3.2	7.3	4.7	8.2	8.1	5.0	6.8	8.2
	SPD (MPH)	7.5	8.3	4.5	9.1	6.5	9.2	8.2	9.1	7.5	8.6
	RATIO	0.717	0.635	0.717	0.807	0.731	0.893	0.989	0.553	0.910	0.949

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	280	260	180	200	310	240	220	240	40	240
BRIDGEPORT	VEL (MPH)	2.9	9.7	3.1	7.4	8.0	14.6	6.7	9.3	9.6	8.6
	SPD (MPH)	8.6	9.8	7.2	8.1	9.2	14.8	7.0	9.5	11.1	8.6
	RATIO	0.341	0.992	0.438	0.916	0.865	0.988	0.946	0.978	0.870	0.997
METEOROLOGICAL SITE	DIR (DEG)	290	250	300	220	310	220	210	250	70	260
WORCESTER	VEL (MPH)	9.5	11.6	5.6	8.4	5.1	11.8	7.4	9.6	7.9	13.6
	SPD (MPH)	11.9	12.1	10.5	9.5	7.0	12.4	7.8	10.1	8.1	16.0
	RATIO	0.793	0.957	0.534	0.886	0.724	0.957	0.950	0.955	0.985	0.851
NEW HAVEN-002 (51)	TSP	126	121	93	79	77	77	75	75	75	68
	DATE	5/ 1/85	7/30/85	1/31/85	1/ 7/85	1/13/85	9/ 5/85	1/19/85	10/10/85	2/18/85	2/24/85
METEOROLOGICAL SITE	DIR (DEG)	300	290	30	40	260	250	240	240	260	210
NEWARK	VEL (MPH)	3.2	6.0	7.1	2.8	12.7	9.0	8.5	13.0	10.0	10.4
	SPD (MPH)	9.6	9.9	7.5	6.6	13.4	10.2	10.1	13.7	11.8	11.2
	RATIO	0.335	0.609	0.950	0.417	0.947	0.884	0.841	0.955	0.847	0.924
METEOROLOGICAL SITE	DIR (DEG)	10	290	10	10	280	250	240	230	270	190
BRADLEY	VEL (MPH)	5.4	4.4	5.1	6.8	4.0	1.3	5.0	5.0	8.8	8.2
	SPD (MPH)	7.5	6.0	5.3	7.5	6.2	3.6	5.5	9.1	10.1	8.6
	RATIO	0.717	0.723	0.966	0.910	0.645	0.349	0.911	0.553	0.871	0.949
METEOROLOGICAL SITE	DIR (DEG)	280	260	40	40	260	250	260	240	270	240
BRIDGEPORT	VEL (MPH)	2.9	6.3	10.5	9.6	9.9	6.0	9.6	9.3	10.4	8.6
	SPD (MPH)	8.6	7.9	10.8	11.1	10.2	7.0	11.1	9.5	10.6	8.6
	RATIO	0.341	0.792	0.974	0.870	0.973	0.854	0.864	0.978	0.981	0.997
METEOROLOGICAL SITE	DIR (DEG)	290	280	60	70	310	270	260	250	290	260
WORCESTER	VEL (MPH)	9.5	5.0	4.0	7.9	9.8	7.9	5.3	9.6	16.9	13.6
	SPD (MPH)	11.9	7.5	5.2	8.1	10.6	8.3	7.3	10.1	17.3	16.0
	RATIO	0.793	0.674	0.763	0.985	0.925	0.945	0.726	0.955	0.981	0.851
NEW HAVEN-013 (55)	TSP	99	99	75	74	74	68	67	67	66	65
	DATE	5/ 1/85	4/19/85	10/10/85	9/ 4/85	1/ 7/85	2/24/85	5/13/85	3/ 8/85	1/31/85	1/19/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	240	250	40	210	230	220	30	240
NEWARK	VEL (MPH)	3.2	8.4	13.0	11.8	2.8	10.4	10.7	11.1	7.1	8.5
	SPD (MPH)	9.6	11.4	13.7	12.5	6.6	11.2	11.8	12.1	7.5	10.1
	RATIO	0.335	0.735	0.955	0.944	0.417	0.924	0.909	0.921	0.950	0.841
METEOROLOGICAL SITE	DIR (DEG)	10	340	230	240	10	190	180	240	10	240
BRADLEY	VEL (MPH)	5.4	3.2	5.0	5.3	6.8	8.2	7.3	4.9	5.1	5.0
	SPD (MPH)	7.5	4.5	9.1	8.3	7.5	8.6	9.1	8.1	5.3	5.5
	RATIO	0.717	0.717	0.553	0.635	0.910	0.949	0.807	0.606	0.966	0.911
METEOROLOGICAL SITE	DIR (DEG)	280	180	240	260	40	240	200	240	40	260
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.3	9.7	9.6	8.6	7.4	10.7	10.5	9.6
	SPD (MPH)	8.6	7.2	9.5	9.8	11.1	8.6	8.1	10.8	10.8	11.1
	RATIO	0.341	0.438	0.978	0.992	0.870	0.997	0.916	0.996	0.974	0.864
METEOROLOGICAL SITE	DIR (DEG)	290	300	250	250	70	260	220	270	60	260
WORCESTER	VEL (MPH)	9.5	5.6	9.6	11.6	7.9	13.6	8.4	19.6	4.0	5.3
	SPD (MPH)	11.9	10.5	10.1	12.1	8.1	16.0	9.5	20.4	5.2	7.3
	RATIO	0.793	0.534	0.955	0.957	0.985	0.851	0.886	0.958	0.763	0.726

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
NORWALK-001 (50)	TSP	98	91	88	72	71	65	64	64	64	63
	DATE	5/13/85	5/ 1/85	12/ 9/85	4/19/85	4/25/85	2/24/85	10/10/85	2/18/85	6/18/85	3/20/85
METEOROLOGICAL SITE	DIR (DEG)	230	300	270	260	320	210	240	260	230	250
NEWARK	VEL (MPH)	10.7	3.2	4.9	8.4	5.4	10.4	13.0	10.0	9.1	9.5
	SPD (MPH)	11.8	9.6	5.8	11.4	8.9	11.2	13.7	11.8	10.2	13.9
	RATIO	0.909	0.335	0.848	0.735	0.604	0.924	0.955	0.847	0.894	0.678
METEOROLOGICAL SITE	DIR (DEG)	180	10	330	340	200	190	230	270	190	290
BRADLEY	VEL (MPH)	7.3	5.4	2.8	3.2	2.3	8.2	5.0	8.8	8.1	6.8
	SPD (MPH)	9.1	7.5	3.7	4.5	6.5	8.6	9.1	10.1	8.2	10.1
	RATIO	0.807	0.717	0.759	0.717	0.359	0.949	0.553	0.871	0.989	0.674
METEOROLOGICAL SITE	DIR (DEG)	200	280	270	180	230	240	240	270	220	270
BRIDGEPORT	VEL (MPH)	7.4	2.9	5.6	3.1	3.3	8.6	9.3	10.4	6.7	7.6
	SPD (MPH)	8.1	8.6	5.9	7.2	5.3	8.6	9.5	10.6	7.0	10.2
	RATIO	0.916	0.341	0.945	0.438	0.620	0.997	0.978	0.981	0.946	0.740
METEOROLOGICAL SITE	DIR (DEG)	220	290	280	300	250	260	250	290	210	280
WORCESTER	VEL (MPH)	8.4	9.5	5.7	5.6	11.0	13.6	9.6	16.9	7.4	14.0
	SPD (MPH)	9.5	11.9	6.3	10.5	11.5	16.0	10.1	17.3	7.8	15.2
	RATIO	0.886	0.793	0.904	0.534	0.955	0.851	0.955	0.981	0.950	0.916
NORWALK-005 (57)	TSP	111	95	90	82	82	77	77	76	74	73
	DATE	5/ 1/85	1/ 7/85	5/31/85	9/ 4/85	4/19/85	3/ 8/85	5/13/85	12/ 9/85	12/27/85	10/10/85
METEOROLOGICAL SITE	DIR (DEG)	300	40	190	250	260	220	230	270	220	240
NEWARK	VEL (MPH)	3.2	2.8	9.9	11.8	8.4	11.1	10.7	4.9	12.6	13.0
	SPD (MPH)	9.6	6.6	10.2	12.5	11.4	12.1	11.8	5.8	13.2	13.7
	RATIO	0.335	0.417	0.969	0.944	0.735	0.921	0.909	0.848	0.952	0.955
METEOROLOGICAL SITE	DIR (DEG)	10	10	190	240	340	240	180	330	210	230
BRADLEY	VEL (MPH)	5.4	6.8	9.9	5.3	3.2	4.9	7.3	2.8	8.2	5.0
	SPD (MPH)	7.5	7.5	10.1	8.3	4.5	8.1	9.1	3.7	9.2	9.1
	RATIO	0.717	0.910	0.989	0.635	0.717	0.606	0.807	0.759	0.893	0.553
METEOROLOGICAL SITE	DIR (DEG)	280	40	190	260	180	240	200	270	240	240
BRIDGEPORT	VEL (MPH)	2.9	9.6	7.2	9.7	3.1	10.7	7.4	5.6	14.6	9.3
	SPD (MPH)	8.6	11.1	7.5	9.8	7.2	10.8	8.1	5.9	14.8	9.5
	RATIO	0.341	0.870	0.967	0.992	0.438	0.996	0.916	0.945	0.988	0.978
METEOROLOGICAL SITE	DIR (DEG)	290	70	200	250	300	270	220	280	220	250
WORCESTER	VEL (MPH)	9.5	7.9	13.8	11.6	5.6	19.6	8.4	5.7	11.8	9.6
	SPD (MPH)	11.9	8.1	13.9	12.1	10.5	20.4	9.5	6.3	12.4	10.1
	RATIO	0.793	0.985	0.988	0.957	0.534	0.958	0.886	0.904	0.957	0.955
NORWALK-012 (59)	TSP	108	72	71	71	69	67	62	61	61	61
	DATE	5/ 1/85	2/18/85	4/19/85	5/13/85	9/ 4/85	1/ 7/85	1/19/85	12/27/85	6/30/85	10/10/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	260	230	250	40	240	220	100	240
NEWARK	VEL (MPH)	3.2	10.0	8.4	10.7	11.8	2.8	8.5	12.6	3.7	13.0
	SPD (MPH)	9.6	11.8	11.4	11.8	12.5	6.6	10.1	13.2	7.0	13.7
	RATIO	0.335	0.847	0.735	0.909	0.944	0.417	0.841	0.952	0.530	0.955
METEOROLOGICAL SITE	DIR (DEG)	10	270	340	180	240	10	240	210	30	230
BRADLEY	VEL (MPH)	5.4	8.8	3.2	7.3	5.3	6.8	5.0	8.2	1.9	5.0
	SPD (MPH)	7.5	10.1	4.5	9.1	8.3	7.5	5.5	9.2	4.5	9.1
	RATIO	0.717	0.871	0.717	0.807	0.635	0.910	0.911	0.893	0.415	0.553

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	280	270	180	200	260	40	260	240	110	240
BRIDGEPORT	VEL (MPH)	2.9	10.4	3.1	7.4	9.7	9.6	9.6	14.6	3.5	9.3
	SPD (MPH)	8.6	10.6	7.2	8.1	9.8	11.1	11.1	14.8	4.9	9.5
	RATIO	0.341	0.981	0.438	0.916	0.992	0.870	0.864	0.988	0.720	0.978
METEOROLOGICAL SITE	DIR (DEG)	290	290	300	220	250	70	260	220	360	250
WORCESTER	VEL (MPH)	9.5	16.9	5.6	8.4	11.6	7.9	5.3	11.8	2.2	9.6
	SPD (MPH)	11.9	17.3	10.5	9.5	12.1	8.1	7.3	12.4	5.9	10.1
	RATIO	0.793	0.981	0.534	0.886	0.957	0.985	0.726	0.957	0.374	0.955
NORWICH-002 (54)	TSP	159	91	89	86	74	72	72	68	64	63
	DATE	9/ 4/85	1/31/85	12/27/85	4/19/85	5/13/85	12/21/85	1/25/85	2/18/85	9/10/85	12/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	250	30	220	260	230	300	250	260	350	270
NEWARK	VEL (MPH)	11.8	7.1	12.6	8.4	10.7	7.9	6.9	10.0	2.0	4.9
	SPD (MPH)	12.5	7.5	13.2	11.4	11.8	8.6	9.6	11.8	7.5	5.8
	RATIO	0.944	0.950	0.952	0.735	0.909	0.914	0.719	0.847	0.261	0.848
METEOROLOGICAL SITE	DIR (DEG)	240	10	210	340	180	330	240	270	10	330
BRADLEY	VEL (MPH)	5.3	5.1	8.2	3.2	7.3	4.7	4.0	8.8	4.1	2.8
	SPD (MPH)	8.3	5.3	9.2	4.5	9.1	6.5	5.9	10.1	4.6	3.7
	RATIO	0.635	0.966	0.893	0.717	0.807	0.731	0.676	0.871	0.897	0.759
METEOROLOGICAL SITE	DIR (DEG)	260	40	240	180	200	310	250	270	90	270
BRIDGEPORT	VEL (MPH)	9.7	10.5	14.6	3.1	7.4	8.0	8.1	10.4	2.1	5.6
	SPD (MPH)	9.8	10.8	14.8	7.2	8.1	9.2	8.9	10.6	4.5	5.9
	RATIO	0.992	0.974	0.988	0.438	0.916	0.865	0.907	0.981	0.481	0.945
METEOROLOGICAL SITE	DIR (DEG)	250	60	220	300	220	310	280	290	30	280
WORCESTER	VEL (MPH)	11.6	4.0	11.8	5.6	8.4	5.1	5.9	16.9	4.1	5.7
	SPD (MPH)	12.1	5.2	12.4	10.5	9.5	7.0	7.3	17.3	4.2	6.3
	RATIO	0.957	0.763	0.957	0.534	0.886	0.724	0.802	0.981	0.985	0.904
STAMFORD-001 (56)	TSP	165	142	119	110	110	108	100	91	91	87
	DATE	5/ 1/85	4/19/85	6/ 6/85	7/30/85	5/13/85	12/27/85	6/18/85	10/10/85	3/20/85	12/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	330	290	230	220	230	240	250	270
NEWARK	VEL (MPH)	3.2	8.4	11.5	6.0	10.7	12.6	9.1	13.0	9.5	4.9
	SPD (MPH)	9.6	11.4	11.6	9.9	11.8	13.2	10.2	13.7	13.9	5.8
	RATIO	0.335	0.735	0.987	0.609	0.909	0.952	0.894	0.955	0.678	0.848
METEOROLOGICAL SITE	DIR (DEG)	10	340	340	290	180	210	190	230	290	330
BRADLEY	VEL (MPH)	5.4	3.2	8.9	4.4	7.3	8.2	8.1	5.0	6.8	2.8
	SPD (MPH)	7.5	4.5	9.5	6.0	9.1	9.2	8.2	9.1	10.1	3.7
	RATIO	0.717	0.717	0.940	0.723	0.807	0.893	0.989	0.553	0.674	0.759
METEOROLOGICAL SITE	DIR (DEG)	280	180	340	260	200	240	220	240	270	270
BRIDGEPORT	VEL (MPH)	2.9	3.1	10.5	6.3	7.4	14.6	6.7	9.3	7.6	5.6
	SPD (MPH)	8.6	7.2	10.8	7.9	8.1	14.8	7.0	9.5	10.2	5.9
	RATIO	0.341	0.438	0.972	0.792	0.916	0.988	0.946	0.978	0.740	0.945
METEOROLOGICAL SITE	DIR (DEG)	290	300	330	280	220	220	210	250	280	280
WORCESTER	VEL (MPH)	9.5	5.6	9.0	5.0	8.4	11.8	7.4	9.6	14.0	5.7
	SPD (MPH)	11.9	10.5	9.5	7.5	9.5	12.4	7.8	10.1	15.2	6.3
	RATIO	0.793	0.534	0.945	0.674	0.886	0.957	0.950	0.955	0.916	0.904

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
STAMFORD-007 (58)	TSP	111	102	94	82	82	73	73	68	67	63
	DATE	5/ 1/85	10/28/85	4/19/85	5/13/85	9/ 4/85	12/ 9/85	10/10/85	8/29/85	1/ 7/85	7/30/85
METEOROLOGICAL SITE	DIR (DEG)	300	330	260	230	250	270	240	340	40	290
NEWARK	VEL (MPH)	3.2	17.5	8.4	10.7	11.8	4.9	13.0	4.6	2.8	6.0
	SPD (MPH)	9.6	17.8	11.4	11.8	12.5	5.8	13.7	7.6	6.6	9.9
	RATIO	0.335	0.980	0.735	0.909	0.944	0.848	0.955	0.606	0.417	0.609
METEOROLOGICAL SITE	DIR (DEG)	10	320	340	180	240	330	230	340	10	290
BRADLEY	VEL (MPH)	5.4	12.3	3.2	7.3	5.3	2.8	5.0	3.6	6.8	4.4
	SPD (MPH)	7.5	13.1	4.5	9.1	8.3	3.7	9.1	5.6	7.5	6.0
	RATIO	0.717	0.944	0.717	0.807	0.635	0.759	0.553	0.649	0.910	0.723
METEOROLOGICAL SITE	DIR (DEG)	280	330	180	200	260	270	240	340	40	260
BRIDGEPORT	VEL (MPH)	2.9	13.8	3.1	7.4	9.7	5.6	9.3	2.7	9.6	6.3
	SPD (MPH)	8.6	13.9	7.2	8.1	9.8	5.9	9.5	6.0	11.1	7.9
	RATIO	0.341	0.993	0.438	0.916	0.992	0.945	0.978	0.450	0.870	0.792
METEOROLOGICAL SITE	DIR (DEG)	290	300	300	220	250	280	250	300	70	280
WORCESTER	VEL (MPH)	9.5	13.2	5.6	8.4	11.6	5.7	9.6	5.9	7.9	5.0
	SPD (MPH)	11.9	14.2	10.5	9.5	12.1	6.3	10.1	6.5	8.1	7.5
	RATIO	0.793	0.929	0.534	0.886	0.957	0.904	0.955	0.915	0.985	0.674
STAMFORD-021 (53)	TSP	115	84	78	73	73	64	63	62	61	61
	DATE	5/ 1/85	4/19/85	1/ 7/85	10/10/85	12/ 9/85	6/18/85	6/12/85	10/22/85	12/27/85	1/31/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	40	240	270	230	290	60	220	30
NEWARK	VEL (MPH)	3.2	8.4	2.8	13.0	4.9	9.1	6.3	6.8	12.6	7.1
	SPD (MPH)	9.6	11.4	6.6	13.7	5.8	10.2	12.2	10.4	13.2	7.5
	RATIO	0.335	0.735	0.417	0.955	0.848	0.894	0.517	0.660	0.952	0.950
METEOROLOGICAL SITE	DIR (DEG)	10	340	10	230	330	190	20	200	210	10
BRADLEY	VEL (MPH)	5.4	3.2	6.8	5.0	2.8	8.1	5.0	1.8	8.2	5.1
	SPD (MPH)	7.5	4.5	7.5	9.1	3.7	8.2	5.3	2.2	9.2	5.3
	RATIO	0.717	0.717	0.910	0.553	0.759	0.989	0.940	0.844	0.893	0.966
METEOROLOGICAL SITE	DIR (DEG)	280	180	40	240	270	220	40	80	240	40
BRIDGEPORT	VEL (MPH)	2.9	3.1	9.6	9.3	5.6	6.7	6.1	4.9	14.6	10.5
	SPD (MPH)	8.6	7.2	11.1	9.5	5.9	7.0	8.1	5.8	14.8	10.8
	RATIO	0.341	0.438	0.870	0.978	0.945	0.946	0.761	0.857	0.988	0.974
METEOROLOGICAL SITE	DIR (DEG)	290	300	70	250	280	210	40	260	220	60
WORCESTER	VEL (MPH)	9.5	5.6	7.9	9.6	5.7	7.4	7.3	7.2	11.8	4.0
	SPD (MPH)	11.9	10.5	8.1	10.1	6.3	7.8	9.1	7.3	12.4	5.2
	RATIO	0.793	0.534	0.985	0.955	0.904	0.950	0.806	0.986	0.957	0.763
STRATFORD-005 (58)	TSP	114	90	89	83	83	83	81	81	78	76
	DATE	5/ 1/85	3/ 8/85	4/19/85	9/ 4/85	1/25/85	3/20/85	5/13/85	2/24/85	4/25/85	12/27/85
METEOROLOGICAL SITE	DIR (DEG)	300	220	260	250	250	250	230	210	320	220
NEWARK	VEL (MPH)	3.2	11.1	8.4	11.8	6.9	9.5	10.7	10.4	5.4	12.6
	SPD (MPH)	9.6	12.1	11.4	12.5	9.6	13.9	11.8	11.2	8.9	13.2
	RATIO	0.335	0.921	0.735	0.944	0.719	0.678	0.909	0.924	0.604	0.952
METEOROLOGICAL SITE	DIR (DEG)	10	240	340	240	240	290	180	190	200	210
BRADLEY	VEL (MPH)	5.4	4.9	3.2	5.3	4.0	6.8	7.3	8.2	2.3	8.2
	SPD (MPH)	7.5	8.1	4.5	8.3	5.9	10.1	9.1	8.6	6.5	9.2
	RATIO	0.717	0.606	0.717	0.635	0.676	0.674	0.807	0.949	0.359	0.893

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	280	240	180	260	250	270	200	240	230	240
BRIDGEPORT	VEL (MPH)	2.9	10.7	3.1	9.7	8.1	7.6	7.4	8.6	3.3	14.6
	SPD (MPH)	8.6	10.8	7.2	9.8	8.9	10.2	8.1	8.6	5.3	14.8
	RATIO	0.341	0.996	0.438	0.992	0.907	0.740	0.916	0.997	0.620	0.988
METEOROLOGICAL SITE	DIR (DEG)	290	270	300	250	280	280	220	260	250	220
WORCESTER	VEL (MPH)	9.5	19.6	5.6	11.6	5.9	14.0	8.4	13.6	11.0	11.8
	SPD (MPH)	11.9	20.4	10.5	12.1	7.3	15.2	9.5	16.0	11.5	12.4
	RATIO	0.793	0.958	0.534	0.957	0.802	0.916	0.886	0.851	0.955	0.957
TORRINGTON-001 (60)	TSP	94	84	83	78	69	67	66	65	61	58
	DATE	1/31/85	2/18/85	2/24/85	3/20/85	5/13/85	3/ 8/85	3/ 2/85	12/27/85	9/ 4/85	4/19/85
METEOROLOGICAL SITE	DIR (DEG)	30	260	210	250	230	220	300	220	250	260
NEWARK	VEL (MPH)	7.1	10.0	10.4	9.5	10.7	11.1	13.3	12.6	11.8	8.4
	SPD (MPH)	7.5	11.8	11.2	13.9	11.8	12.1	15.4	13.2	12.5	11.4
	RATIO	0.950	0.847	0.924	0.678	0.909	0.921	0.864	0.952	0.944	0.735
METEOROLOGICAL SITE	DIR (DEG)	10	270	190	290	180	240	310	210	240	340
BRADLEY	VEL (MPH)	5.1	8.8	8.2	6.8	7.3	4.9	9.0	8.2	5.3	3.2
	SPD (MPH)	5.3	10.1	8.6	10.1	9.1	8.1	10.9	9.2	8.3	4.5
	RATIO	0.966	0.871	0.949	0.674	0.807	0.606	0.823	0.893	0.635	0.717
METEOROLOGICAL SITE	DIR (DEG)	40	270	240	270	200	240	300	240	260	180
BRIDGEPORT	VEL (MPH)	10.5	10.4	8.6	7.6	7.4	10.7	9.6	14.6	9.7	3.1
	SPD (MPH)	10.8	10.6	8.6	10.2	8.1	10.8	10.8	14.8	9.8	7.2
	RATIO	0.974	0.981	0.997	0.740	0.916	0.996	0.894	0.988	0.992	0.438
METEOROLOGICAL SITE	DIR (DEG)	60	290	260	280	220	270	300	220	250	300
WORCESTER	VEL (MPH)	4.0	16.9	13.6	14.0	8.4	19.6	14.3	11.8	11.6	5.6
	SPD (MPH)	5.2	17.3	16.0	15.2	9.5	20.4	16.2	12.4	12.1	10.5
	RATIO	0.763	0.981	0.851	0.916	0.886	0.958	0.880	0.957	0.957	0.534
VOLUNTOWN-001 (56)	TSP	57	56	54	51	40	38	35	34	33	30
	DATE	5/ 1/85	4/19/85	5/31/85	9/ 4/85	6/18/85	3/20/85	7/30/85	7/ 6/85	5/19/85	6/12/85
METEOROLOGICAL SITE	DIR (DEG)	300	260	190	250	230	250	290	200	280	290
NEWARK	VEL (MPH)	3.2	8.4	9.9	11.8	9.1	9.5	6.0	7.6	12.0	6.3
	SPD (MPH)	9.6	11.4	10.2	12.5	10.2	13.9	9.9	8.3	14.2	12.2
	RATIO	0.335	0.735	0.969	0.944	0.894	0.678	0.609	0.913	0.842	0.517
METEOROLOGICAL SITE	DIR (DEG)	10	340	190	240	190	290	290	180	290	20
BRADLEY	VEL (MPH)	5.4	3.2	9.9	5.3	8.1	6.8	4.4	6.9	7.8	5.0
	SPD (MPH)	7.5	4.5	10.1	8.3	8.2	10.1	6.0	7.0	9.3	5.3
	RATIO	0.717	0.717	0.989	0.635	0.989	0.674	0.723	0.981	0.832	0.940
METEOROLOGICAL SITE	DIR (DEG)	280	180	190	260	220	270	260	190	300	40
BRIDGEPORT	VEL (MPH)	2.9	3.1	7.2	9.7	6.7	7.6	6.3	6.7	9.9	6.1
	SPD (MPH)	8.6	7.2	7.5	9.8	7.0	10.2	7.9	7.0	10.2	8.1
	RATIO	0.341	0.438	0.967	0.992	0.946	0.740	0.792	0.957	0.972	0.761
METEOROLOGICAL SITE	DIR (DEG)	290	300	200	250	210	280	280	210	270	40
WORCESTER	VEL (MPH)	9.5	5.6	13.8	11.6	7.4	14.0	5.0	8.3	10.9	7.3
	SPD (MPH)	11.9	10.5	13.9	12.1	7.8	15.2	7.5	8.6	11.5	9.1
	RATIO	0.793	0.534	0.988	0.957	0.950	0.916	0.674	0.966	0.946	0.806

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
WALLINGFORD-001 (59)	TSP	97	90	89	89	84	82	78	76	75	74
	DATE	3/ 8/85	12/27/85	12/ 9/85	1/25/85	4/19/85	2/18/85	1/13/85	5/ 1/85	1/31/85	1/ 7/85
METEOROLOGICAL SITE	DIR (DEG)	220	220	270	250	260	260	260	300	30	40
NEWARK	VEL (MPH)	11.1	12.6	4.9	6.9	8.4	10.0	12.7	3.2	7.1	2.8
	SPD (MPH)	12.1	13.2	5.8	9.6	11.4	11.8	13.4	9.6	7.5	6.6
	RATIO	0.921	0.952	0.848	0.719	0.735	0.847	0.947	0.335	0.950	0.417
METEOROLOGICAL SITE	DIR (DEG)	240	210	330	240	340	270	280	10	10	10
BRADLEY	VEL (MPH)	4.9	8.2	2.8	4.0	3.2	8.8	4.0	5.4	5.1	6.8
	SPD (MPH)	8.1	9.2	3.7	5.9	4.5	10.1	6.2	7.5	5.3	7.5
	RATIO	0.606	0.893	0.759	0.676	0.717	0.871	0.645	0.717	0.966	0.910
METEOROLOGICAL SITE	DIR (DEG)	240	240	270	250	180	270	260	280	40	40
BRIDGEPORT	VEL (MPH)	10.7	14.6	5.6	8.1	3.1	10.4	9.9	2.9	10.5	9.6
	SPD (MPH)	10.8	14.8	5.9	8.9	7.2	10.6	10.2	8.6	10.8	11.1
	RATIO	0.996	0.988	0.945	0.907	0.438	0.981	0.973	0.341	0.974	0.870
METEOROLOGICAL SITE	DIR (DEG)	270	220	280	280	300	290	310	290	60	70
WORCESTER	VEL (MPH)	19.6	11.8	5.7	5.9	5.6	16.9	9.8	9.5	4.0	7.9
	SPD (MPH)	20.4	12.4	6.3	7.3	10.5	17.3	10.6	11.9	5.2	8.1
	RATIO	0.958	0.957	0.904	0.802	0.534	0.981	0.925	0.793	0.763	0.985
WATERBURY-005 (56)	TSP	82	82	80	79	78	76	76	76	72	71
	DATE	1/19/85	5/ 1/85	2/24/85	12/27/85	3/ 2/85	1/31/85	4/19/85	12/ 9/85	10/10/85	12/21/85
METEOROLOGICAL SITE	DIR (DEG)	240	300	210	220	300	30	260	270	240	300
NEWARK	VEL (MPH)	8.5	3.2	10.4	12.6	13.3	7.1	8.4	4.9	13.0	7.9
	SPD (MPH)	10.1	9.6	11.2	13.2	15.4	7.5	11.4	5.8	13.7	8.6
	RATIO	0.841	0.335	0.924	0.952	0.864	0.950	0.735	0.848	0.955	0.914
METEOROLOGICAL SITE	DIR (DEG)	240	10	190	210	310	10	340	330	230	330
BRADLEY	VEL (MPH)	5.0	5.4	8.2	8.2	9.0	5.1	3.2	2.8	5.0	4.7
	SPD (MPH)	5.5	7.5	8.6	9.2	10.9	5.3	4.5	3.7	9.1	6.5
	RATIO	0.911	0.717	0.949	0.893	0.823	0.966	0.717	0.759	0.553	0.731
METEOROLOGICAL SITE	DIR (DEG)	260	280	240	240	300	40	180	270	240	310
BRIDGEPORT	VEL (MPH)	9.6	2.9	8.6	14.6	9.6	10.5	3.1	5.6	9.3	8.0
	SPD (MPH)	11.1	8.6	8.6	14.8	10.8	10.8	7.2	5.9	9.5	9.2
	RATIO	0.864	0.341	0.997	0.988	0.894	0.974	0.438	0.945	0.978	0.865
METEOROLOGICAL SITE	DIR (DEG)	260	290	260	220	300	60	300	280	250	310
WORCESTER	VEL (MPH)	5.3	9.5	13.6	11.8	14.3	4.0	5.6	5.7	9.6	5.1
	SPD (MPH)	7.3	11.9	16.0	12.4	16.2	5.2	10.5	6.3	10.1	7.0
	RATIO	0.726	0.793	0.851	0.957	0.880	0.763	0.534	0.904	0.955	0.724
WATERBURY-006 (59)	TSP	78	72	68	65	61	60	58	57	56	52
	DATE	5/13/85	5/ 1/85	4/19/85	1/ 7/85	9/ 4/85	1/19/85	2/24/85	12/27/85	3/20/85	3/ 2/85
METEOROLOGICAL SITE	DIR (DEG)	230	300	260	40	250	240	210	220	250	300
NEWARK	VEL (MPH)	10.7	3.2	8.4	2.8	11.8	8.5	10.4	12.6	9.5	13.3
	SPD (MPH)	11.8	9.6	11.4	6.6	12.5	10.1	11.2	13.2	13.9	15.4
	RATIO	0.909	0.335	0.735	0.417	0.944	0.841	0.924	0.952	0.678	0.864
METEOROLOGICAL SITE	DIR (DEG)	180	10	340	10	240	240	190	210	290	310
BRADLEY	VEL (MPH)	7.3	5.4	3.2	6.8	5.3	5.0	8.2	8.2	6.8	9.0
	SPD (MPH)	9.1	7.5	4.5	7.5	8.3	5.5	8.6	9.2	10.1	10.9
	RATIO	0.807	0.717	0.717	0.910	0.635	0.911	0.949	0.893	0.674	0.823

SW = 185/400 = 46.2   NE = 46/400 = 11.5

NW = 122/400 = 30.5   SE = 3/400 = 0.7

TABLE 11, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE TSP DAYS WITH WIND DATA

UNITS : MICROGRAMS PER CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	200	280	180	40	260	260	240	240	270	300
	VEL (MPH)	7.4	2.9	3.1	9.6	9.7	9.6	8.6	14.6	7.6	9.6
	SPD (MPH)	8.1	8.6	7.2	11.1	9.8	11.1	8.6	14.8	10.2	10.8
	RATIO	0.916	0.341	0.438	0.870	0.992	0.864	0.997	0.988	0.740	0.894
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	220	290	300	70	250	260	260	220	280	300
	VEL (MPH)	8.4	9.5	5.6	7.9	11.6	5.3	13.6	11.8	14.0	14.3
	SPD (MPH)	9.5	11.9	10.5	8.1	12.1	7.3	16.0	12.4	15.2	16.2
	RATIO	0.886	0.793	0.534	0.985	0.957	0.726	0.851	0.957	0.916	0.880
WATERBURY-007 (60)	TSP	130	113	106	103	99	89	87	85	78	77
	DATE	12/27/85	2/18/85	2/24/85	3/ 8/85	3/ 2/85	5/13/85	3/20/85	1/31/85	5/ 1/85	4/19/85
METEOROLOGICAL SITE NEWARK	DIR (DEG)	220	260	210	220	300	230	250	30	300	260
	VEL (MPH)	12.6	10.0	10.4	11.1	13.3	10.7	9.5	7.1	3.2	8.4
	SPD (MPH)	13.2	11.8	11.2	12.1	15.4	11.8	13.9	7.5	9.6	11.4
	RATIO	0.952	0.847	0.924	0.921	0.864	0.909	0.678	0.950	0.335	0.735
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	210	270	190	240	310	180	290	10	10	340
	VEL (MPH)	8.2	8.8	8.2	4.9	9.0	7.3	6.8	5.1	5.4	3.2
	SPD (MPH)	9.2	10.1	8.6	8.1	10.9	9.1	10.1	5.3	7.5	4.5
	RATIO	0.893	0.871	0.949	0.606	0.823	0.807	0.674	0.966	0.717	0.717
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	240	270	240	240	300	200	270	40	280	180
	VEL (MPH)	14.6	10.4	8.6	10.7	9.6	7.4	7.6	10.5	2.9	3.1
	SPD (MPH)	14.8	10.6	8.6	10.8	10.8	8.1	10.2	10.8	8.6	7.2
	RATIO	0.988	0.981	0.997	0.996	0.894	0.916	0.740	0.974	0.341	0.438
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	220	290	260	270	300	220	280	60	290	300
	VEL (MPH)	11.8	16.9	13.6	19.6	14.3	8.4	14.0	4.0	9.5	5.6
	SPD (MPH)	12.4	17.3	16.0	20.4	16.2	9.5	15.2	5.2	11.9	10.5
	RATIO	0.957	0.981	0.851	0.958	0.880	0.886	0.916	0.763	0.793	0.534
WILLIMANTIC-002 (60)	TSP	106	101	89	82	67	67	64	63	62	59
	DATE	2/18/85	3/ 2/85	1/31/85	12/27/85	5/ 1/85	3/20/85	2/24/85	3/ 8/85	12/ 9/85	9/ 4/85
METEOROLOGICAL SITE NEWARK	DIR (DEG)	260	300	30	220	300	250	210	220	270	250
	VEL (MPH)	10.0	13.3	7.1	12.6	3.2	9.5	10.4	11.1	4.9	11.8
	SPD (MPH)	11.8	15.4	7.5	13.2	9.6	13.9	11.2	12.1	5.8	12.5
	RATIO	0.847	0.864	0.950	0.952	0.335	0.678	0.924	0.921	0.848	0.944
METEOROLOGICAL SITE BRADLEY	DIR (DEG)	270	310	10	210	10	290	190	240	330	240
	VEL (MPH)	8.8	9.0	5.1	8.2	5.4	6.8	8.2	4.9	2.8	5.3
	SPD (MPH)	10.1	10.9	5.3	9.2	7.5	10.1	8.6	8.1	3.7	8.3
	RATIO	0.871	0.823	0.966	0.893	0.717	0.674	0.949	0.606	0.759	0.635
METEOROLOGICAL SITE BRIDGEPORT	DIR (DEG)	270	300	40	240	280	270	240	240	270	260
	VEL (MPH)	10.4	9.6	10.5	14.6	2.9	7.6	8.6	10.7	5.6	9.7
	SPD (MPH)	10.6	10.8	10.8	14.8	8.6	10.2	8.6	10.8	5.9	9.8
	RATIO	0.981	0.894	0.974	0.988	0.341	0.740	0.997	0.996	0.945	0.992
METEOROLOGICAL SITE WORCESTER	DIR (DEG)	290	300	60	220	290	280	260	270	280	250
	VEL (MPH)	16.9	14.3	4.0	11.8	9.5	14.0	13.6	19.6	5.7	11.6
	SPD (MPH)	17.3	16.2	5.2	12.4	11.9	15.2	16.0	20.4	6.3	12.1
	RATIO	0.981	0.880	0.763	0.957	0.793	0.916	0.851	0.958	0.904	0.957

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 1985 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 1985.

DISCUSSION OF DATA

Monitoring Network - Eighteen continuous SO_2 monitors were used to record data in fifteen towns during 1985 (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
- Preston 002
- Stamford 025
- Stamford 123
- Waterbury 123

All of these sites telemetered the data to the central computer in Hartford on a real-time basis.

Precision and Accuracy - 565 precision checks were made on SO_2 monitors in 1985, yielding 95% probability limits ranging from -11% to +7%. 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, -5% to +3%; medium, -5% to +4%; and high, -6% to +2%.

Annual Averages - SO_2 levels were below the primary annual standard of 80 µg/m³ at all sites in 1985 (see Table 12). The annual average SO_2 levels increased at ~~7~~ of the ~~15~~ monitoring sites that had adequate data in both 1984 and 1985 to produce valid annual averages. Five sites showed decreases from 1984 to 1985. New Haven ~~123~~ experienced the highest increase of ~~9~~ µg/m³. ~~Hartford 123 showed~~ the largest annual average decrease of 8 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 Stamford 025 site.~~ The data for these sites indicate that there were no violations of the primary SO_2 standard in Connecticut. For example, a statistical prediction of one day exceeding the primary 24-hour standard (365 µg/m³) at Bridgeport 012 indicates that a slight increase in SO_2 emissions there might jeopardize the attainment of this standard. Two days over the standard are required for the standard to be violated.

24-Hour Averages - Table 14 presents the 1st and 2nd high calendar day average concentrations recorded at each monitoring site. In 1985 no sites recorded SO_2 levels in excess of the 24-hour primary standard of 365 µg/m³. Second high calendar day average concentrations decreased at ~~14~~ of the ~~15~~ SO_2 monitoring sites that had a sufficient distribution and quantity of data in both 1984 and 1985. The decreases ranged from 12 µg/m³ at Preston 002 to 110 µg/m³ at Hartford 123.

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 28 µg/m³ at Norwalk 013.

3-Hour Averages - Table 16 presents the 1st and 2nd 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 1985. Of the ~~15~~ sites that had a sufficient distribution and quantity of data in both 1984 and 1985, all but ~~3~~ had lower 2nd high concentrations in 1985. ~~Six of these decreases were greater than 100 µg/m³.~~ Of the ~~3~~ sites with higher 2nd high concentrations in 1985, the largest increase was 57 µg/m³ at New Haven 017.

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 1985. 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., 43.3%) of the highest SO_2 days occur with winds out of the southwest quadrant and most of these days have 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 1985 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 sixteen such days). A close look at these sixteen days revealed three important points. First, fifteen of the sixteen days occurred during the winter months. This can be attributed to more fuel being burned during the cold weather. Second, eight of the sixteen days had persistent southwest winds for that calendar day. Third, two other days had persistent southwest 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, in this region, southwest winds occur relatively often 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").

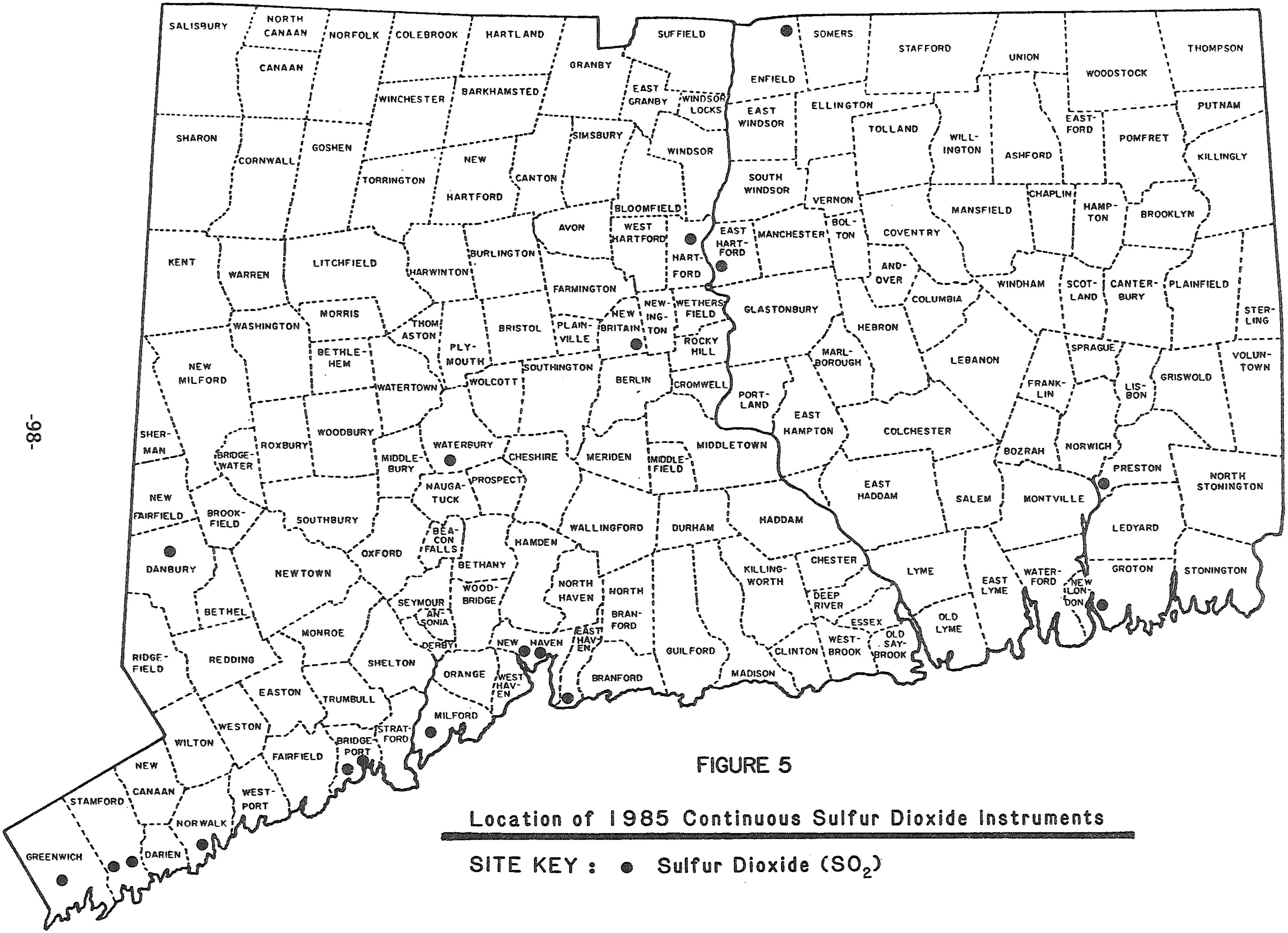


FIGURE 5

Location of 1985 Continuous Sulfur Dioxide Instruments

SITE KEY : ● Sulfur Dioxide (SO_2)

TABLE 12

1985 ANNUAL ARITHMETIC AVERAGES OF SULFUR DIOXIDE AT SITES WITH CONTINUOUS MONITORS

(PRIMARY STANDARD: 80 µg/m^3)

TOWN	SITE NAME	ANNUAL AVG* (µg/m^3)
Bridgeport-012	Edison School	36
Bridgeport-123	Hallett Street	32
Danbury-123	Western CT State College	20
East Hartford-005	Fire House - Engine Co. #5	22**
East Haven-003	Animal Shelter	25
Enfield-005	Department of Corrections	14
Greenwich-017	Greenwich Point Park	15
Groton-007	Fire Headquarters	21
Hartford-123	State Office Building	23
Milford-002	Devon Community Center	30
New Britain-011	Armory	23
New Haven-017	Lombard St. Fire House	~~29~~ 37
New Haven-123	State Street	44
Norwalk-013	Ludlow School	24
Preston-002	Norwich State Hospital	14
Stamford-025	Recreation Center	28**
Stamford-123	Health Department	29
Waterbury-123	Bank Street	23

* 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

1983-1985 SO2 ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

TOWN NAME	SITE	YEAR	SAMPLES	ARI. MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	STD DEVIATION	LOGNORMAL DISTRIBUTION PREDICTED DAYS OVER 365 UG/M3	LOGNORMAL DISTRIBUTION MEASURED 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	123	1983	359	33.3	33	34	22.834		
BRIDGEPORT	123	1984	358	31.8	31	32	26.948		
BRIDGEPORT	123	1985	~~358~~ 355	~~31.5~~ 30.8	~~31~~ 30	~~32~~ 31	~~26.101~~ 24.961		
DANBURY	123	1983	356	16.9	17	17	13.031		
DANBURY	123	1984	358	17.5	17	18	18.635		
DANBURY	123	1985	292	20.0	19	21	17.747		
EAST HARTFORD	005	1984	309	27.4	26	28	24.298		
EAST HARTFORD	005	1985	306*	19.8	19	21	20.695		
EAST HAVEN	003	1984	341	20.1	20	21	19.700		
EAST HAVEN	003	1985	332	24.8	24	26	23.377		
ENFIELD	005	1983	61*	23.1	18	28	20.895		
ENFIELD	005	1984	349	13.9	14	14	16.871		
ENFIELD	005	1985	345	12.7	12	13	13.625		
GREENWICH	017	1983	333	15.5	15	16	11.659		
GREENWICH	017	1984	345	16.9	16	17	17.251		
GREENWICH	017	1985	357	14.4	14	15	12.452		
GROTON	007	1983	79*	24.2	21	27	13.835		
GROTON	007	1984	334	20.6	20	21	16.210		
GROTON	007	1985	354	21.3	21	22	13.955		
HARTFORD	123	1983	360	32.4	32	33	22.793		
HARTFORD	123	1984	360	31.4	31	32	31.425		
HARTFORD	123	1985	361	22.8	23	23	22.298		

* 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 STANDARD DEVIATION HAVE UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 13, CONTINUED

1983-1985 SO2 ANNUAL AVERAGES AND STATISTICAL PROJECTIONS

TOWN NAME	SITE	YEAR	SAMPLES	ARI. MEAN	95-PCT-LIMITS LOWER	95-PCT-LIMITS UPPER	STD DEVIATION	LOGNORMAL DISTRIBUTION PREDICTED DAYS OVER 365 UG/M3	MEASURED DAYS OVER 365 UG/M3
MILFORD	002	1983	342	34.8	34	36	27.169		
MILFORD	002	1984	341	33.9	33	35	34.191	1	
MILFORD	002	1985	349	29.3	29	30	27.498		
NEW BRITAIN	011	1984	227*	14.2	13	15	12.809		
NEW BRITAIN	011	1985	360	23.0	23	23	19.693		
NEW HAVEN	017	1984	330	24.6	24	25	22.161		
NEW HAVEN	017	1985	341	36.2	35	37	31.069		
NEW HAVEN	123	1983	363	30.7	30	31	24.284		
NEW HAVEN	123	1984	346	34.6	34	35	32.585		
NEW HAVEN	123	1985	357	44.3	44	45	36.297		
NORWALK	013	1984	266*	17.1	16	18	14.621	1	
NORWALK	013	1985	364	23.1	23	23	22.858		
PRESTON	002	1983	61*	13.9	12	16	7.016		
PRESTON	002	1984	345	10.9	11	11	9.527		
PRESTON	002	1985	349	13.0	13	13	10.803		
STAMFORD	025	1984	297*	23.0	22	24	16.563		
STAMFORD	025	1985	280*	28.5	27	30	21.965		
STAMFORD	123	1983	362	26.7	26	27	18.916		
STAMFORD	123	1984	343	31.9	31	32	21.563		
STAMFORD	123	1985	353	28.6	28	29	22.817		
WATERBURY	007	1983	60*	34.0	27	41	29.103		
WATERBURY	007	1984	350	28.8	28	29	28.810		
WATERBURY	123	1983	351	18.9	19	19	14.291		
WATERBURY	123	1984	334	22.7	22	23	20.813		
WATERBURY	123	1985	351	23.0	23	23	19.482		

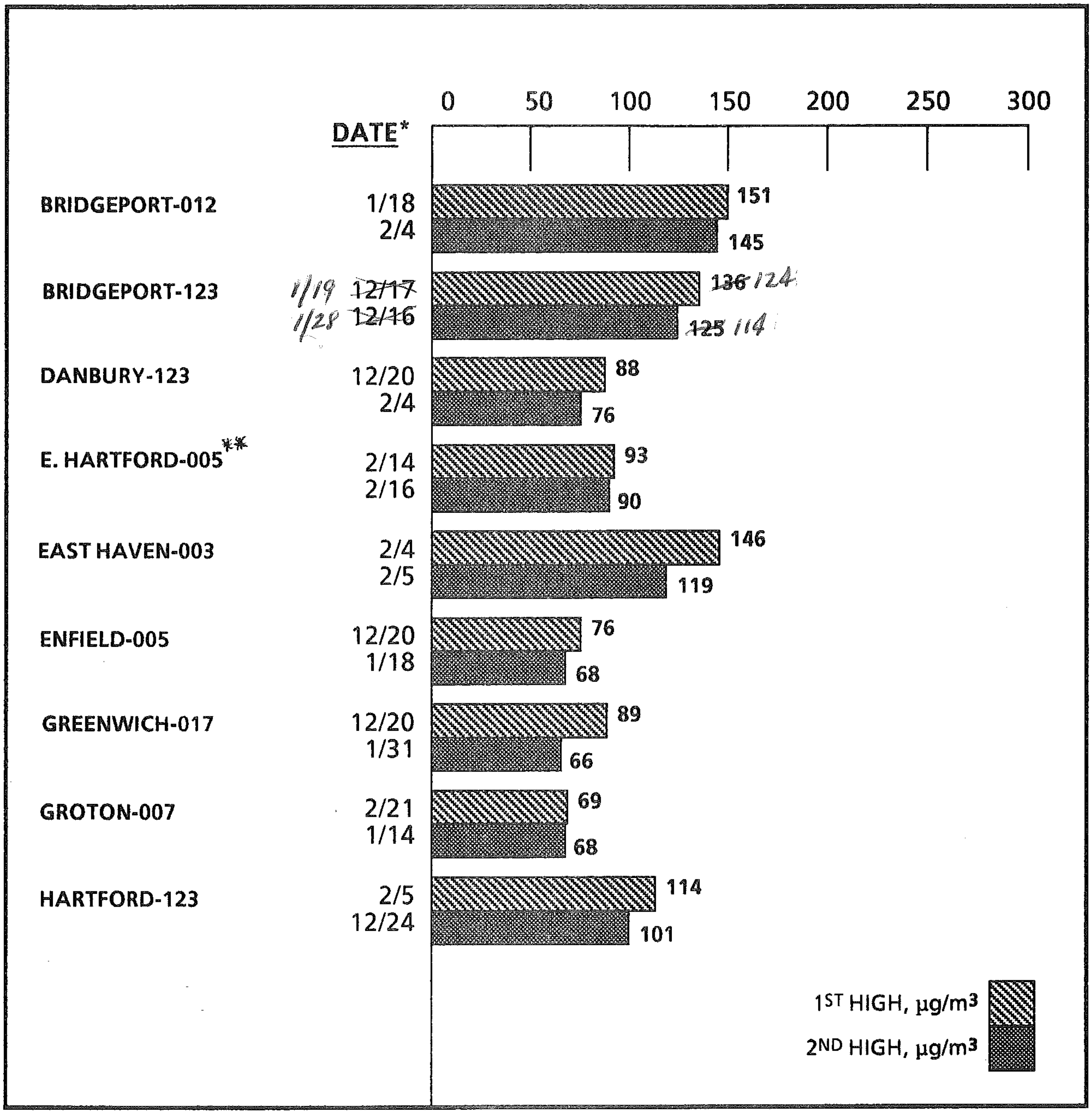
* SAMPLING NOT RANDOM OR OF INSUFFICIENT SIZE FOR REPRESENTATIVE ANNUAL STATISTICS.

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 STANDARD DEVIATION HAVE UNITS OF MICROGRAMS PER CUBIC METER.

TABLE 14

1985 MAXIMUM CALENDAR DAY AVERAGE SO2 CONCENTRATIONS



* Date is month/day of occurrence.

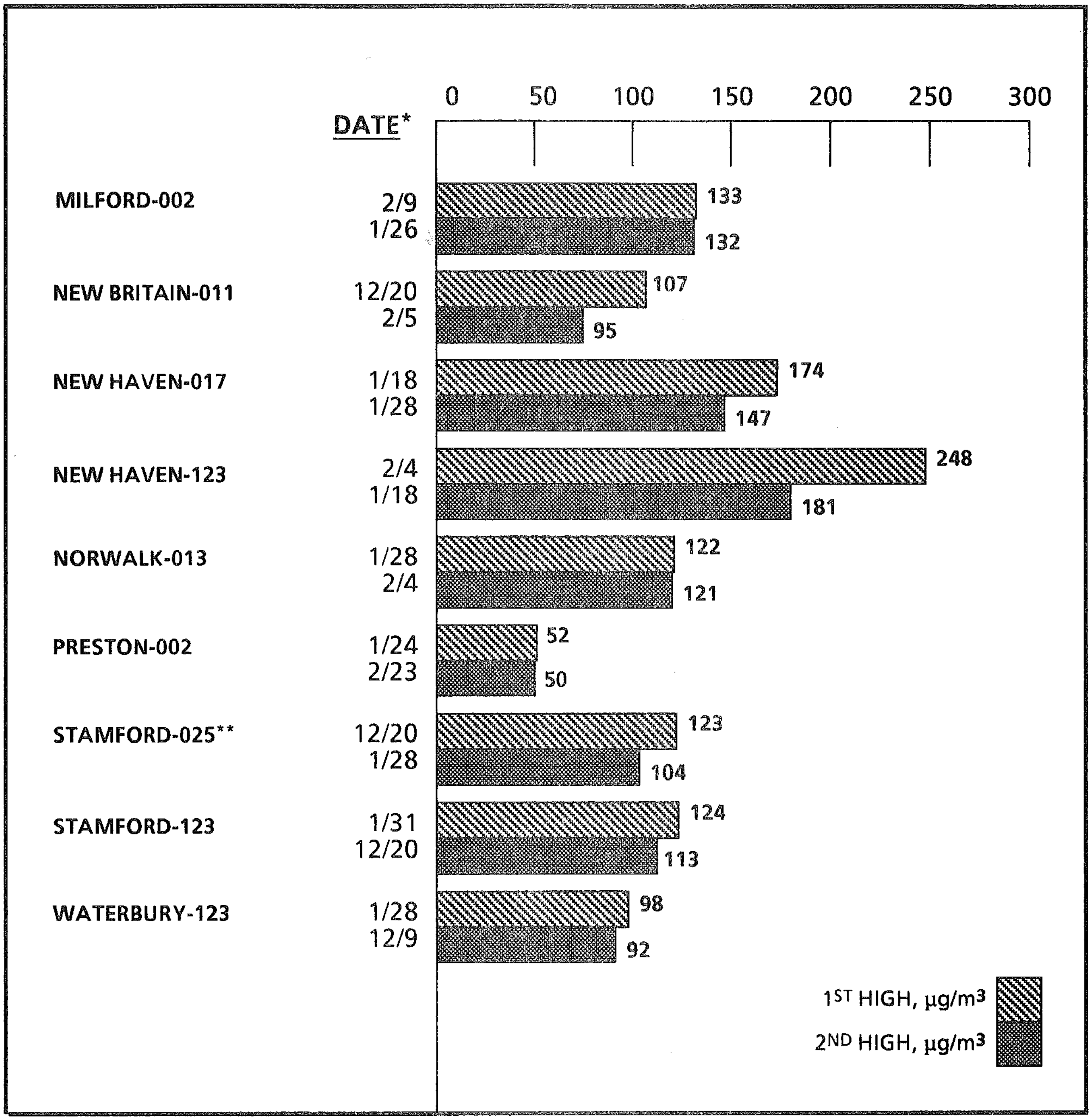
** Database for the site is deficient in number or distribution of observations.

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

Primary standard = 365 µg/m3.

TABLE 14, CONTINUED

1985 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.

Primary standard = 365 µg/m^3.

TABLE 15

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

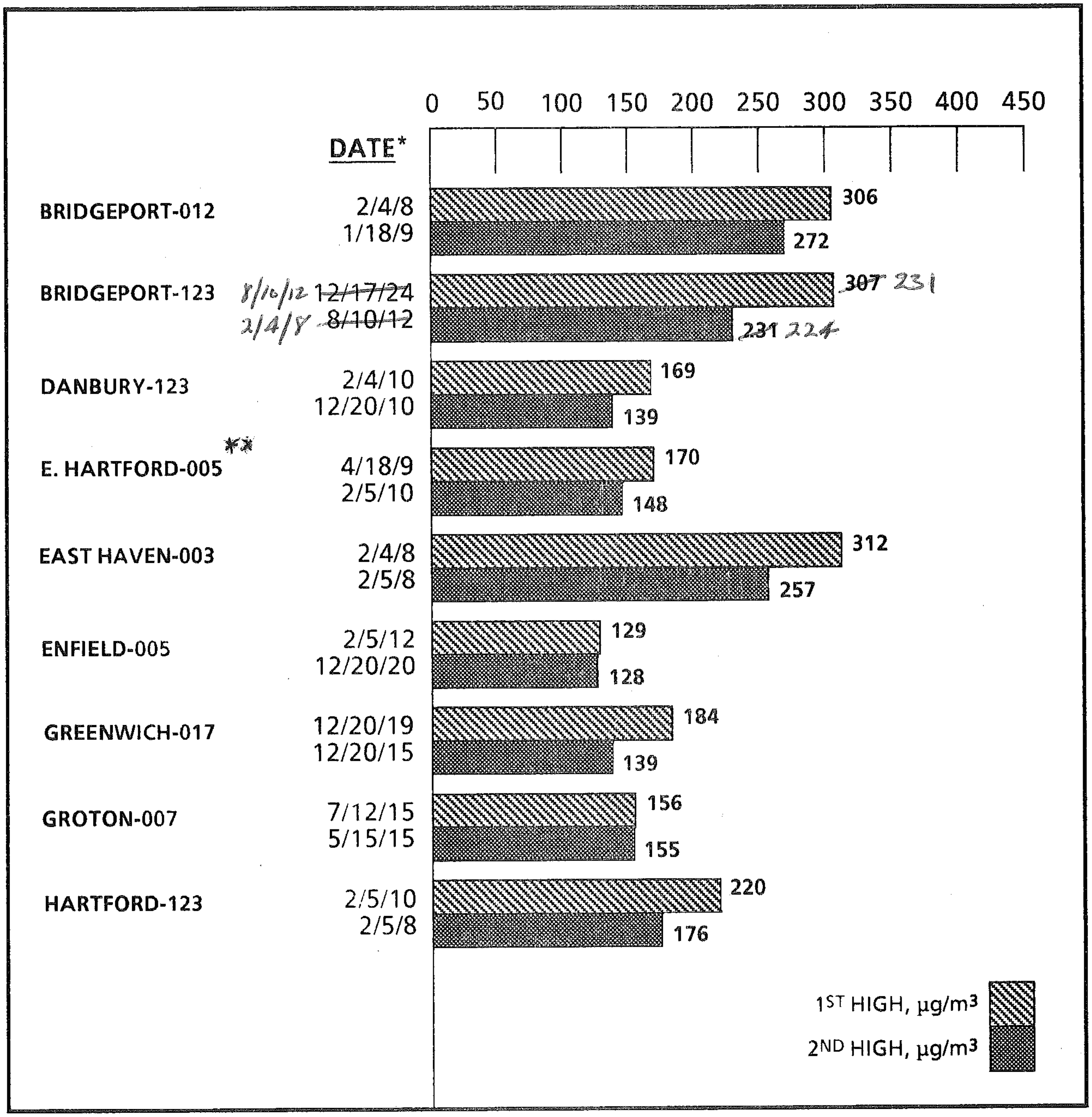
SITE	FIRST HIGH AVERAGE		SECOND HIGH AVERAGE	
	RUNNING 24-HOUR	CALENDAR DAY	RUNNING 24-HOUR	CALENDAR DAY
Bridgeport-012	159	151	154	145
Bridgeport-123	~~157~~ 141	~~136~~ 124	~~141~~ 130	~~125~~ 114
Danbury-123	93	88	89	76
E. Hartford-005**	99	93	98	90
East Haven-003	149	146	135	119
Enfield-005	85	76	76	68
Greenwich-017	92	89	67	66
Groton-007	76	69	74	68
Hartford-123	117	114	116	101
Milford-002	158	133	143	132
New Britain-011	108	107	103	95
New Haven-017	189	174	186	147
New Haven-123	259	248	214	181
Norwalk-013	150	122	128	121
Preston-002	59	52	56	50
Stamford-025**	134	123	126	104
Stamford-123	128	124	119	113
Waterbury-123	117	98	104	92

* Units are $\mu g/m^3$.

** The number or distribution of observations at the site is inadequate for the calculation of a valid annual average.

TABLE 16

1985 MAXIMUM 3-HOUR RUNNING AVERAGE SO2 CONCENTRATIONS



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

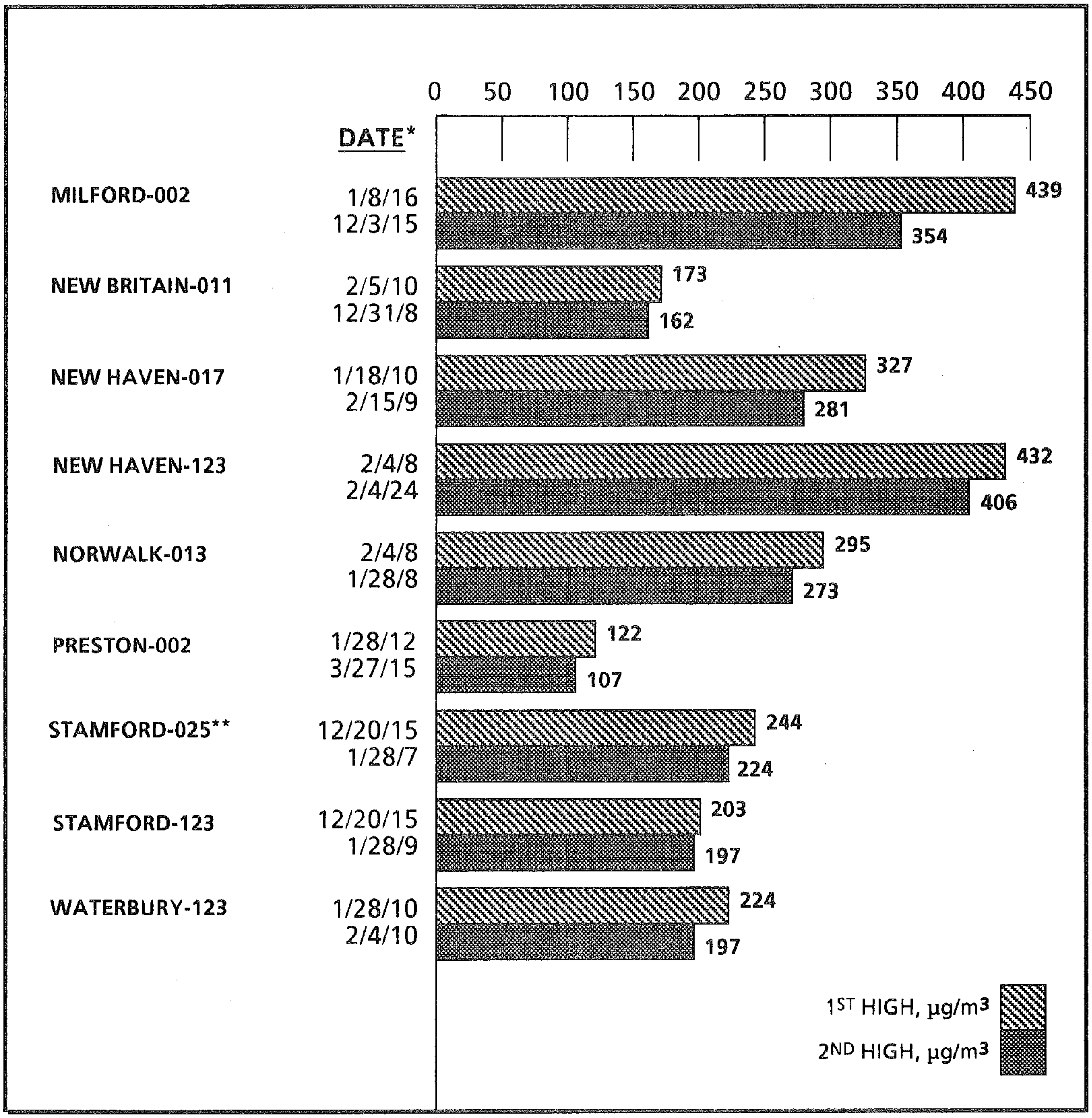
** Database for the site is deficient in number or distribution of observations.

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

Secondary standard = 1300 µg/m³.

TABLE 16, CONTINUED

1985 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.

Secondary standard = 1300 µg/m^3.

TABLE 17

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
BRIDGEPORT-012 (317)	SO2	151	145	136	130	127	125	124	123	119	117
	DATE	1/18/85	2/ 4/85	1/14/85	12/31/85	2/17/85	2/15/85	1/28/85	2/ 5/85	1/19/85	3/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	230	280	240	210	240	260	300	40	240	210
NEWARK	VEL (MPH)	3.8	7.4	8.0	9.5	11.6	9.4	6.8	7.9	8.5	10.7
	SPD (MPH)	5.2	8.2	8.8	10.2	12.5	9.9	9.3	8.9	10.1	11.8
	RATIO	0.735	0.907	0.911	0.930	0.930	0.946	0.723	0.884	0.841	0.912
METEOROLOGICAL SITE	DIR (DEG)	200	320	240	190	220	240	320	30	240	200
BRADLEY	VEL (MPH)	1.9	4.3	3.9	9.0	6.5	5.5	3.3	2.6	5.0	10.8
	SPD (MPH)	2.7	6.5	4.9	9.2	8.2	6.2	3.3	3.6	5.5	11.1
	RATIO	0.693	0.665	0.803	0.983	0.796	0.889	0.983	0.712	0.911	0.979
METEOROLOGICAL SITE	DIR (DEG)	210	250	250	210	240	260	300	60	260	220
BRIDGEPORT	VEL (MPH)	6.8	5.1	6.3	12.0	9.0	9.5	6.0	11.5	9.6	11.0
	SPD (MPH)	7.3	6.6	7.5	12.9	9.6	10.4	7.3	11.8	11.1	11.5
	RATIO	0.932	0.765	0.844	0.925	0.939	0.920	0.813	0.979	0.864	0.954
METEOROLOGICAL SITE	DIR (DEG)	300	290	270	210	260	260	300	90	260	260
WORCESTER	VEL (MPH)	7.3	7.1	6.9	15.5	12.3	8.2	9.5	0.8	5.3	17.6
	SPD (MPH)	8.2	7.8	8.1	15.5	12.7	8.5	10.1	5.9	7.3	17.8
	RATIO	0.891	0.921	0.857	0.996	0.969	0.971	0.945	0.138	0.726	0.989
BRIDGEPORT-123 (358) 355	SO2	136	125	124	114	111	105	104	104	100	97
	DATE	12/17/85	12/16/85	1/19/85	1/28/85	2/ 4/85	1/31/85	12/ 9/85	3/ 1/85	2/ 5/85	2/21/85
METEOROLOGICAL SITE	DIR (DEG)	270	240	240	300	280	30	270	210	40	160
NEWARK	VEL (MPH)	8.1	6.7	8.5	6.8	7.4	7.1	4.9	10.7	7.9	3.6
	SPD (MPH)	10.6	7.8	10.1	9.3	8.2	7.5	5.8	11.8	8.9	7.2
	RATIO	0.764	0.868	0.841	0.723	0.907	0.950	0.848	0.912	0.884	0.496
METEOROLOGICAL SITE	DIR (DEG)	270	200	240	320	320	10	330	200	30	190
BRADLEY	VEL (MPH)	8.2	6.4	5.0	3.3	4.3	5.1	2.8	10.8	2.6	3.3
	SPD (MPH)	11.6	7.8	5.5	3.3	6.5	5.3	3.7	11.1	3.6	4.6
	RATIO	0.707	0.828	0.911	0.983	0.665	0.966	0.759	0.979	0.712	0.711
METEOROLOGICAL SITE	DIR (DEG)	290	250	260	300	250	40	270	220	60	130
BRIDGEPORT	VEL (MPH)	9.5	13.4	9.6	6.0	5.1	10.5	5.6	11.0	11.5	2.5
	SPD (MPH)	10.1	13.7	11.1	7.3	6.6	10.8	5.9	11.5	11.8	4.6
	RATIO	0.945	0.980	0.864	0.813	0.765	0.974	0.945	0.954	0.979	0.551
METEOROLOGICAL SITE	DIR (DEG)	240	230	260	300	290	60	280	260	90	280
WORCESTER	VEL (MPH)	10.6	11.5	5.3	9.5	7.1	4.0	5.7	17.6	0.8	5.5
	SPD (MPH)	11.5	11.8	7.3	10.1	7.8	5.2	6.3	17.8	5.9	7.9
	RATIO	0.921	0.972	0.726	0.945	0.921	0.763	0.904	0.989	0.138	0.699
DANBURY-123 (292)	SO2	88	76	73	72	72	71	70	70	67	64
	DATE	12/20/85	2/ 4/85	12/29/85	2/ 5/85	1/28/85	12/23/85	12/21/85	12/ 9/85	2/21/85	1/17/85
METEOROLOGICAL SITE	DIR (DEG)	10	280	240	40	300	190	300	270	160	220
NEWARK	VEL (MPH)	4.6	7.4	4.2	7.9	6.8	6.4	7.9	4.9	3.6	6.4
	SPD (MPH)	5.9	8.2	6.3	8.9	9.3	7.0	8.6	5.8	7.2	8.1
	RATIO	0.786	0.907	0.661	0.884	0.723	0.909	0.914	0.848	0.496	0.789
METEOROLOGICAL SITE	DIR (DEG)	300	320	210	30	320	190	330	330	190	300
BRADLEY	VEL (MPH)	1.6	4.3	5.4	2.6	3.3	6.4	4.7	2.8	3.3	0.3
	SPD (MPH)	4.2	6.5	6.5	3.6	3.3	6.9	6.5	3.7	4.6	3.6
	RATIO	0.384	0.665	0.829	0.712	0.983	0.932	0.731	0.759	0.711	0.090

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TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	30	250	240	60	300	250	310	270	130	40
BRIDGEPORT	VEL (MPH)	5.2	5.1	6.5	11.5	6.0	9.2	8.0	5.6	2.5	2.1
	SPD (MPH)	5.8	6.6	7.8	11.8	7.3	9.5	9.2	5.9	4.6	5.6
	RATIO	0.900	0.765	0.831	0.979	0.813	0.972	0.865	0.945	0.551	0.366
METEOROLOGICAL SITE	DIR (DEG)	260	290	230	90	300	230	310	280	280	310
WORCESTER	VEL (MPH)	3.5	7.1	8.1	0.8	9.5	10.4	5.1	5.7	5.5	1.8
	SPD (MPH)	7.9	7.8	8.3	5.9	10.1	10.5	7.0	6.3	7.9	4.9
	RATIO	0.442	0.921	0.966	0.138	0.945	0.989	0.724	0.904	0.699	0.365
EAST HARTFORD-005 (306)	SO2	93	90	89	87	81	81	81	79	77	77
	DATE	2/14/85	2/16/85	2/ 5/85	2/ 9/85	12/20/85	12/24/85	2/ 1/85	3/11/85	1/31/85	2/17/85
METEOROLOGICAL SITE	DIR (DEG)	240	250	40	310	10	190	20	180	30	240
NEWARK	VEL (MPH)	12.4	10.7	7.9	22.4	4.6	2.5	10.7	4.2	7.1	11.6
	SPD (MPH)	13.1	11.5	8.9	22.9	5.9	3.2	10.8	6.5	7.5	12.5
	RATIO	0.945	0.930	0.884	0.982	0.786	0.789	0.996	0.655	0.950	0.930
METEOROLOGICAL SITE	DIR (DEG)	210	240	30	340	300	190	20	180	10	220
BRADLEY	VEL (MPH)	9.0	6.4	2.6	15.3	1.6	1.7	5.9	7.6	5.1	6.5
	SPD (MPH)	9.9	7.2	3.6	15.5	4.2	5.6	6.0	7.8	5.3	8.2
	RATIO	0.910	0.892	0.712	0.982	0.384	0.296	0.981	0.978	0.966	0.796
METEOROLOGICAL SITE	DIR (DEG)	240	240	60	320	30	140	20	110	40	240
BRIDGEPORT	VEL (MPH)	12.0	11.5	11.5	15.9	5.2	2.0	8.8	4.6	10.5	9.0
	SPD (MPH)	12.2	11.8	11.8	16.1	5.8	5.0	9.2	7.3	10.8	9.6
	RATIO	0.980	0.977	0.979	0.990	0.900	0.398	0.952	0.633	0.974	0.939
METEOROLOGICAL SITE	DIR (DEG)	250	270	90	340	260	190	60	240	60	260
WORCESTER	VEL (MPH)	12.3	9.3	0.8	18.8	3.5	5.6	5.0	9.0	4.0	12.3
	SPD (MPH)	12.4	9.6	5.9	19.0	7.9	6.8	5.2	10.8	5.2	12.7
	RATIO	0.991	0.968	0.138	0.990	0.442	0.833	0.974	0.834	0.763	0.969
EAST HAVEN-003 (332)	SO2	146	119	109	101	101	97	94	90	84	83
	DATE	2/ 4/85	2/ 5/85	12/ 9/85	1/28/85	1/14/85	12/20/85	1/31/85	1/18/85	12/23/85	12/ 5/85
METEOROLOGICAL SITE	DIR (DEG)	280	40	270	300	240	10	30	230	190	10
NEWARK	VEL (MPH)	7.4	7.9	4.9	6.8	8.0	4.6	7.1	3.8	6.4	4.5
	SPD (MPH)	8.2	8.9	5.8	9.3	8.8	5.9	7.5	5.2	7.0	5.6
	RATIO	0.907	0.884	0.848	0.723	0.911	0.786	0.950	0.735	0.909	0.805
METEOROLOGICAL SITE	DIR (DEG)	320	30	330	320	240	300	10	200	190	20
BRADLEY	VEL (MPH)	4.3	2.6	2.8	3.3	3.9	1.6	5.1	1.9	6.4	3.1
	SPD (MPH)	6.5	3.6	3.7	3.3	4.9	4.2	5.3	2.7	6.9	3.4
	RATIO	0.665	0.712	0.759	0.983	0.803	0.384	0.966	0.693	0.932	0.913
METEOROLOGICAL SITE	DIR (DEG)	250	60	270	300	250	30	40	210	250	40
BRIDGEPORT	VEL (MPH)	5.1	11.5	5.6	6.0	6.3	5.2	10.5	6.8	9.2	4.1
	SPD (MPH)	6.6	11.8	5.9	7.3	7.5	5.8	10.8	7.3	9.5	5.5
	RATIO	0.765	0.979	0.945	0.813	0.844	0.900	0.974	0.932	0.972	0.751
METEOROLOGICAL SITE	DIR (DEG)	290	90	280	300	270	260	60	300	230	350
WORCESTER	VEL (MPH)	7.1	0.8	5.7	9.5	6.9	3.5	4.0	7.3	10.4	4.5
	SPD (MPH)	7.8	5.9	6.3	10.1	8.1	7.9	5.2	8.2	10.5	5.9
	RATIO	0.921	0.138	0.904	0.945	0.857	0.442	0.763	0.891	0.989	0.759

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TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
ENFIELD-005 (345)	SO2	76	68	64	62	56	56	55	54	54	51
	DATE	12/20/85	1/18/85	12/24/85	2/ 5/85	12/21/85	12/23/85	2/14/85	12/29/85	1/14/85	12/22/85
METEOROLOGICAL SITE	DIR (DEG)	10	230	190	40	300	190	240	240	240	230
NEWARK	VEL (MPH)	4.6	3.8	2.5	7.9	7.9	6.4	12.4	4.2	8.0	8.9
	SPD (MPH)	5.9	5.2	3.2	8.9	8.6	7.0	13.1	6.3	8.8	10.1
	RATIO	0.786	0.735	0.789	0.884	0.914	0.909	0.945	0.661	0.911	0.887
METEOROLOGICAL SITE	DIR (DEG)	300	200	190	30	330	190	210	210	240	210
BRADLEY	VEL (MPH)	1.6	1.9	1.7	2.6	4.7	6.4	9.0	5.4	3.9	4.9
	SPD (MPH)	4.2	2.7	5.6	3.6	6.5	6.9	9.9	6.5	4.9	5.9
	RATIO	0.384	0.693	0.296	0.712	0.731	0.932	0.910	0.829	0.803	0.831
METEOROLOGICAL SITE	DIR (DEG)	30	210	140	60	310	250	240	240	250	240
BRIDGEPORT	VEL (MPH)	5.2	6.8	2.0	11.5	8.0	9.2	12.0	6.5	6.3	10.9
	SPD (MPH)	5.8	7.3	5.0	11.8	9.2	9.5	12.2	7.8	7.5	11.4
	RATIO	0.900	0.932	0.398	0.979	0.865	0.972	0.980	0.831	0.844	0.959
METEOROLOGICAL SITE	DIR (DEG)	260	300	190	90	310	230	250	230	270	240
WORCESTER	VEL (MPH)	3.5	7.3	5.6	0.8	5.1	10.4	12.3	8.1	6.9	9.1
	SPD (MPH)	7.9	8.2	6.8	5.9	7.0	10.5	12.4	8.3	8.1	10.9
	RATIO	0.442	0.891	0.833	0.138	0.724	0.989	0.991	0.966	0.857	0.830
GREENWICH-017 (357)	SO2	89	66	65	57	56	53	53	50	49	46
	DATE	12/20/85	1/31/85	1/14/85	2/ 5/85	12/ 9/85	12/ 5/85	12/11/85	12/23/85	1/24/85	1/ 7/85
METEOROLOGICAL SITE	DIR (DEG)	10	30	240	40	270	10	30	190	250	40
NEWARK	VEL (MPH)	4.6	7.1	8.0	7.9	4.9	4.5	1.3	6.4	12.0	2.8
	SPD (MPH)	5.9	7.5	8.8	8.9	5.8	5.6	5.0	7.0	12.7	6.6
	RATIO	0.786	0.950	0.911	0.884	0.848	0.805	0.260	0.909	0.947	0.417
METEOROLOGICAL SITE	DIR (DEG)	300	10	240	30	330	20	10	190	220	10
BRADLEY	VEL (MPH)	1.6	5.1	3.9	2.6	2.8	3.1	3.2	6.4	4.7	6.8
	SPD (MPH)	4.2	5.3	4.9	3.6	3.7	3.4	3.9	6.9	6.0	7.5
	RATIO	0.384	0.966	0.803	0.712	0.759	0.913	0.834	0.932	0.786	0.910
METEOROLOGICAL SITE	DIR (DEG)	30	40	250	60	270	40	50	250	250	40
BRIDGEPORT	VEL (MPH)	5.2	10.5	6.3	11.5	5.6	4.1	6.5	9.2	11.2	9.6
	SPD (MPH)	5.8	10.8	7.5	11.8	5.9	5.5	8.1	9.5	11.4	11.1
	RATIO	0.900	0.974	0.844	0.979	0.945	0.751	0.810	0.972	0.987	0.870
METEOROLOGICAL SITE	DIR (DEG)	260	60	270	90	280	350	340	230	290	70
WORCESTER	VEL (MPH)	3.5	4.0	6.9	0.8	5.7	4.5	0.5	10.4	11.9	7.9
	SPD (MPH)	7.9	5.2	8.1	5.9	6.3	5.9	5.0	10.5	12.1	8.1
	RATIO	0.442	0.763	0.857	0.138	0.904	0.759	0.093	0.989	0.982	0.985
GROTON-007 (354)	SO2	69	68	67	60	60	58	58	58	57	57
	DATE	2/21/85	1/14/85	1/28/85	1/ 4/85	2/ 5/85	2/16/85	12/21/85	2/15/85	11/24/85	2/14/85
METEOROLOGICAL SITE	DIR (DEG)	160	240	300	360	40	250	300	260	290	240
NEWARK	VEL (MPH)	3.6	8.0	6.8	7.2	7.9	10.7	7.9	9.4	8.1	12.4
	SPD (MPH)	7.2	8.8	9.3	8.1	8.9	11.5	8.6	9.9	10.6	13.1
	RATIO	0.496	0.911	0.723	0.896	0.884	0.930	0.914	0.946	0.759	0.945
METEOROLOGICAL SITE	DIR (DEG)	190	240	320	10	30	240	330	240	300	210
BRADLEY	VEL (MPH)	3.3	3.9	3.3	1.0	2.6	6.4	4.7	5.5	5.0	9.0
	SPD (MPH)	4.6	4.9	3.3	1.9	3.6	7.2	6.5	6.2	8.3	9.9
	RATIO	0.711	0.803	0.983	0.558	0.712	0.892	0.731	0.889	0.602	0.910

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TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	130	250	300	20	60	240	310	260	280	240
BRIDGEPORT	VEL (MPH)	2.5	6.3	6.0	2.0	11.5	11.5	8.0	9.5	10.7	12.0
	SPD (MPH)	4.6	7.5	7.3	4.7	11.8	11.8	9.2	10.4	11.4	12.2
	RATIO	0.551	0.844	0.813	0.420	0.979	0.977	0.865	0.920	0.940	0.980
METEOROLOGICAL SITE	DIR (DEG)	280	270	300	250	90	270	310	260	260	250
WORCESTER	VEL (MPH)	5.5	6.9	9.5	1.9	0.8	9.3	5.1	8.2	10.5	12.3
	SPD (MPH)	7.9	8.1	10.1	4.0	5.9	9.6	7.0	8.5	11.2	12.4
	RATIO	0.699	0.857	0.945	0.463	0.138	0.968	0.724	0.971	0.934	0.991
HARTFORD-123 (361)	SO2	114	101	100	95	93	89	87	84	83	82
	DATE	2/ 5/85	12/24/85	1/31/85	12/20/85	1/18/85	1/14/85	12/29/85	2/ 1/85	2/21/85	1/28/85
METEOROLOGICAL SITE	DIR (DEG)	40	190	30	10	230	240	240	20	160	300
NEWARK	VEL (MPH)	7.9	2.5	7.1	4.6	3.8	8.0	4.2	10.7	3.6	6.8
	SPD (MPH)	8.9	3.2	7.5	5.9	5.2	8.8	6.3	10.8	7.2	9.3
	RATIO	0.884	0.789	0.950	0.786	0.735	0.911	0.661	0.996	0.496	0.723
METEOROLOGICAL SITE	DIR (DEG)	30	190	10	300	200	240	210	20	190	320
BRADLEY	VEL (MPH)	2.6	1.7	5.1	1.6	1.9	3.9	5.4	5.9	3.3	3.3
	SPD (MPH)	3.6	5.6	5.3	4.2	2.7	4.9	6.5	6.0	4.6	3.3
	RATIO	0.712	0.296	0.966	0.384	0.693	0.803	0.829	0.981	0.711	0.983
METEOROLOGICAL SITE	DIR (DEG)	60	140	40	30	210	250	240	20	130	300
BRIDGEPORT	VEL (MPH)	11.5	2.0	10.5	5.2	6.8	6.3	6.5	8.8	2.5	6.0
	SPD (MPH)	11.8	5.0	10.8	5.8	7.3	7.5	7.8	9.2	4.6	7.3
	RATIO	0.979	0.398	0.974	0.900	0.932	0.844	0.831	0.952	0.551	0.813
METEOROLOGICAL SITE	DIR (DEG)	90	190	60	260	300	270	230	60	280	300
WORCESTER	VEL (MPH)	0.8	5.6	4.0	3.5	7.3	6.9	8.1	5.0	5.5	9.5
	SPD (MPH)	5.9	6.8	5.2	7.9	8.2	8.1	8.3	5.2	7.9	10.1
	RATIO	0.138	0.833	0.763	0.442	0.891	0.857	0.966	0.974	0.699	0.945
MILFORD-002 (349)	SO2	133	132	125	110	109	108	108	105	102	101
	DATE	2/ 9/85	1/26/85	1/ 8/85	12/14/85	1/14/85	4/17/85	12/ 3/85	1/28/85	1/ 5/85	1/17/85
METEOROLOGICAL SITE	DIR (DEG)	310	310	290	310	240	330	310	300	320	220
NEWARK	VEL (MPH)	22.4	19.2	20.7	14.7	8.0	15.9	19.9	6.8	16.6	6.4
	SPD (MPH)	22.9	19.8	22.3	15.2	8.8	16.2	20.3	9.3	17.8	8.1
	RATIO	0.982	0.969	0.930	0.964	0.911	0.978	0.982	0.723	0.931	0.789
METEOROLOGICAL SITE	DIR (DEG)	340	330	330	330	240	330	310	320	340	300
BRADLEY	VEL (MPH)	15.3	9.0	10.6	12.8	3.9	12.9	16.5	3.3	10.2	0.3
	SPD (MPH)	15.5	9.8	11.1	13.2	4.9	13.7	17.1	3.3	10.9	3.6
	RATIO	0.982	0.920	0.960	0.966	0.803	0.945	0.966	0.983	0.932	0.090
METEOROLOGICAL SITE	DIR (DEG)	320	320	310	310	250	330	320	300	310	40
BRIDGEPORT	VEL (MPH)	15.9	13.1	15.2	15.6	6.3	11.3	10.1	6.0	11.3	2.1
	SPD (MPH)	16.1	13.4	15.7	16.1	7.5	11.5	11.1	7.3	11.6	5.6
	RATIO	0.990	0.983	0.971	0.966	0.844	0.984	0.916	0.813	0.973	0.366
METEOROLOGICAL SITE	DIR (DEG)	340	330	320	290	270	300	280	300	340	310
WORCESTER	VEL (MPH)	18.8	17.8	11.3	14.1	6.9	14.3	15.5	9.5	15.2	1.8
	SPD (MPH)	19.0	18.8	12.2	14.5	8.1	15.0	16.0	10.1	16.7	4.9
	RATIO	0.990	0.944	0.926	0.972	0.857	0.956	0.973	0.945	0.913	0.365

TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
NEW BRITAIN-011 (360)	SO2	107	95	86	86	84	79	78	76	76	76
	DATE	2/ 5/85	12/20/85	1/31/85	1/28/85	12/24/85	12/11/85	12/22/85	2/15/85	2/ 4/85	12/21/85
METEOROLOGICAL SITE	DIR (DEG)	40	10	30	300	190	30	230	260	280	300
NEWARK	VEL (MPH)	7.9	4.6	7.1	6.8	2.5	1.3	8.9	9.4	7.4	7.9
	SPD (MPH)	8.9	5.9	7.5	9.3	3.2	5.0	10.1	9.9	8.2	8.6
	RATIO	0.884	0.786	0.950	0.723	0.789	0.260	0.887	0.946	0.907	0.914
METEOROLOGICAL SITE	DIR (DEG)	30	300	10	320	190	10	210	240	320	330
BRADLEY	VEL (MPH)	2.6	1.6	5.1	3.3	1.7	3.2	4.9	5.5	4.3	4.7
	SPD (MPH)	3.6	4.2	5.3	3.3	5.6	3.9	5.9	6.2	6.5	6.5
	RATIO	0.712	0.384	0.966	0.983	0.296	0.834	0.831	0.889	0.665	0.731
METEOROLOGICAL SITE	DIR (DEG)	60	30	40	300	140	50	240	260	250	310
BRIDGEPORT	VEL (MPH)	11.5	5.2	10.5	6.0	2.0	6.5	10.9	9.5	5.1	8.0
	SPD (MPH)	11.8	5.8	10.8	7.3	5.0	8.1	11.4	10.4	6.6	9.2
	RATIO	0.979	0.900	0.974	0.813	0.398	0.810	0.959	0.920	0.765	0.865
METEOROLOGICAL SITE	DIR (DEG)	90	260	60	300	190	340	240	260	290	310
WORCESTER	VEL (MPH)	0.8	3.5	4.0	9.5	5.6	0.5	9.1	8.2	7.1	5.1
	SPD (MPH)	5.9	7.9	5.2	10.1	6.8	5.0	10.9	8.5	7.8	7.0
	RATIO	0.138	0.442	0.763	0.945	0.833	0.093	0.830	0.971	0.921	0.724
NEW HAVEN-017 (341)	SO2	174	147	144	144	141	140	131	123	123	121
	DATE	1/18/85	1/28/85	12/27/85	12/22/85	12/23/85	12/29/85	2/15/85	1/14/85	2/14/85	1/19/85
METEOROLOGICAL SITE	DIR (DEG)	230	300	220	230	190	240	260	240	240	240
NEWARK	VEL (MPH)	3.8	6.8	12.6	8.9	6.4	4.2	9.4	8.0	12.4	8.5
	SPD (MPH)	5.2	9.3	13.2	10.1	7.0	6.3	9.9	8.8	13.1	10.1
	RATIO	0.735	0.723	0.952	0.887	0.909	0.661	0.946	0.911	0.945	0.841
METEOROLOGICAL SITE	DIR (DEG)	200	320	210	210	190	210	240	240	210	240
BRADLEY	VEL (MPH)	1.9	3.3	8.2	4.9	6.4	5.4	5.5	3.9	9.0	5.0
	SPD (MPH)	2.7	3.3	9.2	5.9	6.9	6.5	6.2	4.9	9.9	5.5
	RATIO	0.693	0.983	0.893	0.831	0.932	0.829	0.889	0.803	0.910	0.911
METEOROLOGICAL SITE	DIR (DEG)	210	300	240	240	250	240	260	250	240	260
BRIDGEPORT	VEL (MPH)	6.8	6.0	14.6	10.9	9.2	6.5	9.5	6.3	12.0	9.6
	SPD (MPH)	7.3	7.3	14.8	11.4	9.5	7.8	10.4	7.5	12.2	11.1
	RATIO	0.932	0.813	0.988	0.959	0.972	0.831	0.920	0.844	0.980	0.864
METEOROLOGICAL SITE	DIR (DEG)	300	300	220	240	230	230	260	270	250	260
WORCESTER	VEL (MPH)	7.3	9.5	11.8	9.1	10.4	8.1	8.2	6.9	12.3	5.3
	SPD (MPH)	8.2	10.1	12.4	10.9	10.5	8.3	8.5	8.1	12.4	7.3
	RATIO	0.891	0.945	0.957	0.830	0.989	0.966	0.971	0.857	0.991	0.726
NEW HAVEN-123 (357)	SO2	248	181	168	168	158	154	153	149	146	139
	DATE	2/ 4/85	1/18/85	1/19/85	2/ 5/85	3/27/85	1/14/85	2/15/85	1/28/85	2/21/85	12/20/85
METEOROLOGICAL SITE	DIR (DEG)	280	230	240	40	220	240	260	300	160	10
NEWARK	VEL (MPH)	7.4	3.8	8.5	7.9	10.5	8.0	9.4	6.8	3.6	4.6
	SPD (MPH)	8.2	5.2	10.1	8.9	10.9	8.8	9.9	9.3	7.2	5.9
	RATIO	0.907	0.735	0.841	0.884	0.961	0.911	0.946	0.723	0.496	0.786
METEOROLOGICAL SITE	DIR (DEG)	320	200	240	30	190	240	240	320	190	300
BRADLEY	VEL (MPH)	4.3	1.9	5.0	2.6	5.7	3.9	5.5	3.3	3.3	1.6
	SPD (MPH)	6.5	2.7	5.5	3.6	5.8	4.9	6.2	3.3	4.6	4.2
	RATIO	0.665	0.693	0.911	0.712	0.993	0.803	0.889	0.983	0.711	0.384

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TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	250	210	260	60	220	250	260	300	130	30
BRIDGEPORT	VEL (MPH)	5.1	6.8	9.6	11.5	8.2	6.3	9.5	6.0	2.5	5.2
	SPD (MPH)	6.6	7.3	11.1	11.8	8.5	7.5	10.4	7.3	4.6	5.8
	RATIO	0.765	0.932	0.864	0.979	0.966	0.844	0.920	0.813	0.551	0.900
METEOROLOGICAL SITE	DIR (DEG)	290	300	260	90	240	270	260	300	280	260
WORCESTER	VEL (MPH)	7.1	7.3	5.3	0.8	7.2	6.9	8.2	9.5	5.5	3.5
	SPD (MPH)	7.8	8.2	7.3	5.9	9.1	8.1	8.5	10.1	7.9	7.9
	RATIO	0.921	0.891	0.726	0.138	0.798	0.857	0.971	0.945	0.699	0.442
NORWALK-013 (364)	SO2	122	121	116	110	103	102	94	94	89	88
	DATE	1/28/85	2/ 4/85	12/20/85	1/14/85	1/31/85	1/19/85	2/ 5/85	12/24/85	12/ 9/85	12/23/85
METEOROLOGICAL SITE	DIR (DEG)	300	280	10	240	30	240	40	190	270	190
NEWARK	VEL (MPH)	6.8	7.4	4.6	8.0	7.1	8.5	7.9	2.5	4.9	6.4
	SPD (MPH)	9.3	8.2	5.9	8.8	7.5	10.1	8.9	3.2	5.8	7.0
	RATIO	0.723	0.907	0.786	0.911	0.950	0.841	0.884	0.789	0.848	0.909
METEOROLOGICAL SITE	DIR (DEG)	320	320	300	240	10	240	30	190	330	190
BRADLEY	VEL (MPH)	3.3	4.3	1.6	3.9	5.1	5.0	2.6	1.7	2.8	6.4
	SPD (MPH)	3.3	6.5	4.2	4.9	5.3	5.5	3.6	5.6	3.7	6.9
	RATIO	0.983	0.665	0.384	0.803	0.966	0.911	0.712	0.296	0.759	0.932
METEOROLOGICAL SITE	DIR (DEG)	300	250	30	250	40	260	60	140	270	250
BRIDGEPORT	VEL (MPH)	6.0	5.1	5.2	6.3	10.5	9.6	11.5	2.0	5.6	9.2
	SPD (MPH)	7.3	6.6	5.8	7.5	10.8	11.1	11.8	5.0	5.9	9.5
	RATIO	0.813	0.765	0.900	0.844	0.974	0.864	0.979	0.398	0.945	0.972
METEOROLOGICAL SITE	DIR (DEG)	300	290	260	270	60	260	90	190	280	230
WORCESTER	VEL (MPH)	9.5	7.1	3.5	6.9	4.0	5.3	0.8	5.6	5.7	10.4
	SPD (MPH)	10.1	7.8	7.9	8.1	5.2	7.3	5.9	6.8	6.3	10.5
	RATIO	0.945	0.921	0.442	0.857	0.763	0.726	0.138	0.833	0.904	0.989
PRESTON-002 (349)	SO2	52	50	49	49	46	46	46	45	44	43
	DATE	1/24/85	2/23/85	1/28/85	1/14/85	2/14/85	2/16/85	2/ 5/85	1/22/85	3/27/85	12/21/85
METEOROLOGICAL SITE	DIR (DEG)	250	200	300	240	240	250	40	250	220	300
NEWARK	VEL (MPH)	12.0	8.7	6.8	8.0	12.4	10.7	7.9	17.3	10.5	7.9
	SPD (MPH)	12.7	9.2	9.3	8.8	13.1	11.5	8.9	17.4	10.9	8.6
	RATIO	0.947	0.944	0.723	0.911	0.945	0.930	0.884	0.994	0.961	0.914
METEOROLOGICAL SITE	DIR (DEG)	220	180	320	240	210	240	30	270	190	330
BRADLEY	VEL (MPH)	4.7	3.9	3.3	3.9	9.0	6.4	2.6	8.5	5.7	4.7
	SPD (MPH)	6.0	4.0	3.3	4.9	9.9	7.2	3.6	10.8	5.8	6.5
	RATIO	0.786	0.969	0.983	0.803	0.910	0.892	0.712	0.789	0.993	0.731
METEOROLOGICAL SITE	DIR (DEG)	250	230	300	250	240	240	60	270	220	310
BRIDGEPORT	VEL (MPH)	11.2	3.7	6.0	6.3	12.0	11.5	11.5	15.3	8.2	8.0
	SPD (MPH)	11.4	5.2	7.3	7.5	12.2	11.8	11.8	15.7	8.5	9.2
	RATIO	0.987	0.715	0.813	0.844	0.980	0.977	0.979	0.978	0.966	0.865
METEOROLOGICAL SITE	DIR (DEG)	290	270	300	270	250	270	90	280	240	310
WORCESTER	VEL (MPH)	11.9	9.9	9.5	6.9	12.3	9.3	0.8	22.6	7.2	5.1
	SPD (MPH)	12.1	10.4	10.1	8.1	12.4	9.6	5.9	22.9	9.1	7.0
	RATIO	0.982	0.959	0.945	0.857	0.991	0.968	0.138	0.987	0.798	0.724

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TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
STAMFORD-025 (280)	SO2	123	104	102	96	94	86	86	86	86	83
	DATE	12/20/85	1/28/85	1/14/85	2/21/85	1/31/85	12/23/85	12/ 9/85	2/ 4/85	12/ 5/85	1/19/85
METEOROLOGICAL SITE	DIR (DEG)	10	300	240	160	30	190	270	280	10	240
NEWARK	VEL (MPH)	4.6	6.8	8.0	3.6	7.1	6.4	4.9	7.4	4.5	8.5
	SPD (MPH)	5.9	9.3	8.8	7.2	7.5	7.0	5.8	8.2	5.6	10.1
	RATIO	0.786	0.723	0.911	0.496	0.950	0.909	0.848	0.907	0.805	0.841
METEOROLOGICAL SITE	DIR (DEG)	300	320	240	190	10	190	330	320	20	240
BRADLEY	VEL (MPH)	1.6	3.3	3.9	3.3	5.1	6.4	2.8	4.3	3.1	5.0
	SPD (MPH)	4.2	3.3	4.9	4.6	5.3	6.9	3.7	6.5	3.4	5.5
	RATIO	0.384	0.983	0.803	0.711	0.966	0.932	0.759	0.665	0.913	0.911
METEOROLOGICAL SITE	DIR (DEG)	30	300	250	130	40	250	270	250	40	260
BRIDGEPORT	VEL (MPH)	5.2	6.0	6.3	2.5	10.5	9.2	5.6	5.1	4.1	9.6
	SPD (MPH)	5.8	7.3	7.5	4.6	10.8	9.5	5.9	6.6	5.5	11.1
	RATIO	0.900	0.813	0.844	0.551	0.974	0.972	0.945	0.765	0.751	0.864
METEOROLOGICAL SITE	DIR (DEG)	260	300	270	280	60	230	280	290	350	260
WORCESTER	VEL (MPH)	3.5	9.5	6.9	5.5	4.0	10.4	5.7	7.1	4.5	5.3
	SPD (MPH)	7.9	10.1	8.1	7.9	5.2	10.5	6.3	7.8	5.9	7.3
	RATIO	0.442	0.945	0.857	0.699	0.763	0.989	0.904	0.921	0.759	0.726
STAMFORD-123 (353)	SO2	124	113	110	108	102	100	97	94	93	89
	DATE	1/31/85	12/20/85	1/14/85	2/ 5/85	1/15/85	1/19/85	2/14/85	1/28/85	2/ 4/85	1/24/85
METEOROLOGICAL SITE	DIR (DEG)	30	10	240	40	300	240	240	300	280	250
NEWARK	VEL (MPH)	7.1	4.6	8.0	7.9	20.2	8.5	12.4	6.8	7.4	12.0
	SPD (MPH)	7.5	5.9	8.8	8.9	21.1	10.1	13.1	9.3	8.2	12.7
	RATIO	0.950	0.786	0.911	0.884	0.955	0.841	0.945	0.723	0.907	0.947
METEOROLOGICAL SITE	DIR (DEG)	10	300	240	30	340	240	210	320	320	220
BRADLEY	VEL (MPH)	5.1	1.6	3.9	2.6	10.8	5.0	9.0	3.3	4.3	4.7
	SPD (MPH)	5.3	4.2	4.9	3.6	11.2	5.5	9.9	3.3	6.5	6.0
	RATIO	0.966	0.384	0.803	0.712	0.959	0.911	0.910	0.983	0.665	0.786
METEOROLOGICAL SITE	DIR (DEG)	40	30	250	60	300	260	240	300	250	250
BRIDGEPORT	VEL (MPH)	10.5	5.2	6.3	11.5	12.7	9.6	12.0	6.0	5.1	11.2
	SPD (MPH)	10.8	5.8	7.5	11.8	12.8	11.1	12.2	7.3	6.6	11.4
	RATIO	0.974	0.900	0.844	0.979	0.993	0.864	0.980	0.813	0.765	0.987
METEOROLOGICAL SITE	DIR (DEG)	60	260	270	90	320	260	250	300	290	290
WORCESTER	VEL (MPH)	4.0	3.5	6.9	0.8	12.9	5.3	12.3	9.5	7.1	11.9
	SPD (MPH)	5.2	7.9	8.1	5.9	13.5	7.3	12.4	10.1	7.8	12.1
	RATIO	0.763	0.442	0.857	0.138	0.956	0.726	0.991	0.945	0.921	0.982
WATERBURY-123 (351)	SO2	98	92	91	91	88	82	81	81	80	79
	DATE	1/28/85	12/ 9/85	1/18/85	12/24/85	2/ 5/85	2/ 4/85	2/21/85	1/14/85	12/29/85	2/17/85
METEOROLOGICAL SITE	DIR (DEG)	300	270	230	190	40	280	160	240	240	240
NEWARK	VEL (MPH)	6.8	4.9	3.8	2.5	7.9	7.4	3.6	8.0	4.2	11.6
	SPD (MPH)	9.3	5.8	5.2	3.2	8.9	8.2	7.2	8.8	6.3	12.5
	RATIO	0.723	0.848	0.735	0.789	0.884	0.907	0.496	0.911	0.661	0.930
METEOROLOGICAL SITE	DIR (DEG)	320	330	200	190	30	320	190	240	210	220
BRADLEY	VEL (MPH)	3.3	2.8	1.9	1.7	2.6	4.3	3.3	3.9	5.4	6.5
	SPD (MPH)	3.3	3.7	2.7	5.6	3.6	6.5	4.6	4.9	6.5	8.2
	RATIO	0.983	0.759	0.693	0.296	0.712	0.665	0.711	0.803	0.829	0.796

TABLE 17, CONTINUED

1985 TEN HIGHEST 24-HOUR AVERAGE SO2 DAYS WITH WIND DATA

UNITS : MICROGRAMS / CUBIC METER

TOWN-SITE (SAMPLES)	RANK	1	2	3	4	5	6	7	8	9	10
METEOROLOGICAL SITE	DIR (DEG)	300	270	210	140	60	250	130	250	240	240
BRIDGEPORT	VEL (MPH)	6.0	5.6	6.8	2.0	11.5	5.1	2.5	6.3	6.5	9.0
	SPD (MPH)	7.3	5.9	7.3	5.0	11.8	6.6	4.6	7.5	7.8	9.6
	RATIO	0.813	0.945	0.932	0.398	0.979	0.765	0.551	0.844	0.831	0.939
METEOROLOGICAL SITE	DIR (DEG)	300	280	300	190	90	290	280	270	230	260
WORCESTER	VEL (MPH)	9.5	5.7	7.3	5.6	0.8	7.1	5.5	6.9	8.1	12.3
	SPD (MPH)	10.1	6.3	8.2	6.8	5.9	7.8	7.9	8.1	8.3	12.7
	RATIO	0.945	0.904	0.891	0.833	0.138	0.921	0.699	0.857	0.966	0.969

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 1985 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 1985. Levels in excess of the one-hour NAAQS of 0.12 ppm were frequently recorded at each of the ten monitored sites. Two sites experienced levels greater than 0.20 ppm in 1985, as opposed to five sites in 1984 and nine sites in 1983. Both the highest and the second highest one-hour concentrations decreased at all but the Middletown site in 1985, when compared to 1984.

The incidence of ozone levels in excess of the 1-hour 0.12 ppm standard was less in 1985 compared to 1984 (see Table 19). There was a total of 332 exceedances in 1984 and 152 in 1985 at those monitored sites that operated in both years. This represents a drop in the frequency of such exceedances from 9.2 per 1000 sampling hours in 1984 to 4.2 per 1000 sampling hours in 1985: a 54% 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 146 to 72. On this basis, the state experienced a 50% 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 128 in 1984 to 62 in 1985 at those monitoring sites that operated in both years (see Table 18). This represents a decrease in the frequency of such occurrences from 8.5 per 100 sampling days in 1984 to 4.1 per 100 sampling days in 1985: a 52% 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 34 to 21. On this basis, the state experienced a 38% drop in the frequency of daily exceedances of the standard.

The yearly changes in ozone concentrations can be attributed to year-to-year variations in regional weather conditions, especially wind direction, temperature and the amount of sunlight. 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. The percentage of southwest winds during the "ozone season" remained about the same from 1984 to 1985, 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. Ozone production is greatest at high temperatures and in strong sunlight. The summer season's daily high temperatures were lower in 1985 than in 1984. This is demonstrated by the number of days exceeding 90° F which decreased from nine in 1984 to three in 1985 at Sikorsky Airport in Bridgeport. At Bradley International Airport, the number of days exceeding 90°F decreased from twelve in 1984 to five in 1985. The percentage of possible sunshine at Bradley averaged 63% in 1984 and 59% in 1985 for the months June through September. The average for the summer months at Bradley is normally about 62%. This decrease in the percentage of possible sunshine and the resulting decrease in high temperature days are believed to be major factors in the decrease in the number of high ozone days in Connecticut in 1985.

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 1985 (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 147 precision checks during 1985. The resulting 95% probability limits were -6% to + 10%. 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, -6% to + 6%; medium, -9% to + 7%; and high, -9% to + 10%.

1-Hour Average - The 1-hour ozone standard was exceeded at all ten DEP monitoring sites in 1985. Moreover, the highest 1-hour average ozone concentrations were lower in 1985 than in 1984 at all the sites except Middletown 007. Danbury 123 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 1985. 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., 72%) 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.

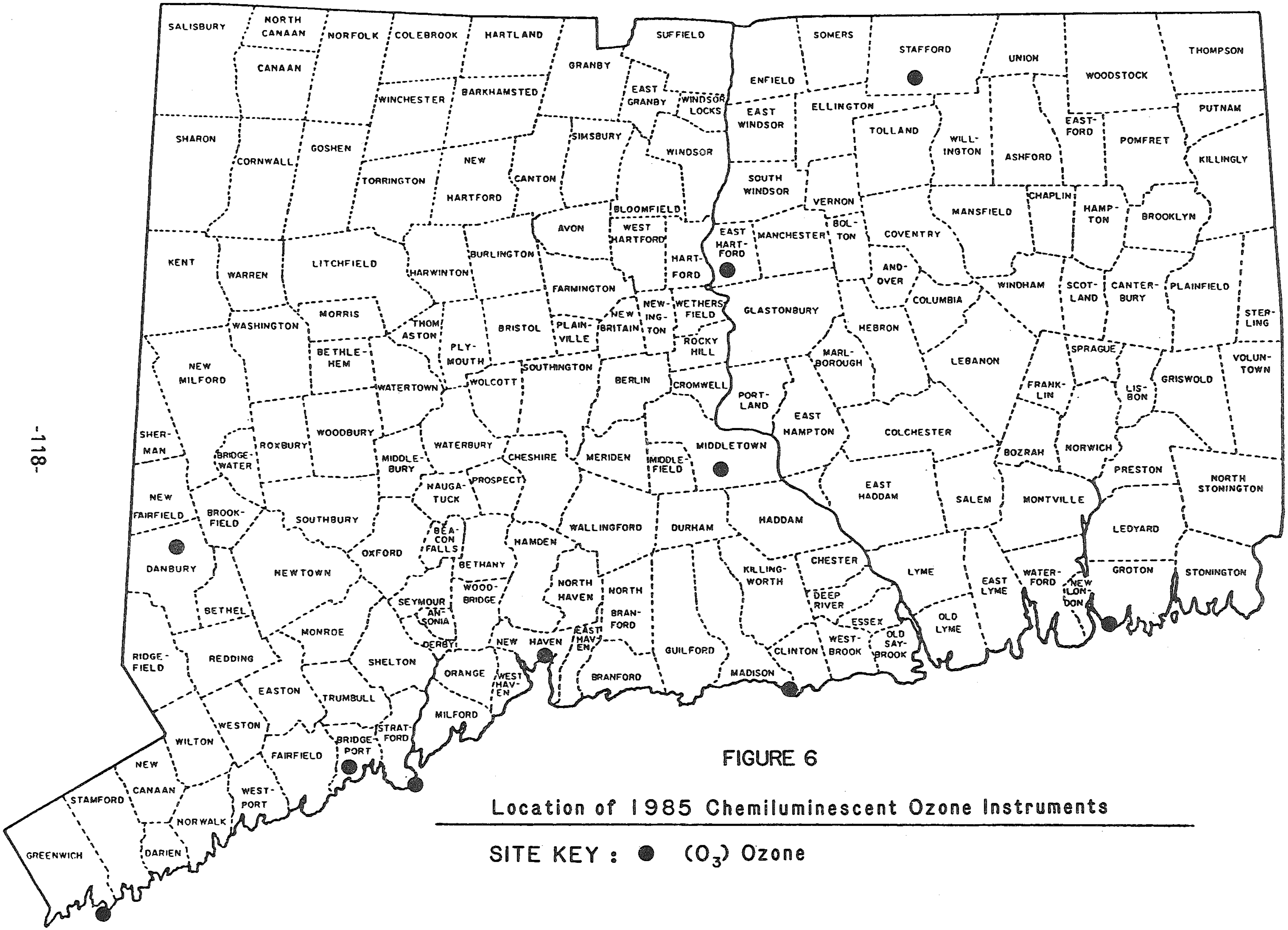


FIGURE 6

Location of 1985 Chemiluminescent Ozone Instruments

SITE KEY : ● (O_3) Ozone

TABLE 18

NUMBER OF DAYS WHEN THE 1-HOUR OZONE STANDARD WAS EXCEEDED IN 1985

SITE	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	TOTAL	TOTAL FOR LAST YEAR
Bridgeport-123	0	0	0	2	2	0	4	12
Danbury-123	0	1	0	2	1	0	4	13
E. Hartford-003	0	2	0	0	1	0	3	7
Greenwich-017	0	2	1	4	5	1	13	17
Madison-002	0	0	1	4	2	0	7	18
Middletown-007	0	3	1	3	2	1	10	14
New Haven-123	0	0	1	3	2	0	6	12
Stafford-007	0	3	0	0	1	0	4	7
Stratford-007	0	1	2	5	3	2	13	28
						TOTAL SITE DAYS	~~62~~ 64	128
						TOTAL INDIVIDUAL DAYS	21	34

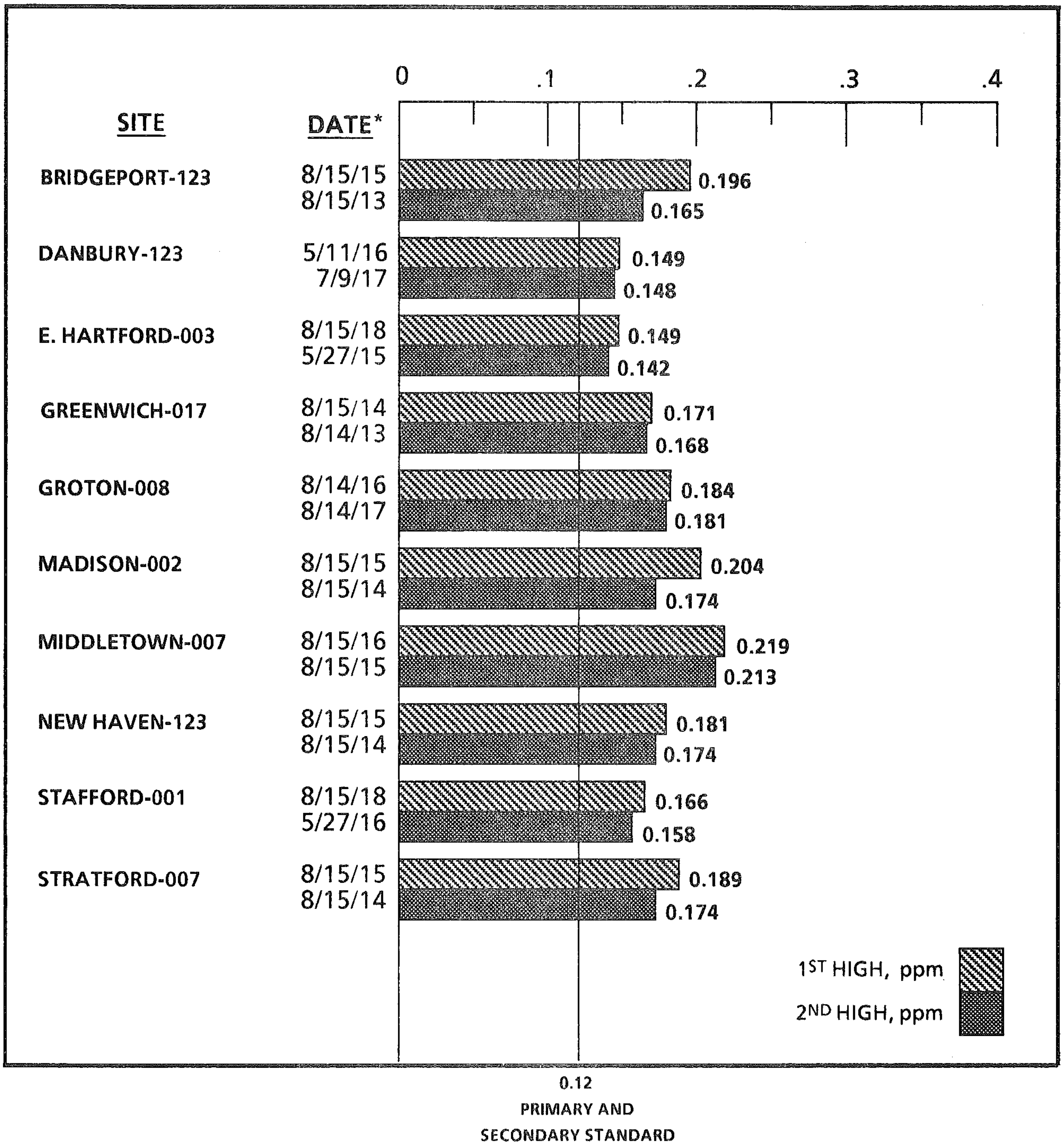
TABLE 19

NUMBER OF EXCEEDANCES OF THE 1-HOUR OZONE STANDARD IN 1985

SITE	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	TOTAL	TOTAL FOR LAST YEAR
Bridgeport-123	0	0	0	3	7	0	10	33
Danbury-123	0	1	0	4	1	0	6	26
E. Hartford-003	0	3	0	0	1	0	4	9
Greenwich-017	0	3	1	6	14	1	25	49
Madison-002	0	0	1	10	10	0	21	53
Middletown-007	0	4	1	5	11	1	22	29
New Haven-123	0	0	2	5	7	0	14	29
Stafford-00~~7~~1	0	7	0	0	4	0	11	15
Stratford-007	0	1	5	18	12	3	39	89
						TOTAL SITE HOURS	152	332
						TOTAL INDIVIDUAL HOURS	72	146

TABLE 20

1985 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.

TABLE 21

1985 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 (4076)	OZONE	0.196	0.132	0.131	0.129	0.121	0.118	0.116	0.112	0.105	0.105
	DATE	8/15/85	7/ 9/85	8/14/85	7/19/85	5/27/85	7/16/85	5/26/85	7/20/85	6/ 2/85	6/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	230	170	230	210	220	220	270	250	230	200
NEWARK	VEL (MPH)	11.0	2.6	6.1	9.5	8.3	3.8	3.3	9.1	6.9	5.6
	SPD (MPH)	11.4	6.6	9.5	9.9	10.1	7.0	8.1	9.8	8.6	6.6
	RATIO	0.968	0.395	0.645	0.955	0.821	0.533	0.405	0.933	0.798	0.841
METEOROLOGICAL SITE	DIR (DEG)	210	190	210	220	220	210	130	290	220	190
BRADLEY	VEL (MPH)	5.9	3.8	1.7	6.9	7.3	5.0	1.5	5.5	5.9	4.0
	SPD (MPH)	6.5	5.0	4.7	7.6	8.1	6.3	5.5	7.2	7.0	4.7
	RATIO	0.907	0.759	0.367	0.906	0.909	0.795	0.281	0.761	0.832	0.836
METEOROLOGICAL SITE	DIR (DEG)	220	130	220	230	230	160	160	230	230	160
BRIDGEPORT	VEL (MPH)	8.1	4.6	6.8	8.6	5.9	4.8	3.1	7.8	7.4	3.0
	SPD (MPH)	8.5	5.6	7.3	9.1	7.6	5.8	7.0	7.9	8.2	5.5
	RATIO	0.950	0.824	0.922	0.948	0.772	0.843	0.434	0.982	0.899	0.548
METEOROLOGICAL SITE	DIR (DEG)	250	220	260	240	220	220	40	270	240	220
WORCESTER	VEL (MPH)	6.8	5.3	8.6	9.1	8.4	8.0	1.4	11.6	10.2	7.2
	SPD (MPH)	8.3	6.2	9.5	9.3	9.5	8.8	8.8	11.8	10.8	9.5
	RATIO	0.817	0.857	0.907	0.977	0.881	0.907	0.165	0.983	0.947	0.762
DANBURY-123 (3898)	OZONE	0.149	0.148	0.142	0.126	0.122	0.120	0.115	0.113	0.110	0.107
	DATE	5/11/85	7/ 9/85	8/15/85	7/ 6/85	8/ 5/85	8/24/85	9/20/85	8/10/85	7/19/85	9/21/85
METEOROLOGICAL SITE	DIR (DEG)	230	170	230	200	190	140	220	160	210	240
NEWARK	VEL (MPH)	10.9	2.6	11.0	7.6	5.8	5.3	8.2	3.7	9.5	8.4
	SPD (MPH)	11.2	6.6	11.4	8.3	7.6	8.5	8.3	7.2	9.9	8.9
	RATIO	0.971	0.395	0.968	0.913	0.759	0.619	0.981	0.514	0.955	0.939
METEOROLOGICAL SITE	DIR (DEG)	220	190	210	180	180	180	200	180	220	210
BRADLEY	VEL (MPH)	5.1	3.8	5.9	6.9	4.4	4.2	3.8	2.7	6.9	3.8
	SPD (MPH)	6.3	5.0	6.5	7.0	4.5	4.7	5.0	6.0	7.6	4.9
	RATIO	0.803	0.759	0.907	0.981	0.984	0.890	0.758	0.448	0.906	0.769
METEOROLOGICAL SITE	DIR (DEG)	220	130	220	190	200	150	220	150	230	240
BRIDGEPORT	VEL (MPH)	7.1	4.6	8.1	6.7	6.6	4.3	6.5	2.6	8.6	7.7
	SPD (MPH)	7.3	5.6	8.5	7.0	7.3	6.3	6.8	4.6	9.1	7.9
	RATIO	0.965	0.824	0.950	0.957	0.896	0.681	0.964	0.571	0.948	0.978
METEOROLOGICAL SITE	DIR (DEG)	250	220	250	210	230	230	240	230	240	250
WORCESTER	VEL (MPH)	9.6	5.3	6.8	8.3	5.7	5.5	8.0	3.6	9.1	8.5
	SPD (MPH)	10.6	6.2	8.3	8.6	6.5	6.3	8.2	5.6	9.3	8.8
	RATIO	0.904	0.857	0.817	0.966	0.879	0.865	0.977	0.644	0.977	0.966
EAST HARTFORD-003 (3985)	OZONE	0.149	0.142	0.126	0.119	0.117	0.107	0.100	0.100	0.098	0.095
	DATE	8/15/85	5/27/85	5/11/85	7/ 9/85	5/13/85	8/ 5/85	7/19/85	8/14/85	5/10/85	8/10/85
METEOROLOGICAL SITE	DIR (DEG)	230	220	230	170	230	190	210	230	240	160
NEWARK	VEL (MPH)	11.0	8.3	10.9	2.6	10.7	5.8	9.5	6.1	14.0	3.7
	SPD (MPH)	11.4	10.1	11.2	6.6	11.8	7.6	9.9	9.5	14.4	7.2
	RATIO	0.968	0.821	0.971	0.395	0.909	0.759	0.955	0.645	0.976	0.514
METEOROLOGICAL SITE	DIR (DEG)	210	220	220	190	180	180	220	210	210	180
BRADLEY	VEL (MPH)	5.9	7.3	5.1	3.8	7.3	4.4	6.9	1.7	10.9	2.7
	SPD (MPH)	6.5	8.1	6.3	5.0	9.1	4.5	7.6	4.7	11.8	6.0
	RATIO	0.907	0.909	0.803	0.759	0.807	0.984	0.906	0.367	0.927	0.448

TABLE 21, CONTINUED

1985 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)	220	230	220	130	200	200	230	220	230	150
BRIDGEPORT	VEL (MPH)	8.1	5.9	7.1	4.6	7.4	6.6	8.6	6.8	11.3	2.6
	SPD (MPH)	8.5	7.6	7.3	5.6	8.1	7.3	9.1	7.3	11.6	4.6
	RATIO	0.950	0.772	0.965	0.824	0.916	0.896	0.948	0.922	0.968	0.571
METEOROLOGICAL SITE	DIR (DEG)	250	220	250	220	220	230	240	260	230	230
WORCESTER	VEL (MPH)	6.8	8.4	9.6	5.3	8.4	5.7	9.1	8.6	20.8	3.6
	SPD (MPH)	8.3	9.5	10.6	6.2	9.5	6.5	9.3	9.5	21.0	5.6
	RATIO	0.817	0.881	0.904	0.857	0.886	0.879	0.977	0.907	0.990	0.644
GREENWICH-017 (3778)	OZONE	0.171	0.168	0.148	0.143	0.135	0.133	0.132	0.129	0.129	0.127
	DATE	8/15/85	8/14/85	7/30/85	5/27/85	8/ 5/85	5/26/85	7/ 9/85	7/19/85	9/20/85	6/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	230	230	290	220	190	270	170	210	220	200
NEWARK	VEL (MPH)	11.0	6.1	6.0	8.3	5.8	3.3	2.6	9.5	8.2	5.6
	SPD (MPH)	11.4	9.5	9.9	10.1	7.6	8.1	6.6	9.9	8.3	6.6
	RATIO	0.968	0.645	0.609	0.821	0.759	0.405	0.395	0.955	0.981	0.841
METEOROLOGICAL SITE	DIR (DEG)	210	210	290	220	180	130	190	220	200	190
BRADLEY	VEL (MPH)	5.9	1.7	4.4	7.3	4.4	1.5	3.8	6.9	3.8	4.0
	SPD (MPH)	6.5	4.7	6.0	8.1	4.5	5.5	5.0	7.6	5.0	4.7
	RATIO	0.907	0.367	0.723	0.909	0.984	0.281	0.759	0.906	0.758	0.836
METEOROLOGICAL SITE	DIR (DEG)	220	220	260	230	200	160	130	230	220	160
BRIDGEPORT	VEL (MPH)	8.1	6.8	6.3	5.9	6.6	3.1	4.6	8.6	6.5	3.0
	SPD (MPH)	8.5	7.3	7.9	7.6	7.3	7.0	5.6	9.1	6.8	5.5
	RATIO	0.950	0.922	0.792	0.772	0.896	0.434	0.824	0.948	0.964	0.548
METEOROLOGICAL SITE	DIR (DEG)	250	260	280	220	230	40	220	240	240	220
WORCESTER	VEL (MPH)	6.8	8.6	5.0	8.4	5.7	1.4	5.3	9.1	8.0	7.2
	SPD (MPH)	8.3	9.5	7.5	9.5	6.5	8.8	6.2	9.3	8.2	9.5
	RATIO	0.817	0.907	0.674	0.881	0.879	0.165	0.857	0.977	0.977	0.762
GROTON-008 (3982)	OZONE	0.184	0.152	0.150	0.141	0.137	0.136	0.135	0.133	0.128	0.124
	DATE	8/14/85	7/30/85	7/20/85	6/ 3/85	7/ 9/85	7/19/85	9/21/85	7/10/85	9/19/85	9/20/85
METEOROLOGICAL SITE	DIR (DEG)	230	290	250	320	170	210	240	230	210	220
NEWARK	VEL (MPH)	6.1	6.0	9.1	3.1	2.6	9.5	8.4	8.7	4.5	8.2
	SPD (MPH)	9.5	9.9	9.8	8.2	6.6	9.9	8.9	9.8	5.0	8.3
	RATIO	0.645	0.609	0.933	0.373	0.395	0.955	0.939	0.885	0.901	0.981
METEOROLOGICAL SITE	DIR (DEG)	210	290	290	340	190	220	210	200	250	200
BRADLEY	VEL (MPH)	1.7	4.4	5.5	1.8	3.8	6.9	3.8	5.9	1.2	3.8
	SPD (MPH)	4.7	6.0	7.2	4.0	5.0	7.6	4.9	7.2	2.9	5.0
	RATIO	0.367	0.723	0.761	0.457	0.759	0.906	0.769	0.821	0.419	0.758
METEOROLOGICAL SITE	DIR (DEG)	220	260	230	210	130	230	240	210	220	220
BRIDGEPORT	VEL (MPH)	6.8	6.3	7.8	5.7	4.6	8.6	7.7	5.6	4.5	6.5
	SPD (MPH)	7.3	7.9	7.9	6.3	5.6	9.1	7.9	5.9	4.6	6.8
	RATIO	0.922	0.792	0.982	0.907	0.824	0.948	0.978	0.956	0.981	0.964
METEOROLOGICAL SITE	DIR (DEG)	260	280	270	270	220	240	250	220	270	240
WORCESTER	VEL (MPH)	8.6	5.0	11.6	11.1	5.3	9.1	8.5	7.7	6.9	8.0
	SPD (MPH)	9.5	7.5	11.8	11.6	6.2	9.3	8.8	7.8	7.5	8.2
	RATIO	0.907	0.674	0.983	0.950	0.857	0.977	0.966	0.989	0.917	0.977

TABLE 21, CONTINUED

1985 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 (3883)	OZONE	0.204	0.149	0.143	0.135	0.133	0.125	0.125	0.124	0.115	0.114
	DATE	8/15/85	8/14/85	7/19/85	7/30/85	7/10/85	6/ 3/85	7/20/85	6/22/85	6/ 2/85	7/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	230	230	210	290	230	320	250	190	230	170
NEWARK	VEL (MPH)	11.0	6.1	9.5	6.0	8.7	3.1	9.1	8.5	6.9	2.6
	SPD (MPH)	11.4	9.5	9.9	9.9	9.8	8.2	9.8	9.1	8.6	6.6
	RATIO	0.968	0.645	0.955	0.609	0.885	0.373	0.933	0.942	0.798	0.395
METEOROLOGICAL SITE	DIR (DEG)	210	210	220	290	200	340	290	190	220	190
BRADLEY	VEL (MPH)	5.9	1.7	6.9	4.4	5.9	1.8	5.5	5.1	5.9	3.8
	SPD (MPH)	6.5	4.7	7.6	6.0	7.2	4.0	7.2	5.2	7.0	5.0
	RATIO	0.907	0.367	0.906	0.723	0.821	0.457	0.761	0.989	0.832	0.759
METEOROLOGICAL SITE	DIR (DEG)	220	220	230	260	210	210	230	150	230	130
BRIDGEPORT	VEL (MPH)	8.1	6.8	8.6	6.3	5.6	5.7	7.8	4.2	7.4	4.6
	SPD (MPH)	8.5	7.3	9.1	7.9	5.9	6.3	7.9	7.5	8.2	5.6
	RATIO	0.950	0.922	0.948	0.792	0.956	0.907	0.982	0.564	0.899	0.824
METEOROLOGICAL SITE	DIR (DEG)	250	260	240	280	220	270	270	230	240	220
WORCESTER	VEL (MPH)	6.8	8.6	9.1	5.0	7.7	11.1	11.6	5.5	10.2	5.3
	SPD (MPH)	8.3	9.5	9.3	7.5	7.8	11.6	11.8	6.5	10.8	6.2
	RATIO	0.817	0.907	0.977	0.674	0.989	0.950	0.983	0.857	0.947	0.857
MIDDLETOWN-007 (4071)	OZONE	0.219	0.153	0.152	0.137	0.134	0.134	0.128	0.127	0.127	0.127
	DATE	8/15/85	8/14/85	7/19/85	5/27/85	5/13/85	9/20/85	6/ 2/85	5/11/85	7/10/85	7/ 9/85
METEOROLOGICAL SITE	DIR (DEG)	230	230	210	220	230	220	230	230	230	170
NEWARK	VEL (MPH)	11.0	6.1	9.5	8.3	10.7	8.2	6.9	10.9	8.7	2.6
	SPD (MPH)	11.4	9.5	9.9	10.1	11.8	8.3	8.6	11.2	9.8	6.6
	RATIO	0.968	0.645	0.955	0.821	0.909	0.981	0.798	0.971	0.885	0.395
METEOROLOGICAL SITE	DIR (DEG)	210	210	220	220	180	200	220	220	200	190
BRADLEY	VEL (MPH)	5.9	1.7	6.9	7.3	7.3	3.8	5.9	5.1	5.9	3.8
	SPD (MPH)	6.5	4.7	7.6	8.1	9.1	5.0	7.0	6.3	7.2	5.0
	RATIO	0.907	0.367	0.906	0.909	0.807	0.758	0.832	0.803	0.821	0.759
METEOROLOGICAL SITE	DIR (DEG)	220	220	230	230	200	220	230	220	210	130
BRIDGEPORT	VEL (MPH)	8.1	6.8	8.6	5.9	7.4	6.5	7.4	7.1	5.6	4.6
	SPD (MPH)	8.5	7.3	9.1	7.6	8.1	6.8	8.2	7.3	5.9	5.6
	RATIO	0.950	0.922	0.948	0.772	0.916	0.964	0.899	0.965	0.956	0.824
METEOROLOGICAL SITE	DIR (DEG)	250	260	240	220	220	240	240	250	220	220
WORCESTER	VEL (MPH)	6.8	8.6	9.1	8.4	8.4	8.0	10.2	9.6	7.7	5.3
	SPD (MPH)	8.3	9.5	9.3	9.5	9.5	8.2	10.8	10.6	7.8	6.2
	RATIO	0.817	0.907	0.977	0.881	0.886	0.977	0.947	0.904	0.989	0.857
NEW HAVEN-123 (4088)	OZONE	0.181	0.149	0.139	0.138	0.137	0.132	0.122	0.120	0.117	0.115
	DATE	8/15/85	7/19/85	8/14/85	6/22/85	7/ 9/85	7/10/85	9/20/85	8/10/85	6/ 3/85	6/ 2/85
METEOROLOGICAL SITE	DIR (DEG)	230	210	230	190	170	230	220	160	320	230
NEWARK	VEL (MPH)	11.0	9.5	6.1	8.5	2.6	8.7	8.2	3.7	3.1	6.9
	SPD (MPH)	11.4	9.9	9.5	9.1	6.6	9.8	8.3	7.2	8.2	8.6
	RATIO	0.968	0.955	0.645	0.942	0.395	0.885	0.981	0.514	0.373	0.798
METEOROLOGICAL SITE	DIR (DEG)	210	220	210	190	190	200	200	180	340	220
BRADLEY	VEL (MPH)	5.9	6.9	1.7	5.1	3.8	5.9	3.8	2.7	1.8	5.9
	SPD (MPH)	6.5	7.6	4.7	5.2	5.0	7.2	5.0	6.0	4.0	7.0
	RATIO	0.907	0.906	0.367	0.989	0.759	0.821	0.758	0.448	0.457	0.832

TABLE 21, CONTINUED

1985 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)	220	230	220	150	130	210	220	150	210	230
BRIDGEPORT	VEL (MPH)	8.1	8.6	6.8	4.2	4.6	5.6	6.5	2.6	5.7	7.4
	SPD (MPH)	8.5	9.1	7.3	7.5	5.6	5.9	6.8	4.6	6.3	8.2
	RATIO	0.950	0.948	0.922	0.564	0.824	0.956	0.964	0.571	0.907	0.899
METEOROLOGICAL SITE	DIR (DEG)	250	240	260	230	220	220	240	230	270	240
WORCESTER	VEL (MPH)	6.8	9.1	8.6	5.5	5.3	7.7	8.0	3.6	11.1	10.2
	SPD (MPH)	8.3	9.3	9.5	6.5	6.2	7.8	8.2	5.6	11.6	10.8
	RATIO	0.817	0.977	0.907	0.857	0.857	0.989	0.977	0.644	0.950	0.947
STAFFORD-001 (4110)	OZONE	0.166	0.158	0.142	0.139	0.124	0.124	0.117	0.114	0.106	0.104
	DATE	8/15/85	5/27/85	5/11/85	5/13/85	5/10/85	6/ 2/85	5/20/85	7/19/85	7/ 9/85	9/20/85
METEOROLOGICAL SITE	DIR (DEG)	230	220	230	230	240	230	220	210	170	220
NEWARK	VEL (MPH)	11.0	8.3	10.9	10.7	14.0	6.9	13.6	9.5	2.6	8.2
	SPD (MPH)	11.4	10.1	11.2	11.8	14.4	8.6	13.9	9.9	6.6	8.3
	RATIO	0.968	0.821	0.971	0.909	0.976	0.798	0.974	0.955	0.395	0.981
METEOROLOGICAL SITE	DIR (DEG)	210	220	220	180	210	220	200	220	190	200
BRADLEY	VEL (MPH)	5.9	7.3	5.1	7.3	10.9	5.9	10.2	6.9	3.8	3.8
	SPD (MPH)	6.5	8.1	6.3	9.1	11.8	7.0	10.6	7.6	5.0	5.0
	RATIO	0.907	0.909	0.803	0.807	0.927	0.832	0.958	0.906	0.759	0.758
METEOROLOGICAL SITE	DIR (DEG)	220	230	220	200	230	230	200	230	130	220
BRIDGEPORT	VEL (MPH)	8.1	5.9	7.1	7.4	11.3	7.4	8.6	8.6	4.6	6.5
	SPD (MPH)	8.5	7.6	7.3	8.1	11.6	8.2	10.1	9.1	5.6	6.8
	RATIO	0.950	0.772	0.965	0.916	0.968	0.899	0.856	0.948	0.824	0.964
METEOROLOGICAL SITE	DIR (DEG)	250	220	250	220	230	240	210	240	220	240
WORCESTER	VEL (MPH)	6.8	8.4	9.6	8.4	20.8	10.2	15.7	9.1	5.3	8.0
	SPD (MPH)	8.3	9.5	10.6	9.5	21.0	10.8	16.2	9.3	6.2	8.2
	RATIO	0.817	0.881	0.904	0.886	0.990	0.947	0.966	0.977	0.857	0.977
STRATFORD-007 (3969)	OZONE	0.189	0.168	0.168	0.164	0.154	0.153	0.147	0.145	0.138	0.131
	DATE	8/15/85	8/14/85	7/10/85	7/30/85	7/19/85	7/20/85	7/ 9/85	6/ 3/85	9/20/85	6/22/85
METEOROLOGICAL SITE	DIR (DEG)	230	230	230	290	210	250	170	320	220	190
NEWARK	VEL (MPH)	11.0	6.1	8.7	6.0	9.5	9.1	2.6	3.1	8.2	8.5
	SPD (MPH)	11.4	9.5	9.8	9.9	9.9	9.8	6.6	8.2	8.3	9.1
	RATIO	0.968	0.645	0.885	0.609	0.955	0.933	0.395	0.373	0.981	0.942
METEOROLOGICAL SITE	DIR (DEG)	210	210	200	290	220	290	190	340	200	190
BRADLEY	VEL (MPH)	5.9	1.7	5.9	4.4	6.9	5.5	3.8	1.8	3.8	5.1
	SPD (MPH)	6.5	4.7	7.2	6.0	7.6	7.2	5.0	4.0	5.0	5.2
	RATIO	0.907	0.367	0.821	0.723	0.906	0.761	0.759	0.457	0.758	0.989
METEOROLOGICAL SITE	DIR (DEG)	220	220	210	260	230	230	130	210	220	150
BRIDGEPORT	VEL (MPH)	8.1	6.8	5.6	6.3	8.6	7.8	4.6	5.7	6.5	4.2
	SPD (MPH)	8.5	7.3	5.9	7.9	9.1	7.9	5.6	6.3	6.8	7.5
	RATIO	0.950	0.922	0.956	0.792	0.948	0.982	0.824	0.907	0.964	0.564
METEOROLOGICAL SITE	DIR (DEG)	250	260	220	280	240	270	220	270	240	230
WORCESTER	VEL (MPH)	6.8	8.6	7.7	5.0	9.1	11.6	5.3	11.1	8.0	5.5
	SPD (MPH)	8.3	9.5	7.8	7.5	9.3	11.8	6.2	11.6	8.2	6.5
	RATIO	0.817	0.907	0.989	0.674	0.977	0.983	0.857	0.950	0.977	0.857

FIGURE 7

WIND ROSE FOR APRIL - SEPTEMBER 1984
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

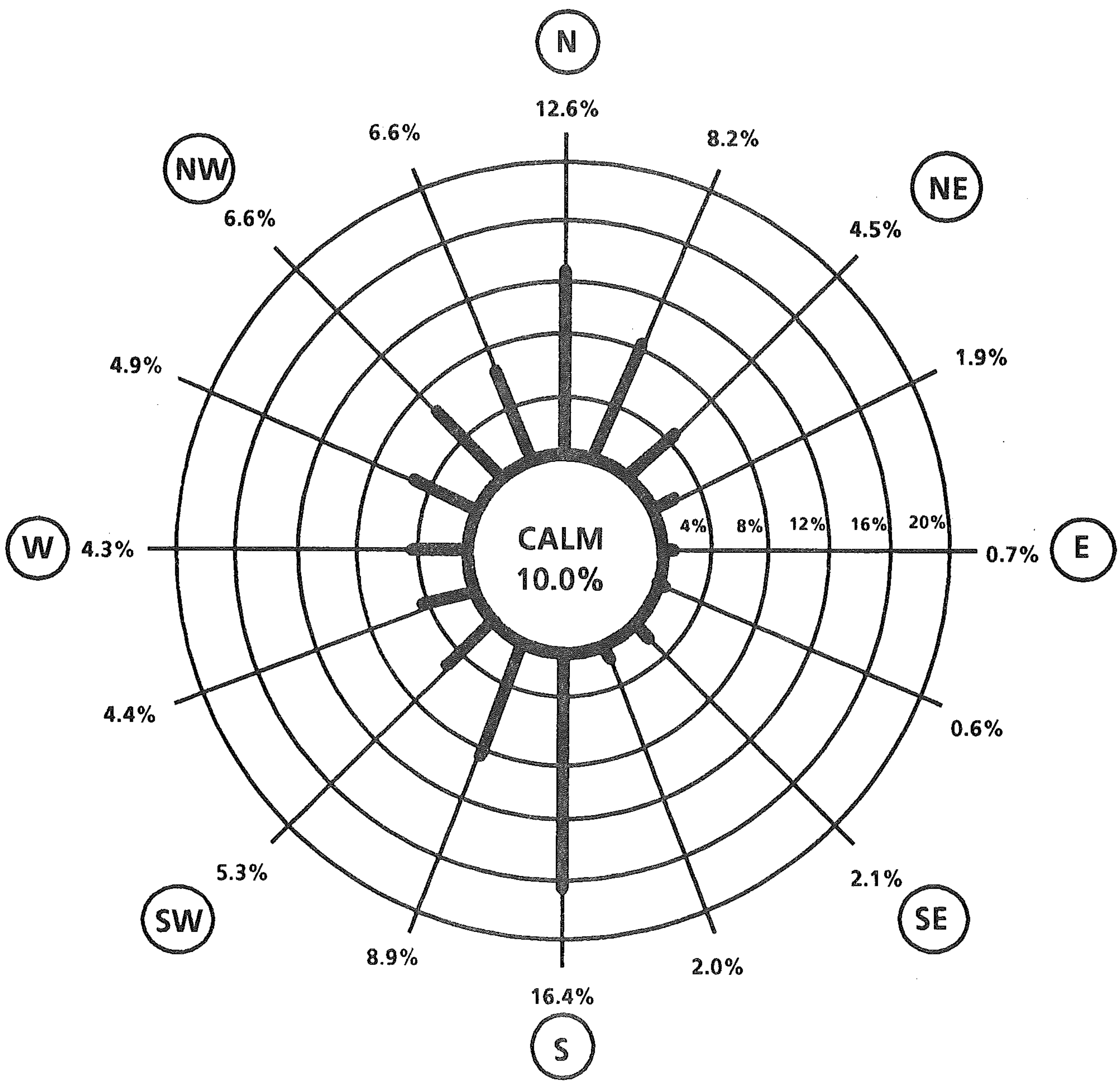


FIGURE 8

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

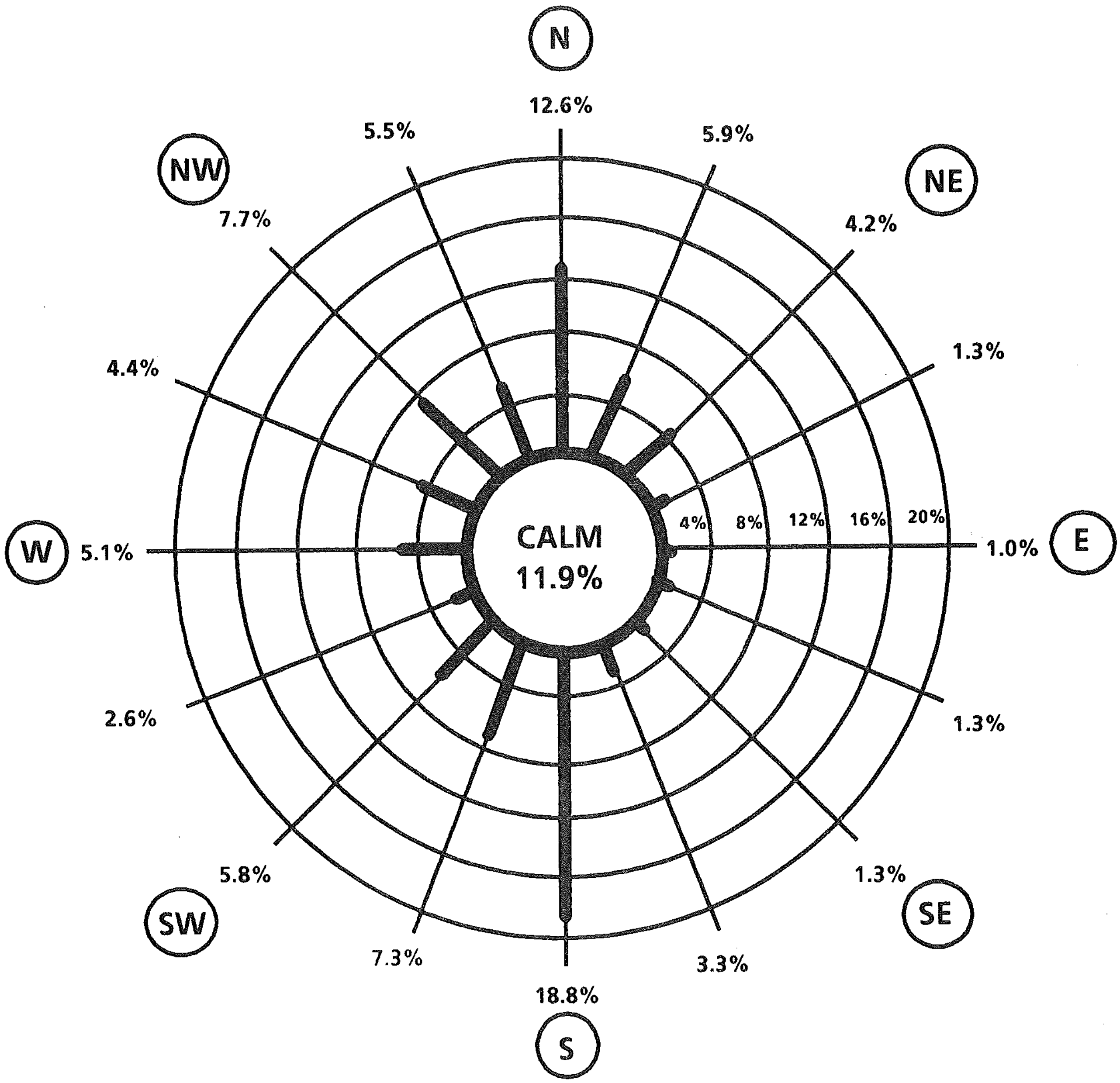


FIGURE 9

WIND ROSE FOR APRIL - SEPTEMBER 1984
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY

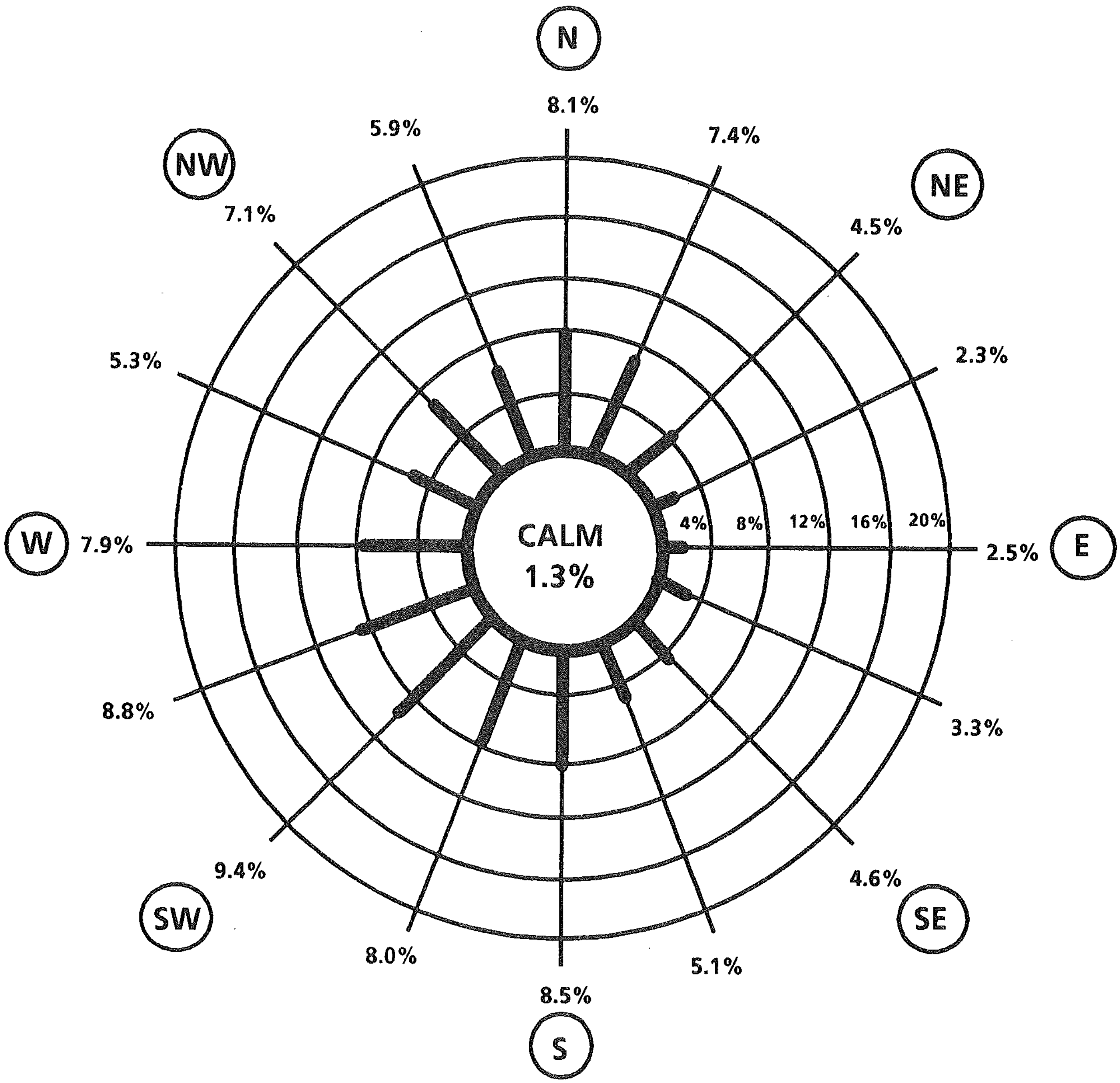
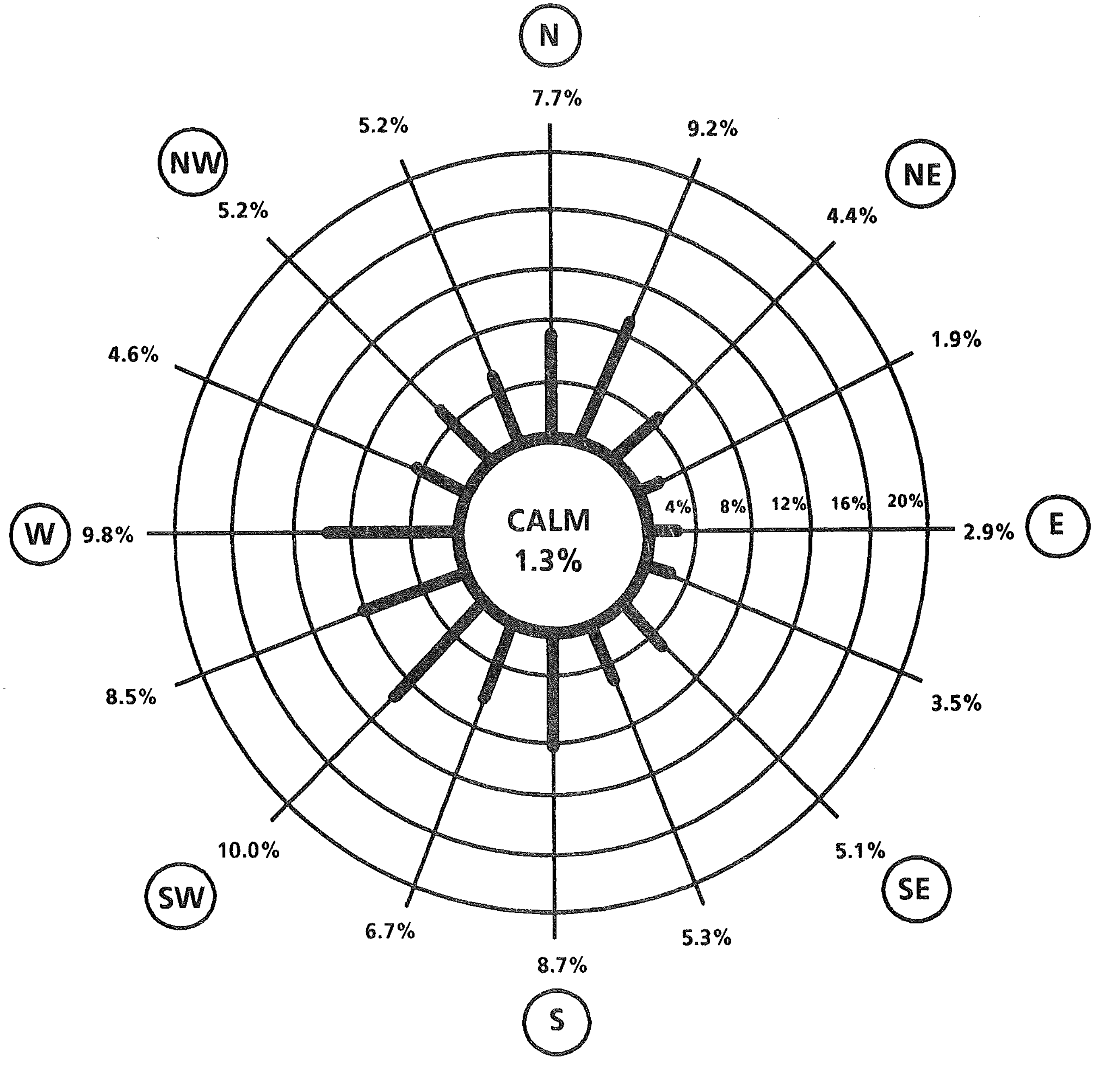


FIGURE 10

WIND ROSE FOR APRIL - SEPTEMBER 1985
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 1985. 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. This was the fourth year this type of analyzer was used to measure NO_2 levels.

DISCUSSION OF DATA

Monitoring Network - There were three nitrogen dioxide monitoring sites in 1985 (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 - Forty-two precision checks were made on the NO_2 monitors in 1985, yielding 95% probability limits ranging from -10% to +10%. Accuracy is determined by introducing a known amount of NO_2 into each of the monitors. Five audits for accuracy were conducted on the monitoring network in 1985. 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 -15% to +12%; those for the low/medium level test ranged from -8% to +3%; those for the medium/high level test ranged from -8% to +2%; and those for the high level test ranged from -9% to +2%.

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 and 1982 can be found in the 1983 Air Quality Summary. Data for 1983-1985 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 1985 at any site in Connecticut (see Table 22). In 1985, all three sites had sufficient data to compute valid arithmetic means. This permits comparisons with the 1983 and 1984 annual averages. The arithmetic mean NO_2 concentration at each site decreased between 1983 and 1985.

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 1985.

10-High Days with Wind Data - Table 23 presents for each site the ten days in 1985 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, 16 of the 23 days listed in the table had more then 50% of the possible sunshine. Of the seven remaining days, three followed days when the percent of possible sunshine exceeded 72%. This is interpreted to confirm the importance of photochemical oxidation in the formation of NO_2.

Six of the high NO_2 days occurred at 2 or more of the sites, and four of these days had persistent winds out of the southwest quadrant. Persistent southwest winds were also characteristic of 63% 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 persistent southwest winds) tend to produce high NO_2 levels in Connecticut.

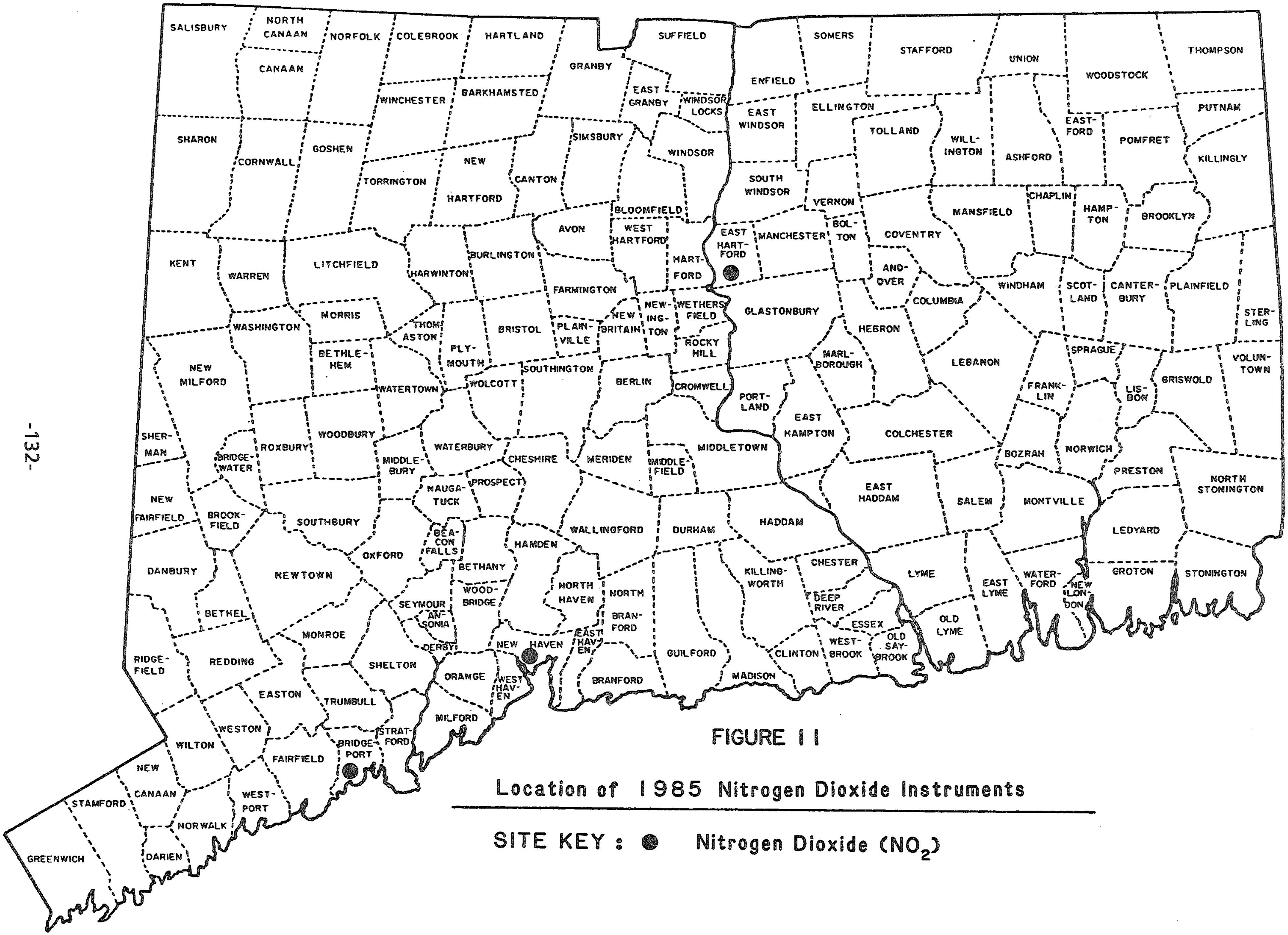


FIGURE 11

Location of 1985 Nitrogen Dioxide Instruments

SITE KEY : ● Nitrogen Dioxide (NO_2)

TABLE 22

1983 -1985 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	1983	8328	56.4	56.2	56.6	34.7
Bridgeport	123	1984	8689	51.5	51.4	51.6	29.7
Bridgeport	123	1985	8602	50.3	50.2	50.4	26.8
East Hartford	003	1983	8576	43.5	43.4	43.6	31.3
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
New Haven	123	1983	7971	62.8	62.7	62.9	13.5
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

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

TABLE 23

1985 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 (8602)	NO2	0.104	0.097	0.090	0.088	0.087	0.085	0.085	0.084	0.084	0.083
	DATE	4/16/85	9/ 2/85	6/18/85	5/ 1/85	4/25/85	10/10/85	8/15/85	3/27/85	4/21/85	8/10/85
METEOROLOGICAL SITE	DIR (DEG)	300	230	230	300	320	240	230	220	160	160
NEWARK	VEL (MPH)	7.2	6.4	9.1	3.2	5.4	13.0	11.0	10.5	4.4	3.7
	SPD (MPH)	10.5	7.9	10.2	9.6	8.9	13.7	11.4	10.9	6.6	7.2
	RATIO	0.686	0.809	0.894	0.335	0.604	0.955	0.968	0.961	0.658	0.514
METEOROLOGICAL SITE	DIR (DEG)	300	200	190	10	200	230	210	190	170	180
BRADLEY	VEL (MPH)	4.7	3.7	8.1	5.4	2.3	5.0	5.9	5.7	4.6	2.7
	SPD (MPH)	6.0	4.5	8.2	7.5	6.5	9.1	6.5	5.8	5.8	6.0
	RATIO	0.780	0.829	0.989	0.717	0.359	0.553	0.907	0.993	0.797	0.448
METEOROLOGICAL SITE	DIR (DEG)	270	240	220	280	230	240	220	220	90	150
BRIDGEPORT	VEL (MPH)	7.1	7.1	6.7	2.9	3.3	9.3	8.1	8.2	2.7	2.6
	SPD (MPH)	11.1	7.5	7.0	8.6	5.3	9.5	8.5	8.5	7.3	4.6
	RATIO	0.639	0.952	0.946	0.341	0.620	0.978	0.950	0.966	0.365	0.571
METEOROLOGICAL SITE	DIR (DEG)	280	240	210	290	250	250	250	240	200	230
WORCESTER	VEL (MPH)	8.0	7.8	7.4	9.5	11.0	9.6	6.8	7.2	1.9	3.6
	SPD (MPH)	11.1	8.6	7.8	11.9	11.5	10.1	8.3	9.1	8.6	5.6
	RATIO	0.726	0.901	0.950	0.793	0.955	0.955	0.817	0.798	0.220	0.644
EAST HARTFORD-003 (8461)	NO2	0.080	0.074	0.070	0.070	0.069	0.066	0.066	0.066	0.066	0.065
	DATE	9/19/85	3/27/85	2/ 5/85	3/11/85	12/24/85	10/23/85	3/19/85	10/ 9/85	4/30/85	9/20/85
METEOROLOGICAL SITE	DIR (DEG)	210	220	40	180	190	60	270	230	260	220
NEWARK	VEL (MPH)	4.5	10.5	7.9	4.2	2.5	5.9	6.9	10.5	7.5	8.2
	SPD (MPH)	5.0	10.9	8.9	6.5	3.2	9.6	11.2	10.8	10.2	8.3
	RATIO	0.901	0.961	0.884	0.655	0.789	0.613	0.613	0.976	0.738	0.981
METEOROLOGICAL SITE	DIR (DEG)	250	190	30	180	190	30	220	210	250	200
BRADLEY	VEL (MPH)	1.2	5.7	2.6	7.6	1.7	0.8	1.0	6.8	3.9	3.8
	SPD (MPH)	2.9	5.8	3.6	7.8	5.6	1.6	6.0	7.0	6.5	5.0
	RATIO	0.419	0.993	0.712	0.978	0.296	0.480	0.164	0.962	0.609	0.758
METEOROLOGICAL SITE	DIR (DEG)	220	220	60	110	140	60	250	240	230	220
BRIDGEPORT	VEL (MPH)	4.5	8.2	11.5	4.6	2.0	5.4	8.1	8.6	9.1	6.5
	SPD (MPH)	4.6	8.5	11.8	7.3	5.0	6.2	10.9	9.1	9.5	6.8
	RATIO	0.981	0.966	0.979	0.633	0.398	0.866	0.745	0.952	0.960	0.964
METEOROLOGICAL SITE	DIR (DEG)	270	240	90	240	190	70	290	230	250	240
WORCESTER	VEL (MPH)	6.9	7.2	0.8	9.0	5.6	1.3	7.0	12.8	14.3	8.0
	SPD (MPH)	7.5	9.1	5.9	10.8	6.8	5.2	10.1	12.9	14.5	8.2
	RATIO	0.917	0.798	0.138	0.834	0.833	0.247	0.691	0.986	0.986	0.977
NEW HAVEN-123 (8566)	NO2	0.112	0.104	0.102	0.096	0.092	0.088	0.088	0.088	0.087	0.084
	DATE	3/27/85	5/ 1/85	9/19/85	9/21/85	9/20/85	7/13/85	4/16/85	4/19/85	12/24/85	3/28/85
METEOROLOGICAL SITE	DIR (DEG)	220	300	210	240	220	130	300	260	190	250
NEWARK	VEL (MPH)	10.5	3.2	4.5	8.4	8.2	4.2	7.2	8.4	2.5	11.2
	SPD (MPH)	10.9	9.6	5.0	8.9	8.3	6.5	10.5	11.4	3.2	11.9
	RATIO	0.961	0.335	0.901	0.939	0.981	0.652	0.686	0.735	0.789	0.942
METEOROLOGICAL SITE	DIR (DEG)	190	10	250	210	200	260	300	340	190	250
BRADLEY	VEL (MPH)	5.7	5.4	1.2	3.8	3.8	1.4	4.7	3.2	1.7	8.8
	SPD (MPH)	5.8	7.5	2.9	4.9	5.0	2.7	6.0	4.5	5.6	11.2
	RATIO	0.993	0.717	0.419	0.769	0.758	0.506	0.780	0.717	0.296	0.784

TABLE 23, CONTINUED

1985 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)	220	280	220	240	220	200	270	180	140	230
BRIDGEPORT	VEL (MPH)	8.2	2.9	4.5	7.7	6.5	3.7	7.1	3.1	2.0	8.8
	SPD (MPH)	8.5	8.6	4.6	7.9	6.8	5.3	11.1	7.2	5.0	9.5
	RATIO	0.966	0.341	0.981	0.978	0.964	0.698	0.639	0.438	0.398	0.929
METEOROLOGICAL SITE	DIR (DEG)	240	290	270	250	240	270	280	300	190	250
WORCESTER	VEL (MPH)	7.2	9.5	6.9	8.5	8.0	6.0	8.0	5.6	5.6	14.6
	SPD (MPH)	9.1	11.9	7.5	8.8	8.2	6.3	11.1	10.5	6.8	15.2
	RATIO	0.798	0.793	0.917	0.966	0.977	0.942	0.726	0.534	0.833	0.959

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 ~~three~~ two of the five carbon monoxide monitoring sites in Connecticut during 1985. The standard was exceeded ~~two~~ one times at Stamford 020, ~~six~~ five times at Hartford 017 ~~and once at Bridgeport 004~~. No exceedance of the 35 ppm one-hour standard was measured at any site in 1985.

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 1985 consisted of five carbon monoxide monitors: Bridgeport 004, Hartford 017, New Britain 002, New Haven 007, and Stamford 020. They are all located in urban areas. All sites are located west of the Connecticut River, with three of them in coastal towns (see Figure 12). Hartford 017 is a relatively new site and has been in existence for only two years.

Precision and Accuracy - The carbon monoxide monitors had a total of 141 precision checks during 1985. The resulting 95% probability limits were -9% to +9%. Accuracy is determined by introducing a known amount of CO into each of the monitors. Six audits for accuracy were conducted on the monitoring network in 1985. Three different concentration levels were tested on each monitor: low, medium and high. The 95% probability limits for the low level test ranged from -4% to +12%; for the medium level test ranged from -4% to +4%; and for the high level test ranged from -1% to +2%.

HARTFORD 017 AND STAMFORD 020

8-Hour and 1-Hour Averages - Hartford 017 ~~and Stamford 020~~ had second high CO concentrations exceeding the 8-hour standard of 9 ppm, which means that the standard was violated at these sites in 1985 (see Table 24). In 1984, both ~~sites also~~ recorded violations of the standard. Regarding the maximum 8-hour running average at each site, there were decreases from 1984 to 1985 at Hartford, New Britain and Stamford. Increases occurred at Bridgeport and New Haven. The second highest values were higher in 1985 than in 1984 at Hartford and New Haven and lower at Bridgeport, New Britain 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 Stamford 020 recorded a maximum 1-hour value greater than the year before. Second high 1-hour values were lower at all the sites.

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 1985 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 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 has dropped significantly at the Stamford site and has remained low and relatively unchanged at the Bridgeport, New Britain and New Haven sites. The Hartford-017 site has been in existence for only two years. Little can be said about the trend at this site. Therefore, it is included in Table 26a but not in Figure 13. The Stamford-020 site is excluded from Figure 13 because the range of the number of exceedances is too large to illustrate satisfactorily.

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 four sites. The Hartford-017 site is not included due to the lack of sufficient data. CO levels seem to be remaining steady at all the sites except Stamford-020, where a downward trend is apparent.

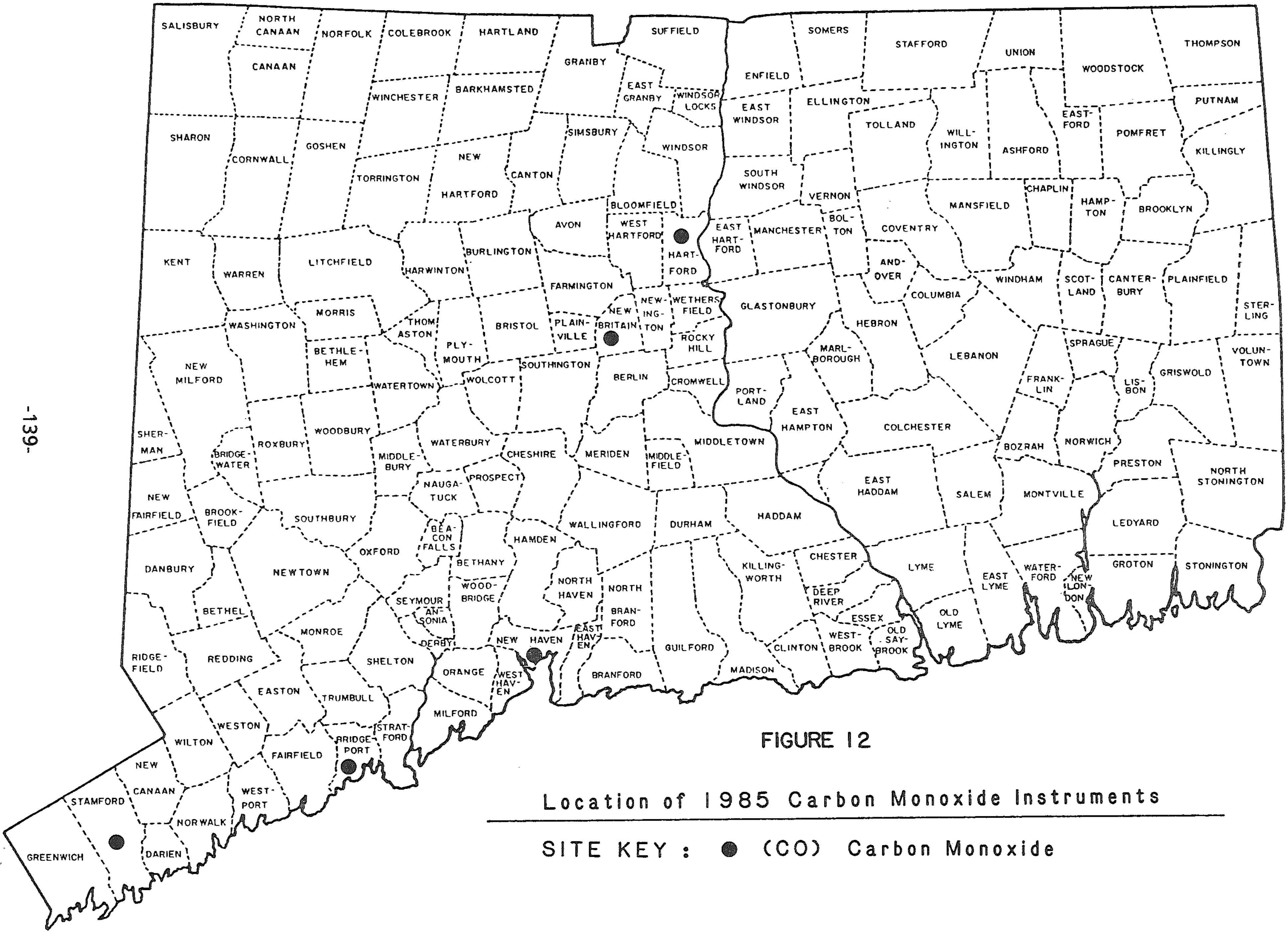


FIGURE 12

Location of 1985 Carbon Monoxide Instruments

SITE KEY : ● (CO) Carbon Monoxide

TABLE 24

1985 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	9.2	12/24/1	7.2	1/14/22	12.2	12/23/23	11.7	11/19/9
Hartford-017	12.2	1/14/24	11.9	12/24/15	20.9	1/14/18	16.9	12/24/14
New Britain-002	7.0	12/1/24	6.5	2/1/18	12.0	12/24/10	10.7	12/24/11
New Haven-007	7.7	12/24/1	6.7	1/14/23	13.2	7/15/9	9.2	12/24/1
Stamford-020	10.2	1/14/22	9.3	12/24/1	20.0	1/14/19	17.1 ~~15.3~~	1/28/8 ~~1/14/18~~

[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.

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

TABLE 25

1985 CARBON MONOXIDE SEASONAL FEATURES

TOWN-SITE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Bridgeport-004	Max. 1-Hour	11.1	7.7	7.0	5.8	4.9	2.6	4.1	5.0	7.7	9.0	11.7	12.2
	Max. Running 8-Hour	7.2	5.0	4.4	3.9	3.9	2.2	3.1	3.1	4.4	4.4	6.3	9.2
	No. of 8-Hour Exceedances	0	0	0	0	0	0	0	0	0	0	0	~~1~~ 0
Hartford-017	Max. 1-Hour	20.9	16.6	10.9	11.1	11.1	5.9	11.6	9.4	11.0	13.3	13.1	16.9
	Max. Running 8-Hour	12.2	9.4	8.4	7.5	5.3	4.5	6.6	7.2	7.8	8.2	7.6	11.9
	No. of 8-Hour Exceedances	1	~~1~~ 0	0	0	0	0	0	0	0	0	0	4
New Britain-002	Max. 1-Hour	9.5	9.8	9.9	5.4	4.8	5.0	7.8	7.4	8.4	7.6	9.6	12.0
	Max. Running 8-Hour	6.4	6.5	4.8	4.2	3.6	3.6	5.7	5.1	4.4	5.3	7.0	6.5
	No. of 8-Hour Exceedances	0	0	0	0	0	0	0	0	0	0	0	0
New Haven-007	Max. 1-Hour	8.7	7.3	6.8	6.4	4.1	4.8	13.2	5.1	6.3	6.8	9.0	9.2
	Max. Running 8-Hour	6.7	3.8	4.0	3.0	2.7	2.8	2.7	3.7	3.3	4.1	5.0	7.7
	No. of 8-Hour Exceedances	0	0	0	0	0	0	0	0	0	0	0	0
Stamford-020	Max. 1-Hour	20.0	15.0	8.0	8.3	5.3	6.2	4.8	7.6	7.4	9.8	11.8	12.3
	Max. Running 8-Hour	10.2	6.6	5.9	4.3	3.7	4.1	3.8	4.2	4.7	5.2	7.3	9.3
	No. of 8-Hour Exceedances	1	0	0	0	0	0	0	0	0	0	0	~~1~~ 0

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

TABLE 26

1985 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 (8673)	CO	12.2	11.7	11.1	10.8	9.1	9.0	8.7	8.4	7.7	7.7
	DATE	12/23/85	11/19/85	1/14/85	12/24/85	11/18/85	10/18/85	10/ 1/85	11/ 1/85	2/20/85	9/30/85
METEOROLOGICAL SITE	DIR (DEG)	190	210	240	190	250	210	210	50	330	210
NEWARK	VEL (MPH)	6.4	4.0	8.0	2.5	5.3	6.8	5.9	10.7	7.0	8.4
	SPD (MPH)	7.0	6.6	8.8	3.2	8.2	8.5	7.2	11.8	8.3	8.6
	RATIO	0.909	0.605	0.911	0.789	0.643	0.808	0.825	0.909	0.843	0.972
METEOROLOGICAL SITE	DIR (DEG)	190	200	240	190	290	190	200	20	340	210
BRADLEY	VEL (MPH)	6.4	4.6	3.9	1.7	4.5	6.3	7.4	4.5	5.6	5.2
	SPD (MPH)	6.9	4.9	4.9	5.6	4.7	6.9	7.6	4.7	6.3	5.8
	RATIO	0.932	0.938	0.803	0.296	0.956	0.916	0.966	0.939	0.884	0.905
METEOROLOGICAL SITE	DIR (DEG)	250	230	250	140	250	220	210	40	300	220
BRIDGEPORT	VEL (MPH)	9.2	5.1	6.3	2.0	3.0	7.0	4.1	5.8	2.8	6.2
	SPD (MPH)	9.5	5.2	7.5	5.0	4.9	8.6	5.6	8.6	5.6	6.9
	RATIO	0.972	0.992	0.844	0.398	0.622	0.815	0.737	0.671	0.497	0.898
METEOROLOGICAL SITE	DIR (DEG)	230	220	270	190	260	210	210	30	320	230
WORCESTER	VEL (MPH)	10.4	11.7	6.9	5.6	4.6	10.1	8.0	4.0	8.3	9.9
	SPD (MPH)	10.5	11.8	8.1	6.8	4.7	10.6	8.2	4.6	8.6	10.2
	RATIO	0.989	0.992	0.857	0.833	0.964	0.950	0.973	0.864	0.960	0.974
HARTFORD-017 (8127)	CO	20.9	16.9	16.6	16.4	16.4	14.4	14.4	14.4	14.1	14.1
	DATE	1/14/85	12/24/85	2/ 4/85	2/11/85	12/23/85	1/28/85	1/17/85	2/ 5/85	1/11/85	1/18/85
METEOROLOGICAL SITE	DIR (DEG)	240	190	280	50	190	300	220	40	350	230
NEWARK	VEL (MPH)	8.0	2.5	7.4	4.3	6.4	6.8	6.4	7.9	10.6	3.8
	SPD (MPH)	8.8	3.2	8.2	6.9	7.0	9.3	8.1	8.9	11.9	5.2
	RATIO	0.911	0.789	0.907	0.627	0.909	0.723	0.789	0.884	0.891	0.735
METEOROLOGICAL SITE	DIR (DEG)	240	190	320	350	190	320	300	30	350	200
BRADLEY	VEL (MPH)	3.9	1.7	4.3	1.7	6.4	3.3	0.3	2.6	4.9	1.9
	SPD (MPH)	4.9	5.6	6.5	3.7	6.9	3.3	3.6	3.6	5.3	2.7
	RATIO	0.803	0.296	0.665	0.461	0.932	0.983	0.090	0.712	0.918	0.693
METEOROLOGICAL SITE	DIR (DEG)	250	140	250	60	250	300	40	60	340	210
BRIDGEPORT	VEL (MPH)	6.3	2.0	5.1	5.9	9.2	6.0	2.1	11.5	9.5	6.8
	SPD (MPH)	7.5	5.0	6.6	6.9	9.5	7.3	5.6	11.8	10.2	7.3
	RATIO	0.844	0.398	0.765	0.859	0.972	0.813	0.366	0.979	0.930	0.932
METEOROLOGICAL SITE	DIR (DEG)	270	190	290	50	230	300	310	90	330	300
WORCESTER	VEL (MPH)	6.9	5.6	7.1	0.9	10.4	9.5	1.8	0.8	11.2	7.3
	SPD (MPH)	8.1	6.8	7.8	5.0	10.5	10.1	4.9	5.9	11.6	8.2
	RATIO	0.857	0.833	0.921	0.181	0.989	0.945	0.365	0.138	0.963	0.891
NEW BRITAIN-002 (7883)	CO	12.0	9.9	9.8	9.6	9.6	9.5	9.1	9.1	8.4	8.3
	DATE	12/24/85	3/11/85	2/ 5/85	11/18/85	2/15/85	1/ 2/85	11/ 1/85	2/ 1/85	9/30/85	1/ 7/85
METEOROLOGICAL SITE	DIR (DEG)	190	180	40	250	260	330	50	20	210	40
NEWARK	VEL (MPH)	2.5	4.2	7.9	5.3	9.4	8.0	10.7	10.7	8.4	2.8
	SPD (MPH)	3.2	6.5	8.9	8.2	9.9	9.6	11.8	10.8	8.6	6.6
	RATIO	0.789	0.655	0.884	0.643	0.946	0.827	0.909	0.996	0.972	0.417
METEOROLOGICAL SITE	DIR (DEG)	190	180	30	290	240	350	20	20	210	10
BRADLEY	VEL (MPH)	1.7	7.6	2.6	4.5	5.5	5.2	4.5	5.9	5.2	6.8
	SPD (MPH)	5.6	7.8	3.6	4.7	6.2	5.3	4.7	6.0	5.8	7.5
	RATIO	0.296	0.978	0.712	0.956	0.889	0.971	0.939	0.981	0.905	0.910

TABLE 26, CONTINUED

1985 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)	140	110	60	250	260	330	40	20	220	40
BRIDGEPORT	VEL (MPH)	2.0	4.6	11.5	3.0	9.5	6.5	5.8	8.8	6.2	9.6
	SPD (MPH)	5.0	7.3	11.8	4.9	10.4	8.1	8.6	9.2	6.9	11.1
	RATIO	0.398	0.633	0.979	0.622	0.920	0.806	0.671	0.952	0.898	0.870
METEOROLOGICAL SITE	DIR (DEG)	190	240	90	260	260	330	30	60	230	70
WORCESTER	VEL (MPH)	5.6	9.0	0.8	4.6	8.2	6.2	4.0	5.0	9.9	7.9
	SPD (MPH)	6.8	10.8	5.9	4.7	8.5	7.3	4.6	5.2	10.2	8.1
	RATIO	0.833	0.834	0.138	0.964	0.971	0.847	0.864	0.974	0.974	0.985
NEW HAVEN-007 (8698)	CO	13.2	9.2	9.0	8.7	8.5	7.3	7.3	7.2	7.0	6.8
	DATE	7/15/85	12/24/85	11/19/85	1/14/85	12/23/85	2/ 4/85	11/ 1/85	1/ 4/85	12/31/85	10/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	190	190	210	240	190	280	50	360	210	210
NEWARK	VEL (MPH)	6.3	2.5	4.0	8.0	6.4	7.4	10.7	7.2	9.5	5.9
	SPD (MPH)	7.6	3.2	6.6	8.8	7.0	8.2	11.8	8.1	10.2	7.2
	RATIO	0.831	0.789	0.605	0.911	0.909	0.907	0.909	0.896	0.930	0.825
METEOROLOGICAL SITE	DIR (DEG)	190	190	200	240	190	320	20	10	190	200
BRADLEY	VEL (MPH)	9.9	1.7	4.6	3.9	6.4	4.3	4.5	1.0	9.0	7.4
	SPD (MPH)	10.2	5.6	4.9	4.9	6.9	6.5	4.7	1.9	9.2	7.6
	RATIO	0.970	0.296	0.938	0.803	0.932	0.665	0.939	0.558	0.983	0.966
METEOROLOGICAL SITE	DIR (DEG)	200	140	230	250	250	250	40	20	210	210
BRIDGEPORT	VEL (MPH)	7.4	2.0	5.1	6.3	9.2	5.1	5.8	2.0	12.0	4.1
	SPD (MPH)	7.8	5.0	5.2	7.5	9.5	6.6	8.6	4.7	12.9	5.6
	RATIO	0.951	0.398	0.992	0.844	0.972	0.765	0.671	0.420	0.925	0.737
METEOROLOGICAL SITE	DIR (DEG)	220	190	220	270	230	290	30	250	210	210
WORCESTER	VEL (MPH)	12.6	5.6	11.7	6.9	10.4	7.1	4.0	1.9	15.5	8.0
	SPD (MPH)	13.4	6.8	11.8	8.1	10.5	7.8	4.6	4.0	15.5	8.2
	RATIO	0.944	0.833	0.992	0.857	0.989	0.921	0.864	0.463	0.996	0.973
STAMFORD-020 (8697)	CO	20.0	17.1	15.0	12.3	11.8	10.6	10.2	9.9	9.8	9.5
	DATE	1/14/85	1/28/85	2/11/85	12/23/85	11/18/85	11/19/85	12/24/85	1/24/85	10/18/85	11/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	240	300	50	190	250	210	190	250	210	50
NEWARK	VEL (MPH)	8.0	6.8	4.3	6.4	5.3	4.0	2.5	12.0	6.8	10.7
	SPD (MPH)	8.8	9.3	6.9	7.0	8.2	6.6	3.2	12.7	8.5	11.8
	RATIO	0.911	0.723	0.627	0.909	0.643	0.605	0.789	0.947	0.808	0.909
METEOROLOGICAL SITE	DIR (DEG)	240	320	350	190	290	200	190	220	190	20
BRADLEY	VEL (MPH)	3.9	3.3	1.7	6.4	4.5	4.6	1.7	4.7	6.3	4.5
	SPD (MPH)	4.9	3.3	3.7	6.9	4.7	4.9	5.6	6.0	6.9	4.7
	RATIO	0.803	0.983	0.461	0.932	0.956	0.938	0.296	0.786	0.916	0.939
METEOROLOGICAL SITE	DIR (DEG)	250	300	60	250	250	230	140	250	220	40
BRIDGEPORT	VEL (MPH)	6.3	6.0	5.9	9.2	3.0	5.1	2.0	11.2	7.0	5.8
	SPD (MPH)	7.5	7.3	6.9	9.5	4.9	5.2	5.0	11.4	8.6	8.6
	RATIO	0.844	0.813	0.859	0.972	0.622	0.992	0.398	0.987	0.815	0.671
METEOROLOGICAL SITE	DIR (DEG)	270	300	50	230	260	220	190	290	210	30
WORCESTER	VEL (MPH)	6.9	9.5	0.9	10.4	4.6	11.7	5.6	11.9	10.1	4.0
	SPD (MPH)	8.1	10.1	5.0	10.5	4.7	11.8	6.8	12.1	10.6	4.6
	RATIO	0.857	0.945	0.181	0.989	0.964	0.992	0.833	0.982	0.950	0.864

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TABLE 26

1985 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 (8673)	CO	12.2	11.7	11.1	10.8	9.1	9.0	8.7	8.4	7.7	7.7
	DATE	12/23/85	11/19/85	1/14/85	12/24/85	11/18/85	10/18/85	10/ 1/85	11/ 1/85	2/20/85	9/30/85
METEOROLOGICAL SITE	DIR (DEG)	190	210	240	190	250	210	210	50	330	210
NEWARK	VEL (MPH)	6.4	4.0	8.0	2.5	5.3	6.8	5.9	10.7	7.0	8.4
	SPD (MPH)	7.0	6.6	8.8	3.2	8.2	8.5	7.2	11.8	8.3	8.6
	RATIO	0.909	0.605	0.911	0.789	0.643	0.808	0.825	0.909	0.843	0.972
METEOROLOGICAL SITE	DIR (DEG)	190	200	240	190	290	190	200	20	340	210
BRADLEY	VEL (MPH)	6.4	4.6	3.9	1.7	4.5	6.3	7.4	4.5	5.6	5.2
	SPD (MPH)	6.9	4.9	4.9	5.6	4.7	6.9	7.6	4.7	6.3	5.8
	RATIO	0.932	0.938	0.803	0.296	0.956	0.916	0.966	0.939	0.884	0.905
METEOROLOGICAL SITE	DIR (DEG)	250	230	250	140	250	220	210	40	300	220
BRIDGEPORT	VEL (MPH)	9.2	5.1	6.3	2.0	3.0	7.0	4.1	5.8	2.8	6.2
	SPD (MPH)	9.5	5.2	7.5	5.0	4.9	8.6	5.6	8.6	5.6	6.9
	RATIO	0.972	0.992	0.844	0.398	0.622	0.815	0.737	0.671	0.497	0.898
METEOROLOGICAL SITE	DIR (DEG)	230	220	270	190	260	210	210	30	320	230
WORCESTER	VEL (MPH)	10.4	11.7	6.9	5.6	4.6	10.1	8.0	4.0	8.3	9.9
	SPD (MPH)	10.5	11.8	8.1	6.8	4.7	10.6	8.2	4.6	8.6	10.2
	RATIO	0.989	0.992	0.857	0.833	0.964	0.950	0.973	0.864	0.960	0.974
HARTFORD-017 (8127)	CO	20.9	16.9	16.6	16.4	16.4	14.4	14.4	14.4	14.1	14.1
	DATE	1/14/85	12/24/85	2/ 4/85	2/11/85	12/23/85	1/28/85	1/17/85	2/ 5/85	1/11/85	1/18/85
METEOROLOGICAL SITE	DIR (DEG)	240	190	280	50	190	300	220	40	350	230
NEWARK	VEL (MPH)	8.0	2.5	7.4	4.3	6.4	6.8	6.4	7.9	10.6	3.8
	SPD (MPH)	8.8	3.2	8.2	6.9	7.0	9.3	8.1	8.9	11.9	5.2
	RATIO	0.911	0.789	0.907	0.627	0.909	0.723	0.789	0.884	0.891	0.735
METEOROLOGICAL SITE	DIR (DEG)	240	190	320	350	190	320	300	30	350	200
BRADLEY	VEL (MPH)	3.9	1.7	4.3	1.7	6.4	3.3	0.3	2.6	4.9	1.9
	SPD (MPH)	4.9	5.6	6.5	3.7	6.9	3.3	3.6	3.6	5.3	2.7
	RATIO	0.803	0.296	0.665	0.461	0.932	0.983	0.090	0.712	0.918	0.693
METEOROLOGICAL SITE	DIR (DEG)	250	140	250	60	250	300	40	60	340	210
BRIDGEPORT	VEL (MPH)	6.3	2.0	5.1	5.9	9.2	6.0	2.1	11.5	9.5	6.8
	SPD (MPH)	7.5	5.0	6.6	6.9	9.5	7.3	5.6	11.8	10.2	7.3
	RATIO	0.844	0.398	0.765	0.859	0.972	0.813	0.366	0.979	0.930	0.932
METEOROLOGICAL SITE	DIR (DEG)	270	190	290	50	230	300	310	90	330	300
WORCESTER	VEL (MPH)	6.9	5.6	7.1	0.9	10.4	9.5	1.8	0.8	11.2	7.3
	SPD (MPH)	8.1	6.8	7.8	5.0	10.5	10.1	4.9	5.9	11.6	8.2
	RATIO	0.857	0.833	0.921	0.181	0.989	0.945	0.365	0.138	0.963	0.891
NEW BRITAIN-002 (7883)	CO	12.0	9.9	9.8	9.6	9.6	9.5	9.1	9.1	8.4	8.3
	DATE	12/24/85	3/11/85	2/ 5/85	11/18/85	2/15/85	1/ 2/85	11/ 1/85	2/ 1/85	9/30/85	1/ 7/85
METEOROLOGICAL SITE	DIR (DEG)	190	180	40	250	260	330	50	20	210	40
NEWARK	VEL (MPH)	2.5	4.2	7.9	5.3	9.4	8.0	10.7	10.7	8.4	2.8
	SPD (MPH)	3.2	6.5	8.9	8.2	9.9	9.6	11.8	10.8	8.6	6.6
	RATIO	0.789	0.655	0.884	0.643	0.946	0.827	0.909	0.996	0.972	0.417
METEOROLOGICAL SITE	DIR (DEG)	190	180	30	290	240	350	20	20	210	10
BRADLEY	VEL (MPH)	1.7	7.6	2.6	4.5	5.5	5.2	4.5	5.9	5.2	6.8
	SPD (MPH)	5.6	7.8	3.6	4.7	6.2	5.3	4.7	6.0	5.8	7.5
	RATIO	0.296	0.978	0.712	0.956	0.889	0.971	0.939	0.981	0.905	0.910

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TABLE 26, CONTINUED

1985 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)	140	110	60	250	260	330	40	20	220	40
BRIDGEPORT	VEL (MPH)	2.0	4.6	11.5	3.0	9.5	6.5	5.8	8.8	6.2	9.6
	SPD (MPH)	5.0	7.3	11.8	4.9	10.4	8.1	8.6	9.2	6.9	11.1
	RATIO	0.398	0.633	0.979	0.622	0.920	0.806	0.671	0.952	0.898	0.870
METEOROLOGICAL SITE	DIR (DEG)	190	240	90	260	260	330	30	60	230	70
WORCESTER	VEL (MPH)	5.6	9.0	0.8	4.6	8.2	6.2	4.0	5.0	9.9	7.9
	SPD (MPH)	6.8	10.8	5.9	4.7	8.5	7.3	4.6	5.2	10.2	8.1
	RATIO	0.833	0.834	0.138	0.964	0.971	0.847	0.864	0.974	0.974	0.985
NEW HAVEN-007 (8698)	CO	13.2	9.2	9.0	8.7	8.5	7.3	7.3	7.2	7.0	6.8
	DATE	7/15/85	12/24/85	11/19/85	1/14/85	12/23/85	2/ 4/85	11/ 1/85	1/ 4/85	12/31/85	10/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	190	190	210	240	190	280	50	360	210	210
NEWARK	VEL (MPH)	6.3	2.5	4.0	8.0	6.4	7.4	10.7	7.2	9.5	5.9
	SPD (MPH)	7.6	3.2	6.6	8.8	7.0	8.2	11.8	8.1	10.2	7.2
	RATIO	0.831	0.789	0.605	0.911	0.909	0.907	0.909	0.896	0.930	0.825
METEOROLOGICAL SITE	DIR (DEG)	190	190	200	240	190	320	20	10	190	200
BRADLEY	VEL (MPH)	9.9	1.7	4.6	3.9	6.4	4.3	4.5	1.0	9.0	7.4
	SPD (MPH)	10.2	5.6	4.9	4.9	6.9	6.5	4.7	1.9	9.2	7.6
	RATIO	0.970	0.296	0.938	0.803	0.932	0.665	0.939	0.558	0.983	0.966
METEOROLOGICAL SITE	DIR (DEG)	200	140	230	250	250	250	40	20	210	210
BRIDGEPORT	VEL (MPH)	7.4	2.0	5.1	6.3	9.2	5.1	5.8	2.0	12.0	4.1
	SPD (MPH)	7.8	5.0	5.2	7.5	9.5	6.6	8.6	4.7	12.9	5.6
	RATIO	0.951	0.398	0.992	0.844	0.972	0.765	0.671	0.420	0.925	0.737
METEOROLOGICAL SITE	DIR (DEG)	220	190	220	270	230	290	30	250	210	210
WORCESTER	VEL (MPH)	12.6	5.6	11.7	6.9	10.4	7.1	4.0	1.9	15.5	8.0
	SPD (MPH)	13.4	6.8	11.8	8.1	10.5	7.8	4.6	4.0	15.5	8.2
	RATIO	0.944	0.833	0.992	0.857	0.989	0.921	0.864	0.463	0.996	0.973
STAMFORD-020 (8697)	CO	20.0	17.1	15.0	12.3	11.8	10.6	10.2	9.9	9.8	9.5
	DATE	1/14/85	1/28/85	2/11/85	12/23/85	11/18/85	11/19/85	12/24/85	1/24/85	10/18/85	11/ 1/85
METEOROLOGICAL SITE	DIR (DEG)	240	300	50	190	250	210	190	250	210	50
NEWARK	VEL (MPH)	8.0	6.8	4.3	6.4	5.3	4.0	2.5	12.0	6.8	10.7
	SPD (MPH)	8.8	9.3	6.9	7.0	8.2	6.6	3.2	12.7	8.5	11.8
	RATIO	0.911	0.723	0.627	0.909	0.643	0.605	0.789	0.947	0.808	0.909
METEOROLOGICAL SITE	DIR (DEG)	240	320	350	190	290	200	190	220	190	20
BRADLEY	VEL (MPH)	3.9	3.3	1.7	6.4	4.5	4.6	1.7	4.7	6.3	4.5
	SPD (MPH)	4.9	3.3	3.7	6.9	4.7	4.9	5.6	6.0	6.9	4.7
	RATIO	0.803	0.983	0.461	0.932	0.956	0.938	0.296	0.786	0.916	0.939
METEOROLOGICAL SITE	DIR (DEG)	250	300	60	250	250	230	140	250	220	40
BRIDGEPORT	VEL (MPH)	6.3	6.0	5.9	9.2	3.0	5.1	2.0	11.2	7.0	5.8
	SPD (MPH)	7.5	7.3	6.9	9.5	4.9	5.2	5.0	11.4	8.6	8.6
	RATIO	0.844	0.813	0.859	0.972	0.622	0.992	0.398	0.987	0.815	0.671
METEOROLOGICAL SITE	DIR (DEG)	270	300	50	230	260	220	190	290	210	30
WORCESTER	VEL (MPH)	6.9	9.5	0.9	10.4	4.6	11.7	5.6	11.9	10.1	4.0
	SPD (MPH)	8.1	10.1	5.0	10.5	4.7	11.8	6.8	12.1	10.6	4.6
	RATIO	0.857	0.945	0.181	0.989	0.964	0.992	0.833	0.982	0.950	0.864

TABLE 26a

EXCEEDANCES OF THE 8-HOUR CO STANDARD

SITE	1981	1982	1983	1984	1985
Bridgeport-004	0	0	1	0	~~1~~ 0
Hartford-017	-	-	-	~~12~~ 7	~~6~~ 5
New Britain-002	1	~~3~~ 2	2	0	0
New Haven-007	~~1~~ 0	0	1	0[a]	0
Stamford-020	~~113~~ 100[b]	2[c]	1[d]	~~3~~ 2	~~2~~ 1

[a] Data is missing from January through September.
[b] Data is missing from October through December.
[c] A local road was changed from 2-way traffic to 1-way traffic.
[d] 90% of the data is missing for November and December.

FIGURE 13

EXCEEDANCES OF THE 8-HOUR CO STANDARD

SITE: BRIDGEPORT-004

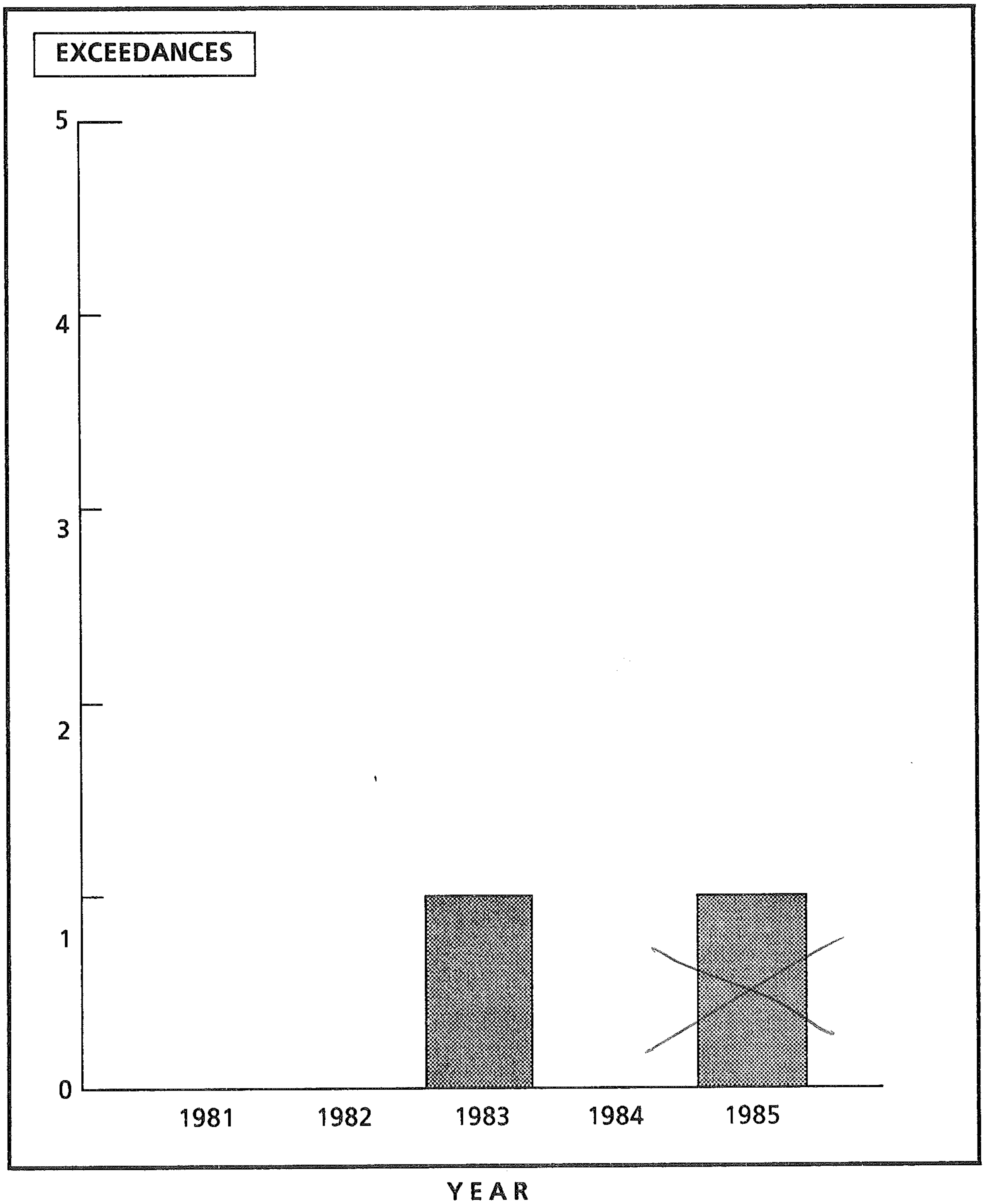
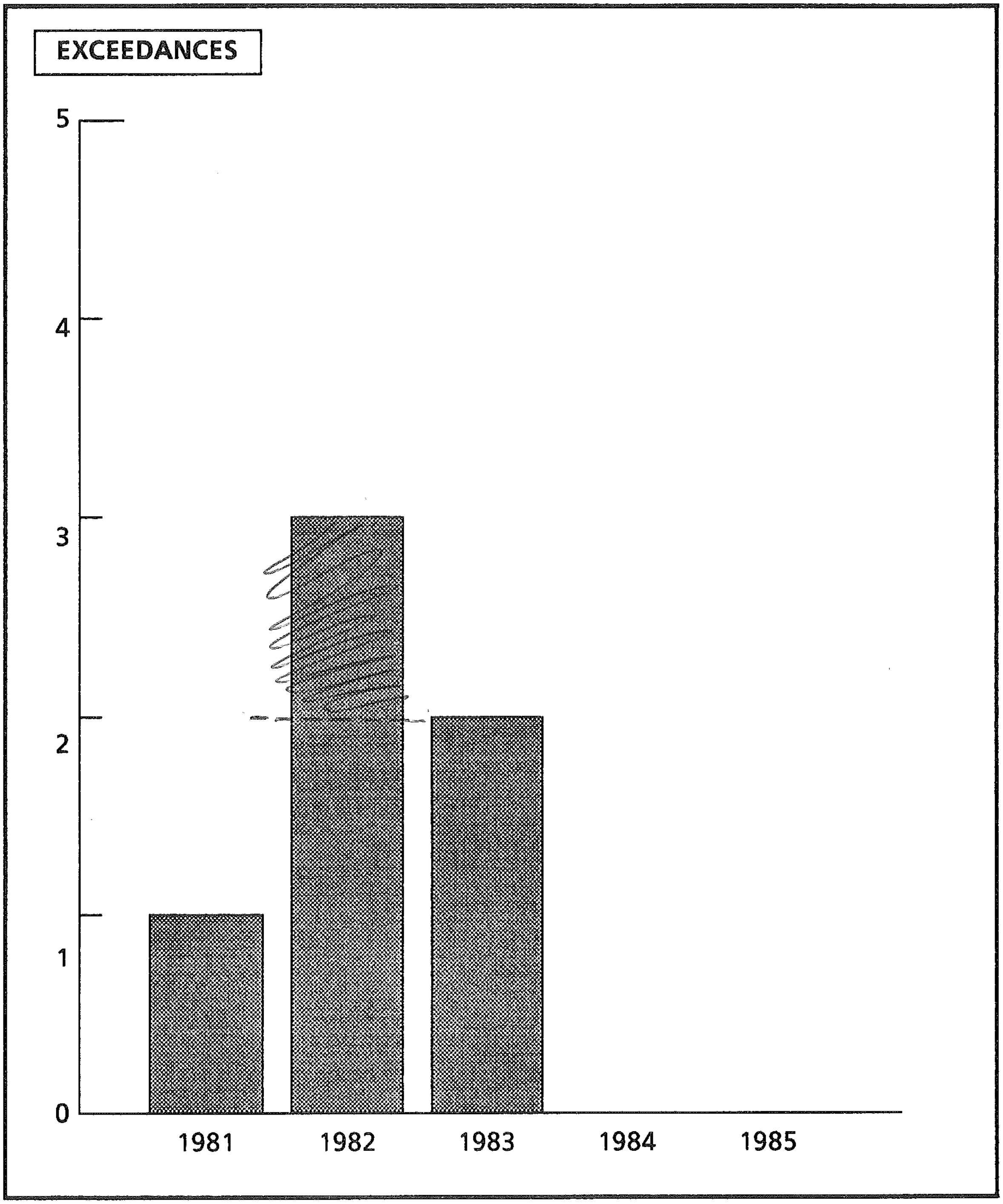


FIGURE 13, CONTINUED

EXCEEDANCES OF THE 8-HOUR CO STANDARD

SITE: NEW BRITAIN-002



YEAR

FIGURE 13, CONTINUED

EXCEEDANCES OF THE 8-HOUR CO STANDARD

SITE: NEW HAVEN-007

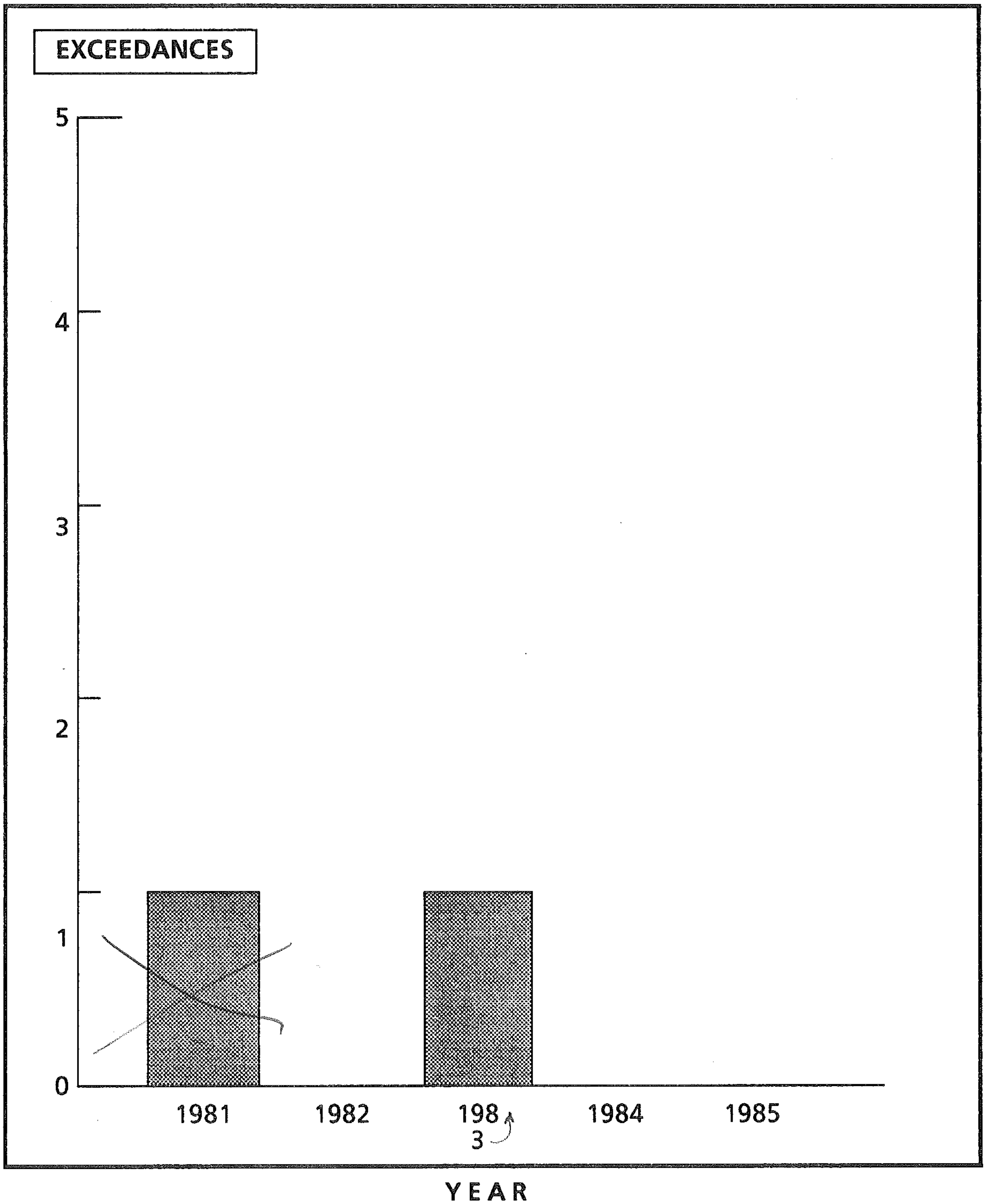


FIGURE 14

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: BRIDGEPORT-004

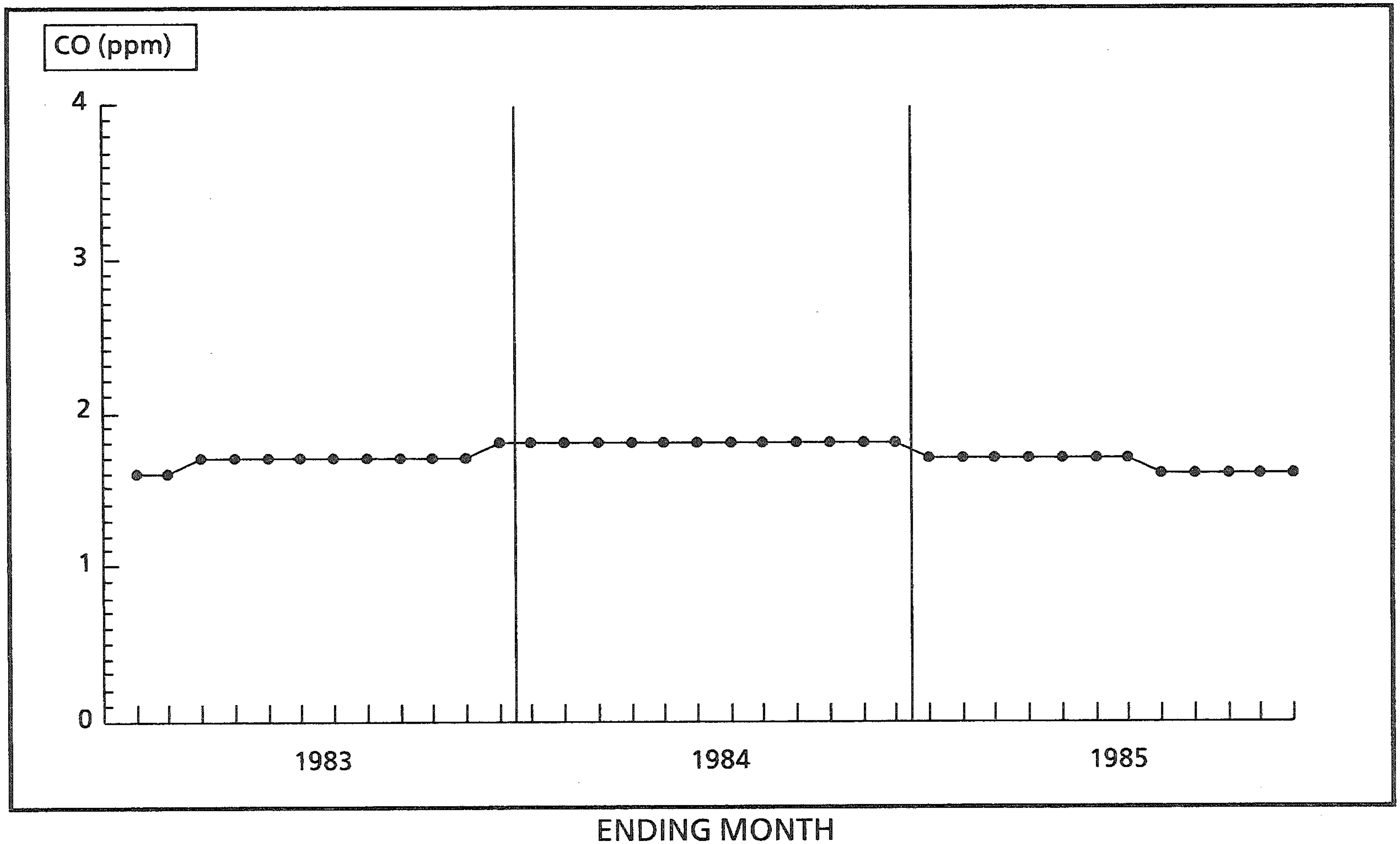


FIGURE 14, CONTINUED

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: NEW BRITAIN-002

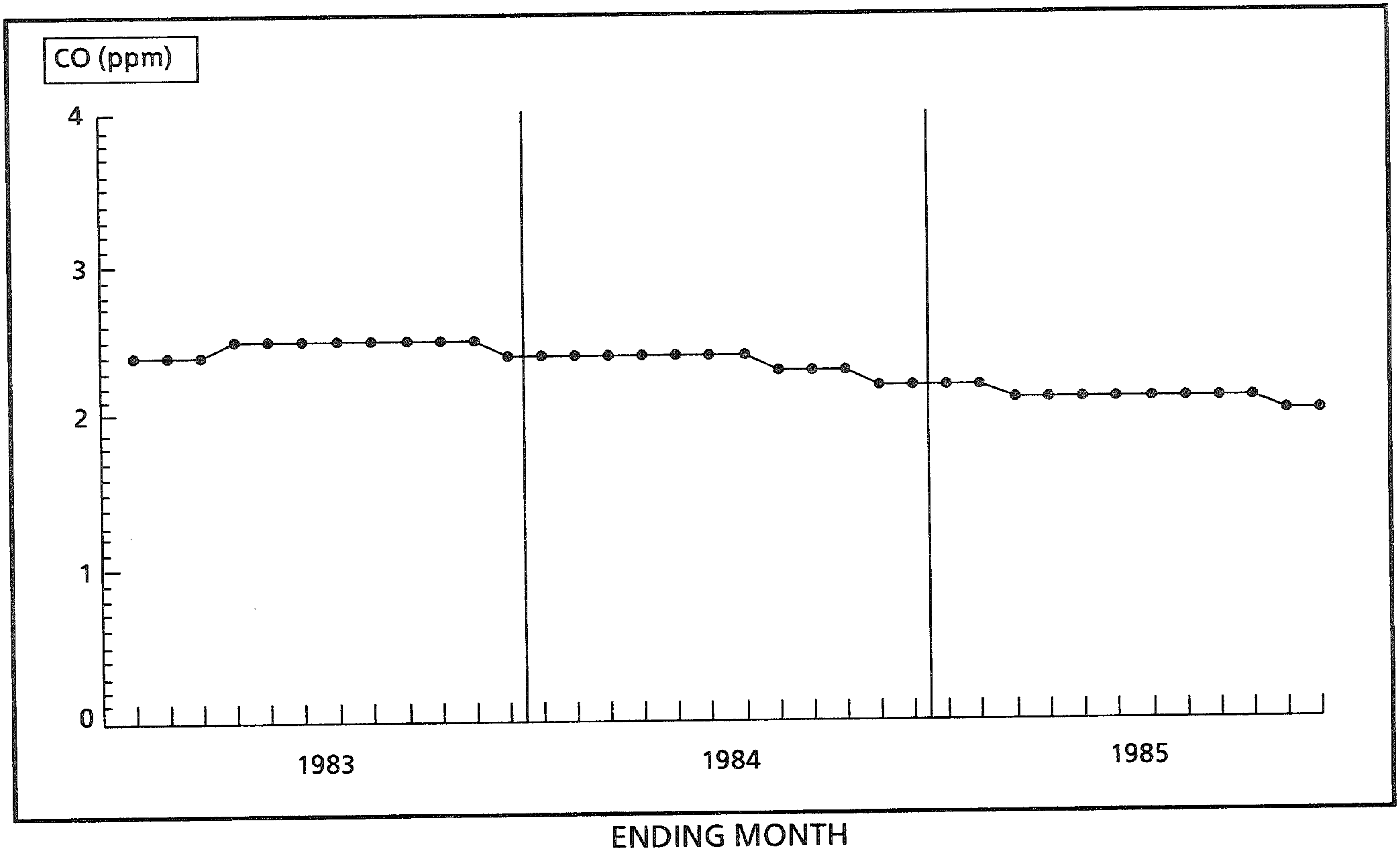


FIGURE 14, CONTINUED

36-MONTH RUNNING AVERAGES OF THE HOURLY CO CONCENTRATIONS

SITE: NEW HAVEN-007

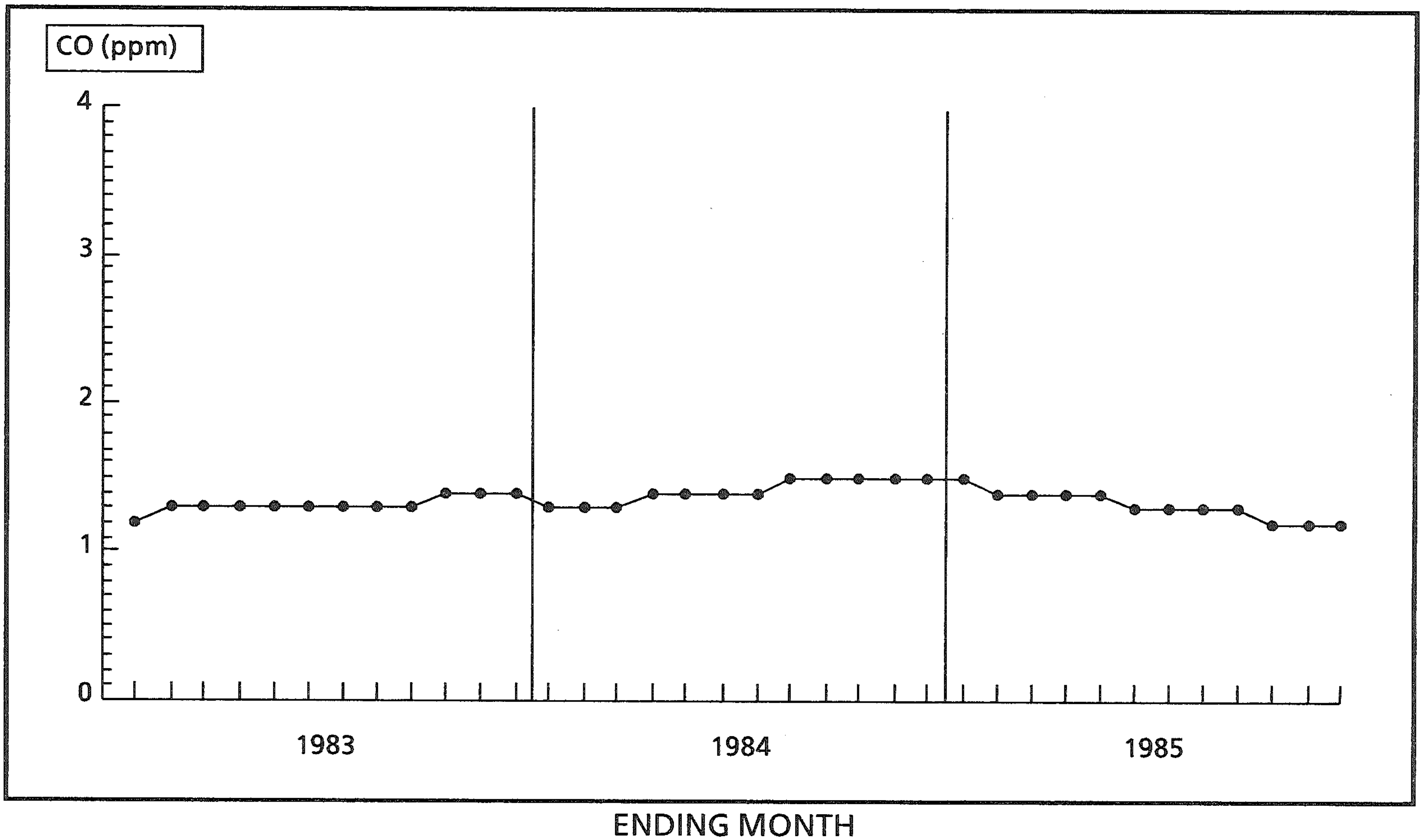
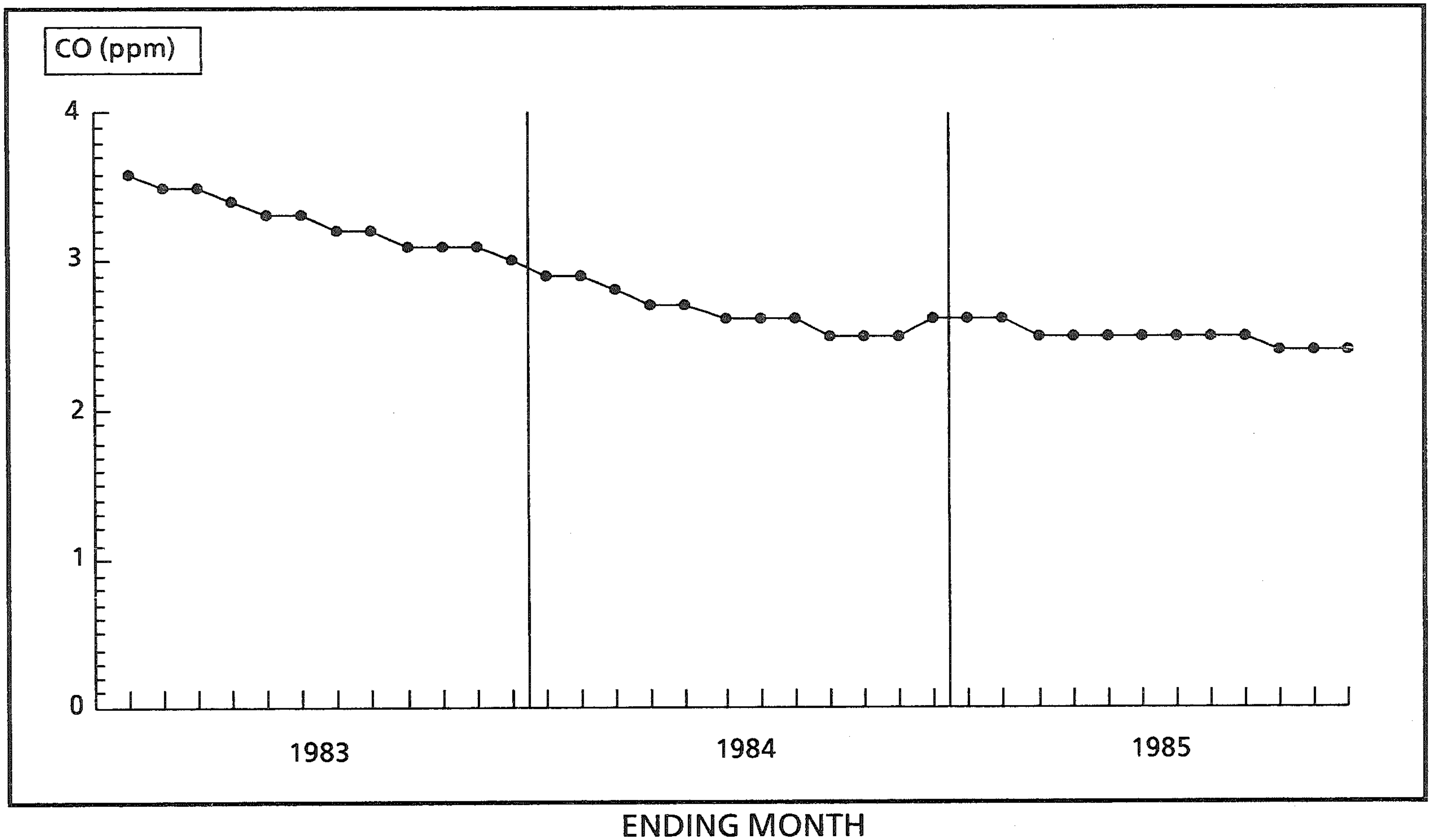


FIGURE 14, CONTINUED

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 73% of the national total 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. Except in special cases, the contribution to the total body burden of lead via inhalation of airborne lead in urban areas is usually less than 30%. In non-urban areas, it is usually less than 5%.

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 1985.

The monitoring sites where the lead levels were highest were generally in urban locations with moderate to heavy traffic. This is due to the fact that in Connecticut 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 1975 to 1985 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 0.977 (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 1985, both hi-vol and lo-vol samplers were operated in Connecticut to monitor lead levels (see Figure 15). There were 15 hi-vol sites and 7 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 seven lo-vol monitors in areas with populations of 200,000 or more. They are Hartford 015 and 016, Stamford 022, New Haven 016 and 018, West Haven 003, and Bridgeport 010. These "micro-scale" lead sites are situated near some of the busiest city streets 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 27 precision checks in 1985. The resulting 95% probability limits were -8% to +6%. Accuracy for lead is defined as the accuracy of the analysis method. It is determined by chemical analysis of known lead samples. There were 21 audits for accuracy conducted on the monitoring network in 1985. Two different concentration levels were tested: low and high. The 95% probability limits for the low level test ranged from -10% to +5%; those for the high level test ranged from -8% to +5%.

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: 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 1985. These values are also presented in graphical form in Figure 16 for the period 1983-85. The New Haven-018 site lacked sufficient data and is not included in Table 27 or Figure 16.

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 seven 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 seven 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

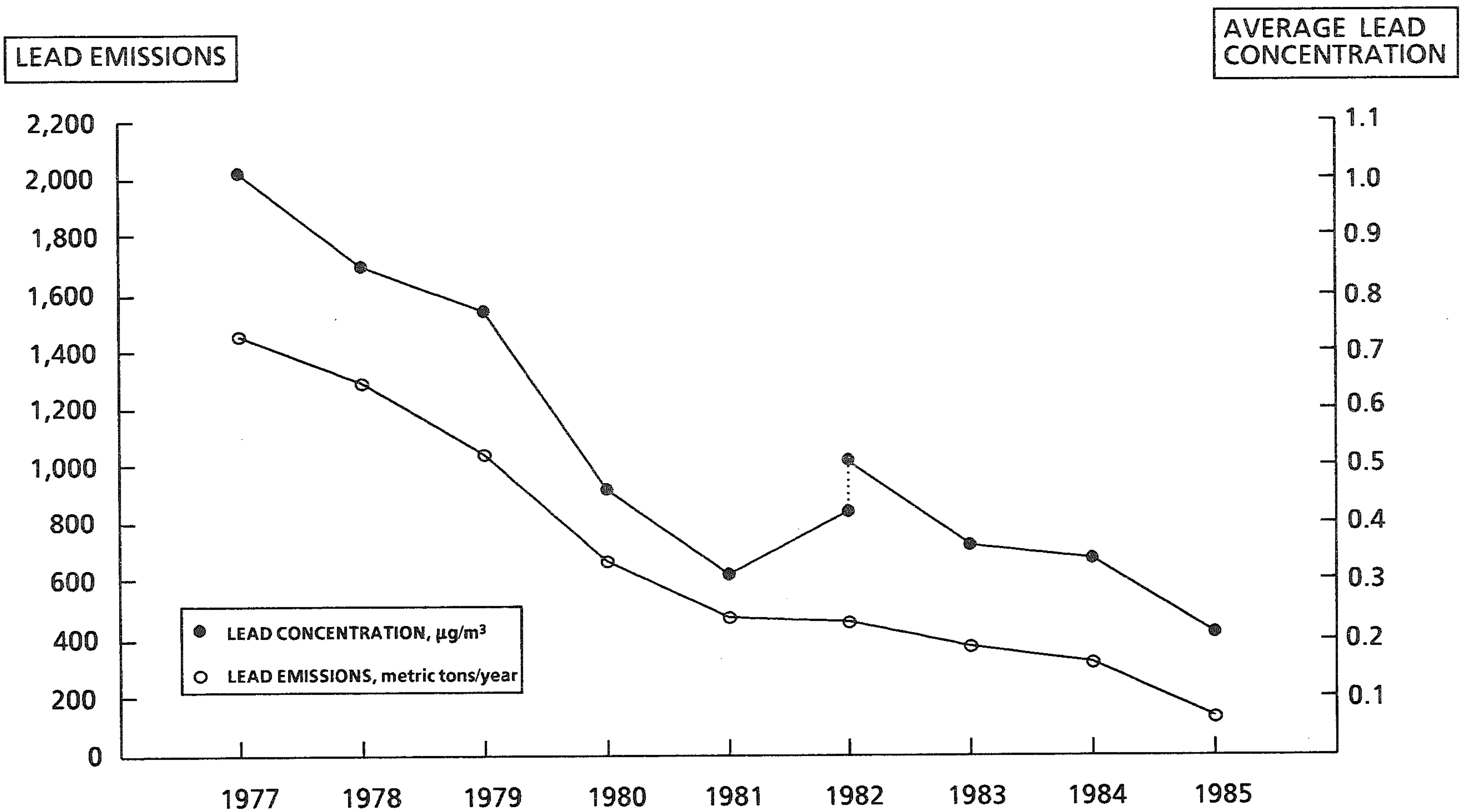
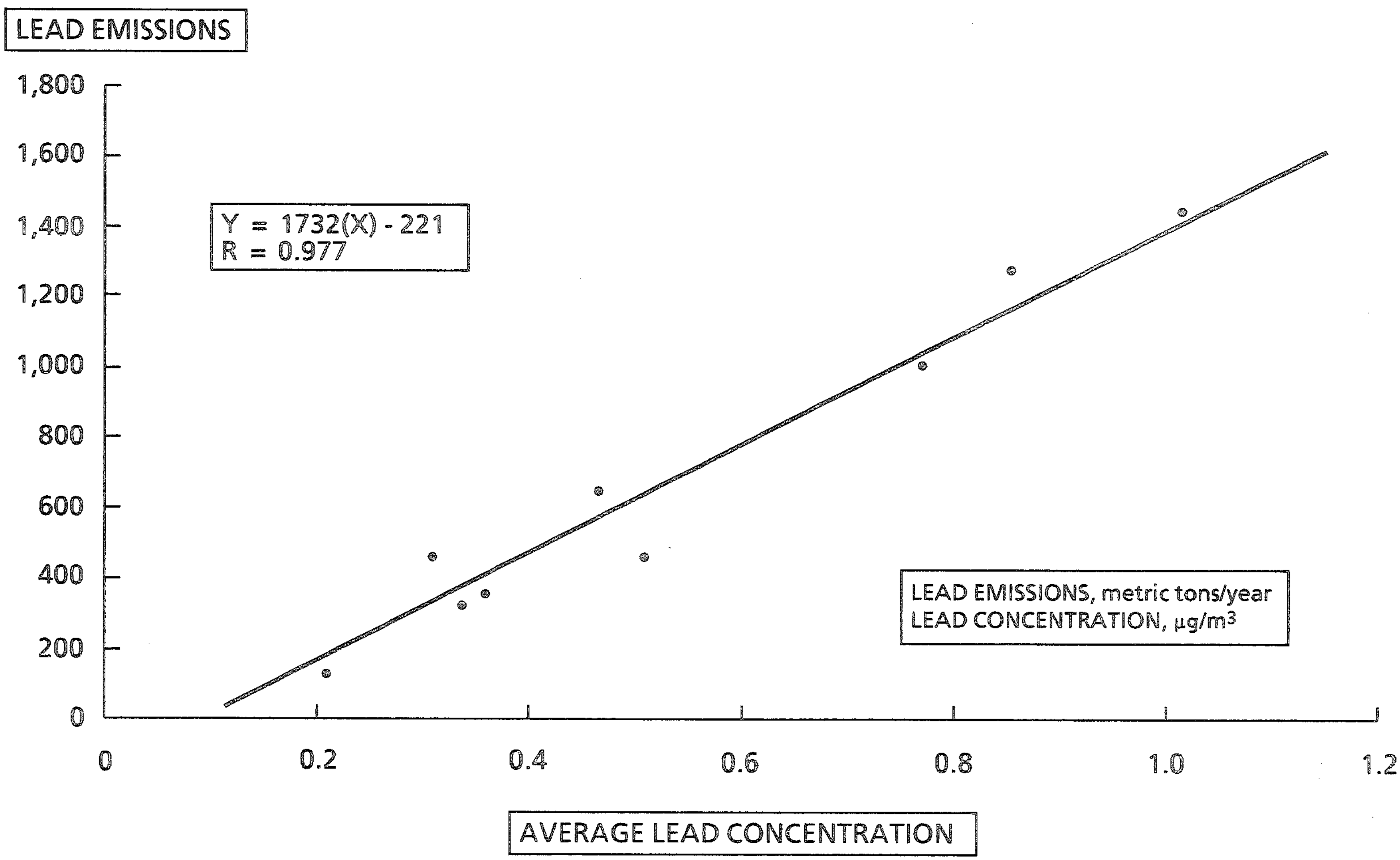


FIGURE B

STATEWIDE ANNUAL LEAD EMISSIONS FROM GASOLINE

VS.

STATEWIDE ANNUAL AVERAGE LEAD CONCENTRATIONS



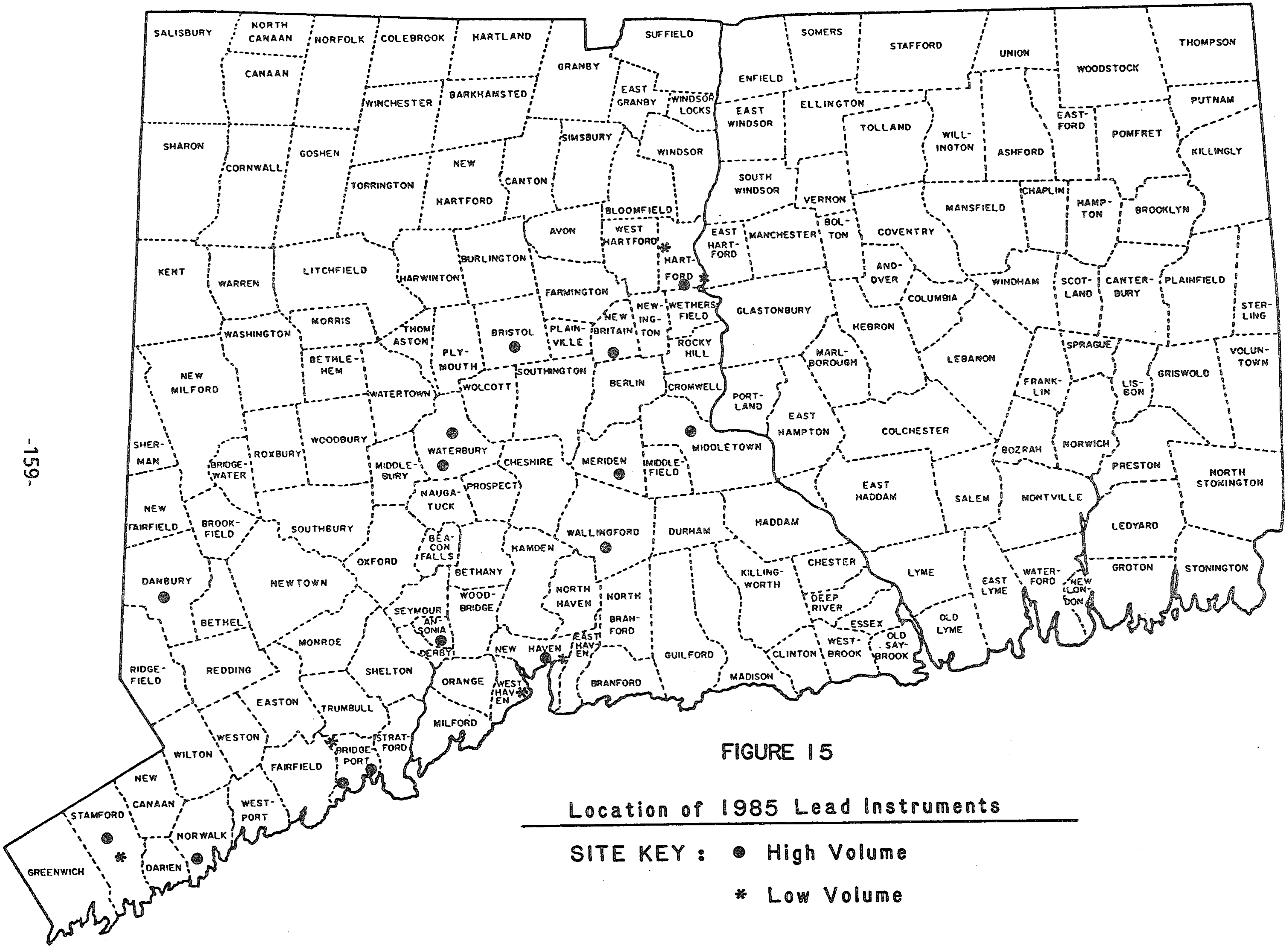


FIGURE 15

Location of 1985 Lead Instruments

TABLE 27

1985 3-MONTH RUNNING AVERAGE LEAD CONCENTRATIONS

TOWN-SITE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ansonia-004	-----	0.35	0.30	0.21	0.16	0.14	0.12	0.11	0.10	0.10	0.10	0.11
Bridgeport-009	0.31	0.32	0.29	0.25	0.20	0.19	0.15	0.13	0.13	0.13	0.11	0.09
Bridgeport-010	0.44	0.42	0.34	0.34	0.29	0.25	0.22	0.21	0.19	0.18	0.18	-----
Bridgeport-123	0.48	0.42	0.37	0.35	0.31	0.26	0.22	0.17	0.17	0.16	0.15	0.14
Bristol-001	0.24	0.23	0.20	0.17	0.14	0.11	0.10	0.09	0.09	0.09	0.09	0.09
Danbury-002	0.31	0.28	0.24	0.18	0.15	0.12	0.10	0.09	0.10	0.10	0.10	0.09
Hartford-014	0.49	0.42	0.32	0.24	0.21	0.18	0.15	0.13	0.13	0.15	0.14	0.14
Hartford-015	0.61	0.57	0.42	0.32	0.29	0.25	0.22	0.21	0.22	0.24	0.24	0.21
Hartford-016	0.65	0.61	0.42	0.39	0.30	0.31	0.29	0.28	0.27	0.27	0.26	0.25
Meriden-002	0.46	0.35	0.30	0.22	0.21	0.17	0.14	0.11	0.12	0.14	0.12	0.11
Middletown-003	0.34	0.32	0.26	0.21	0.19	0.20	0.15	-----	0.13	0.13	0.13	0.12
New Britain-007	0.31	0.25	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.10	0.09	0.08
New Haven-016	0.44	0.46	0.39	0.37	0.30	-----	-----	-----	0.21	-----	-----	-----
New Haven-123	0.48	0.43	0.45	0.43	0.41	0.27	0.22	0.17	0.16	-----	-----	-----
Norwalk-012	0.34	0.28	0.25	0.19	0.18	0.15	0.14	0.13	0.14	0.14	0.12	0.10
Stamford-001	0.25	0.22	0.21	-----	0.18	0.19	0.17	0.16	0.14	0.13	0.10	0.09
Stamford-022	0.35	0.31	0.29	0.30	0.25	0.24	0.21	0.25	-----	-----	-----	0.15
Wallingford-001	0.43	0.33	0.27	0.20	0.19	0.16	0.13	0.12	0.11	0.12	0.10	0.10
Waterbury-007	0.56	0.44	0.40	0.31	0.26	0.21	0.19	0.17	0.17	0.16	0.17	0.17
Waterbury-123	0.72	0.59	0.50	0.39	0.36	0.30	0.26	0.22	0.24	0.24	0.23	0.20
West Haven-003	-----	-----	-----	-----	-----	-----	-----	-----	0.25	0.24	0.23	0.21

N.B. The lead concentrations are in terms of micrograms per cubic meter ($\mu g/m^3$).

FIGURE 16

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=ANSONIA 004

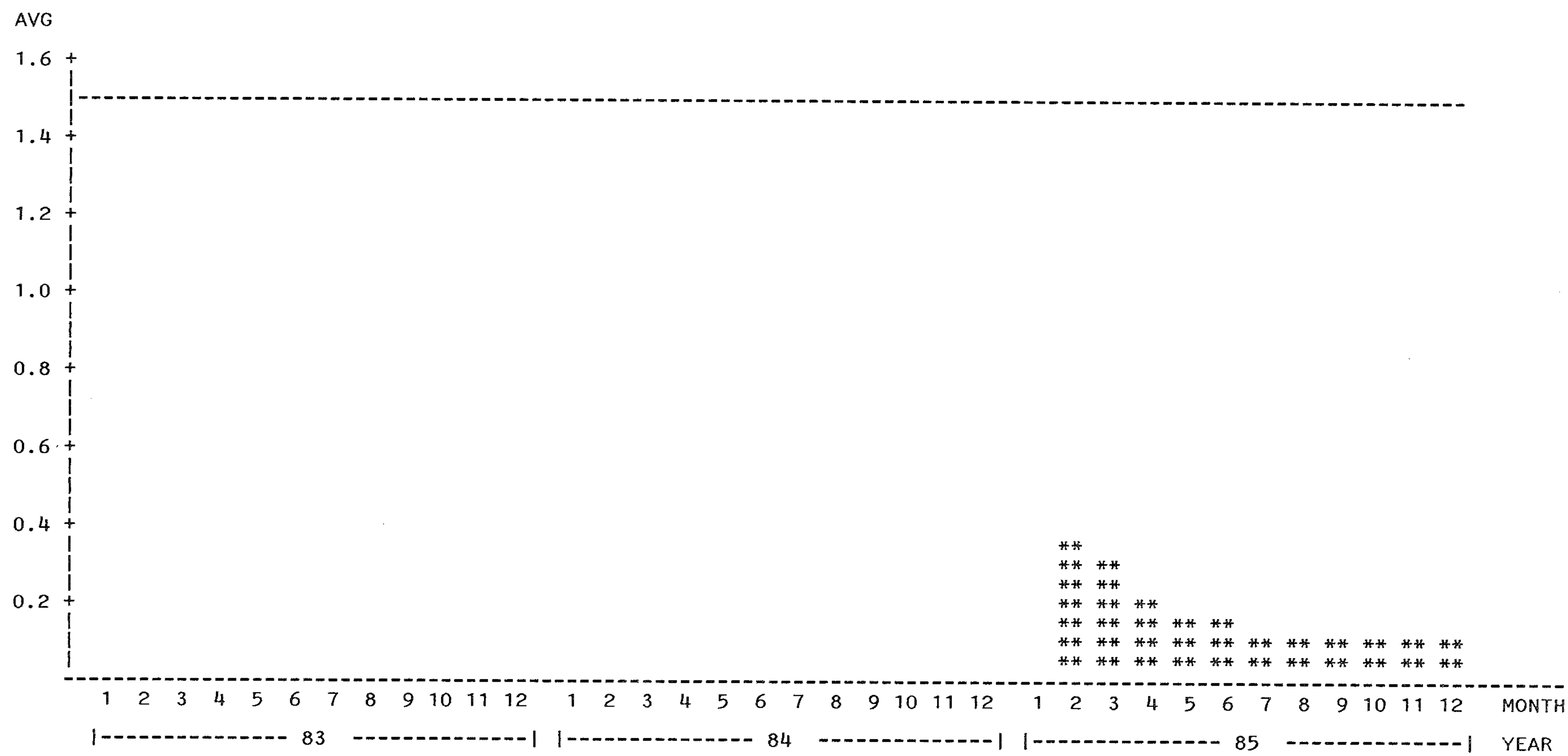


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 009

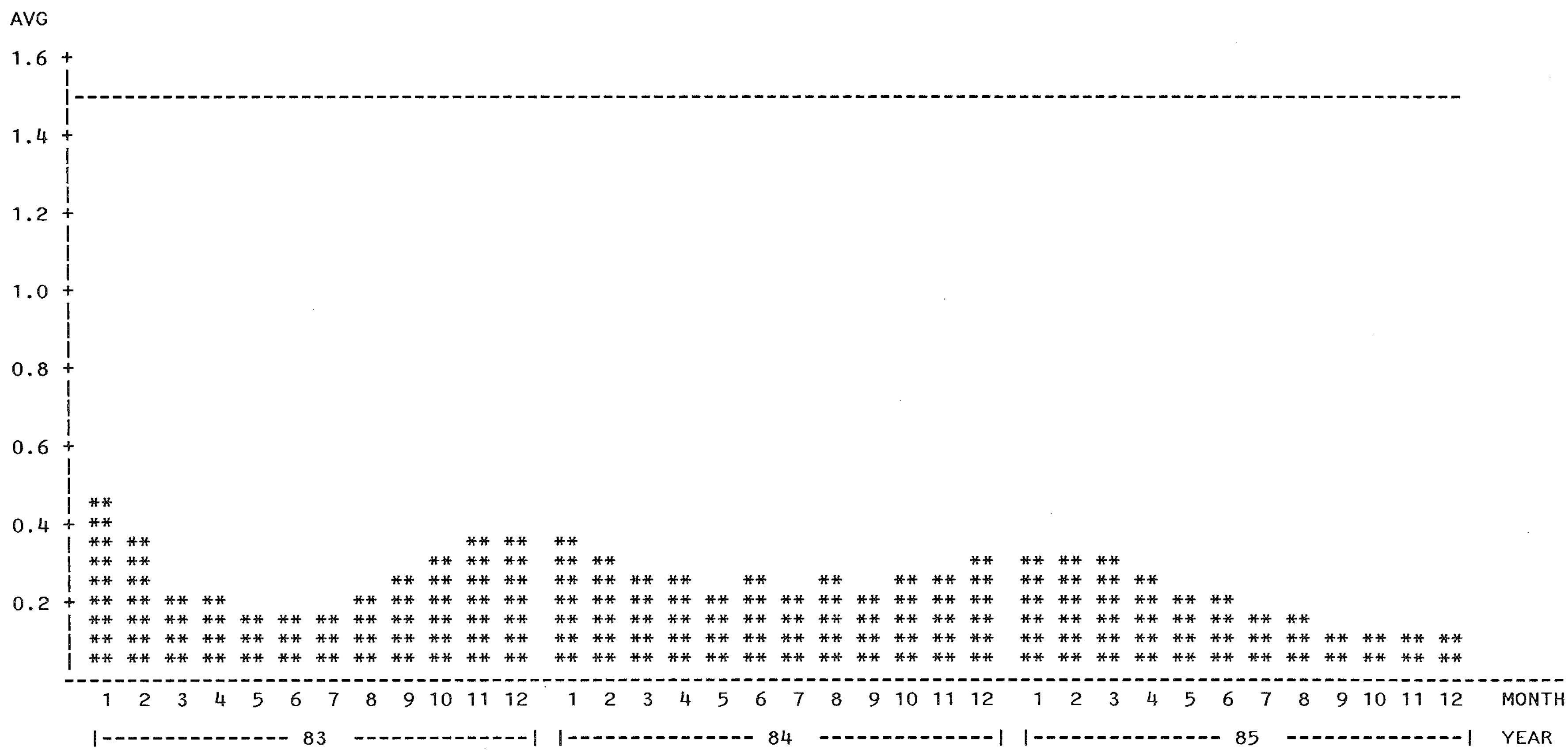


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 010

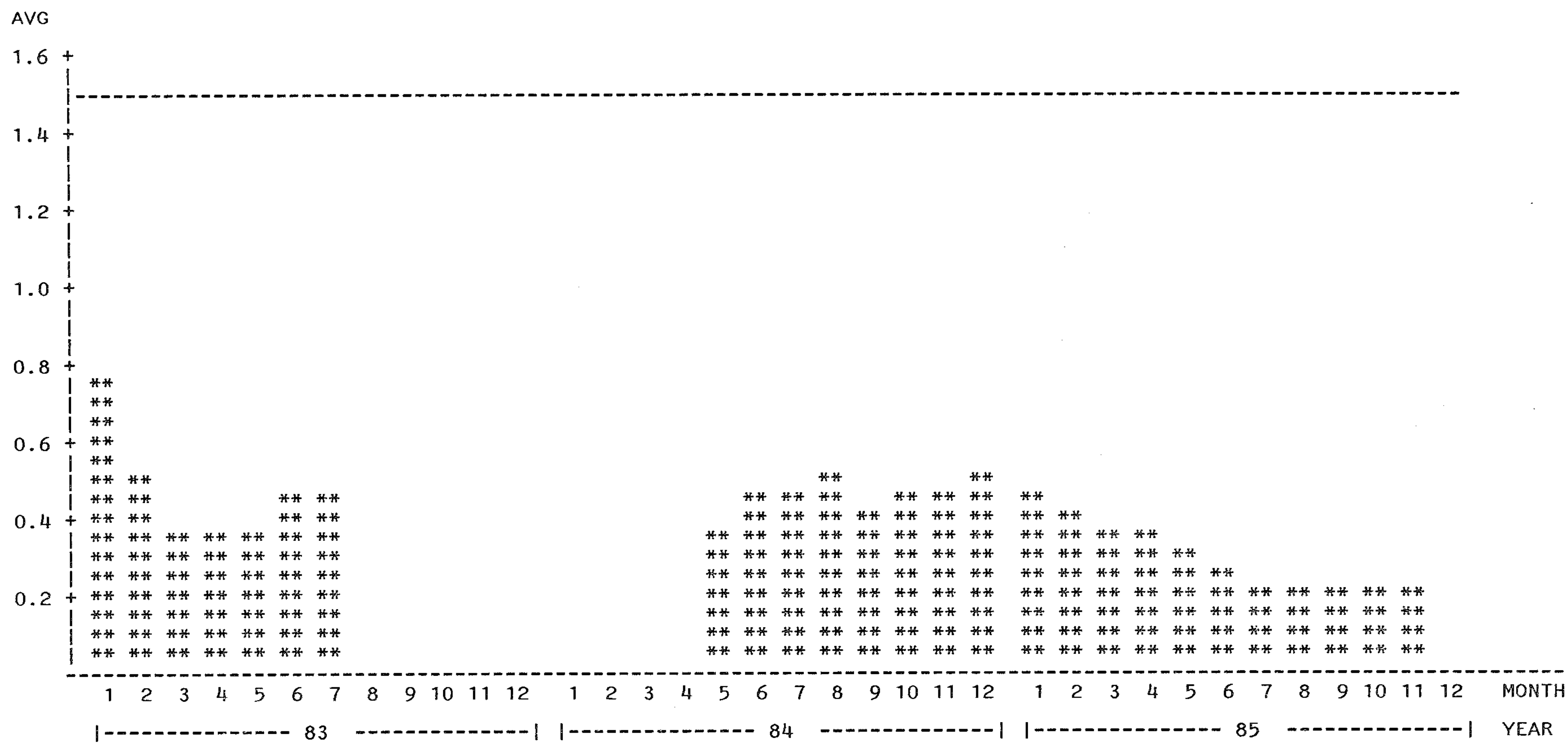


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRIDGEPORT 123

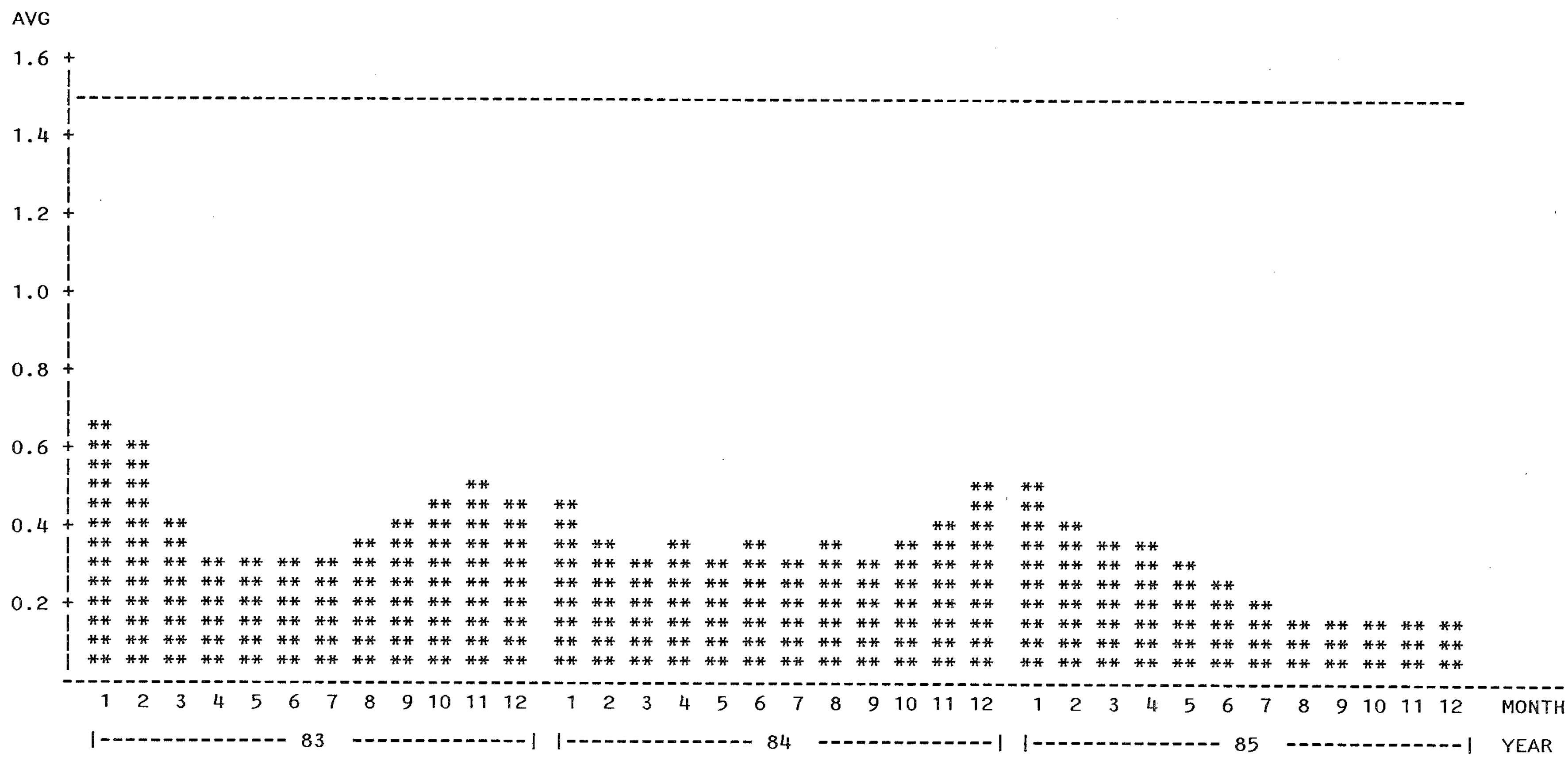


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=BRISTOL 001

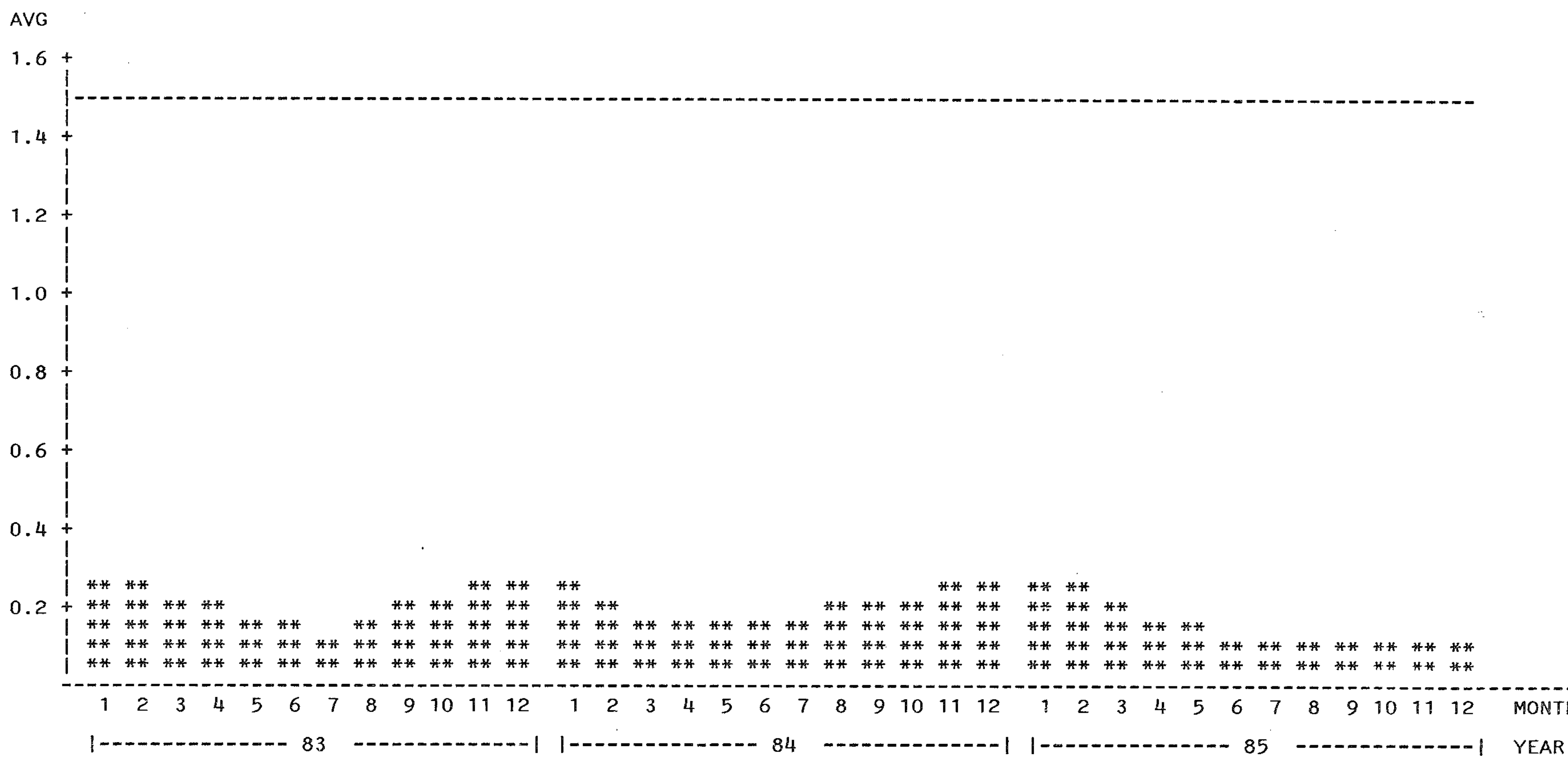


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=DANBURY 002

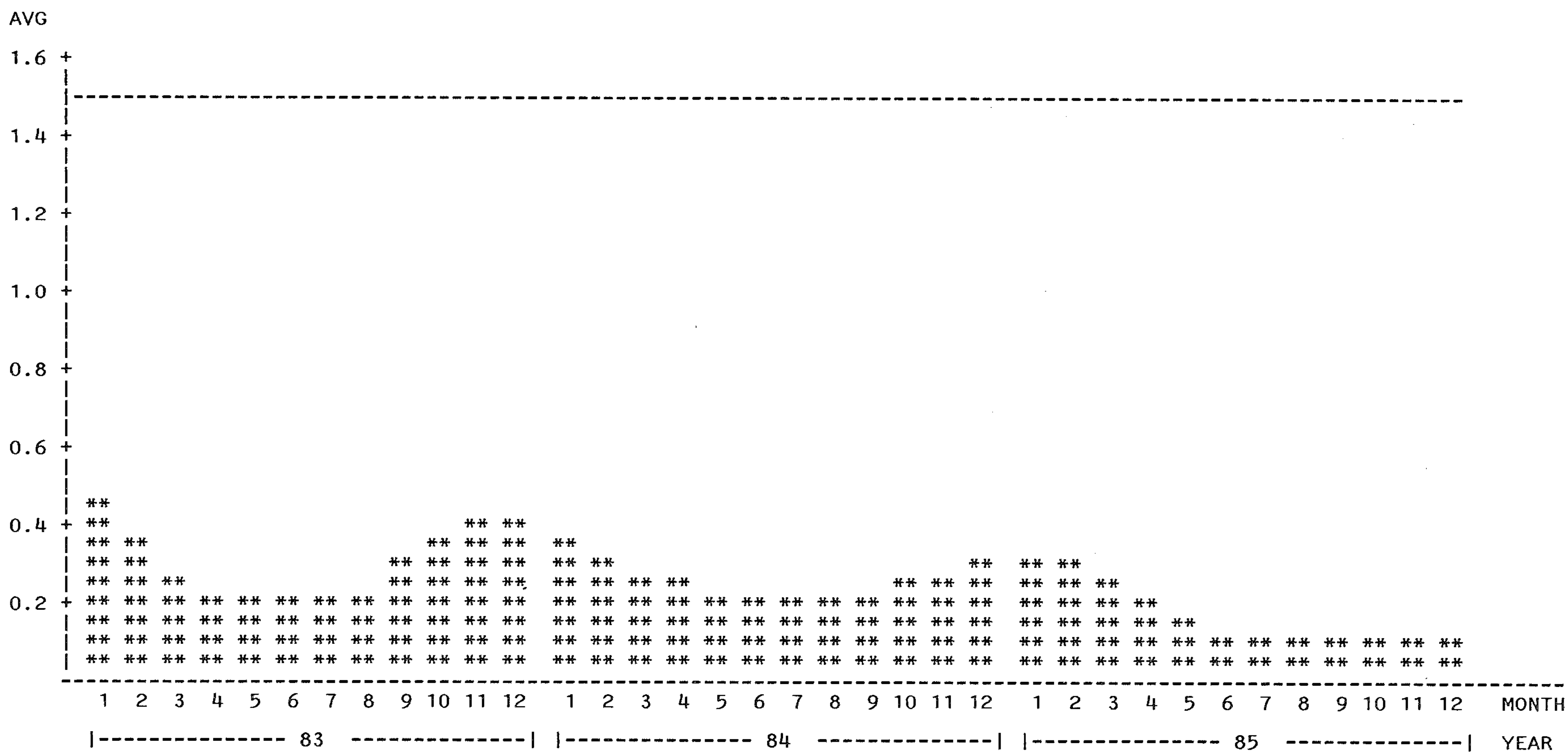


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 014

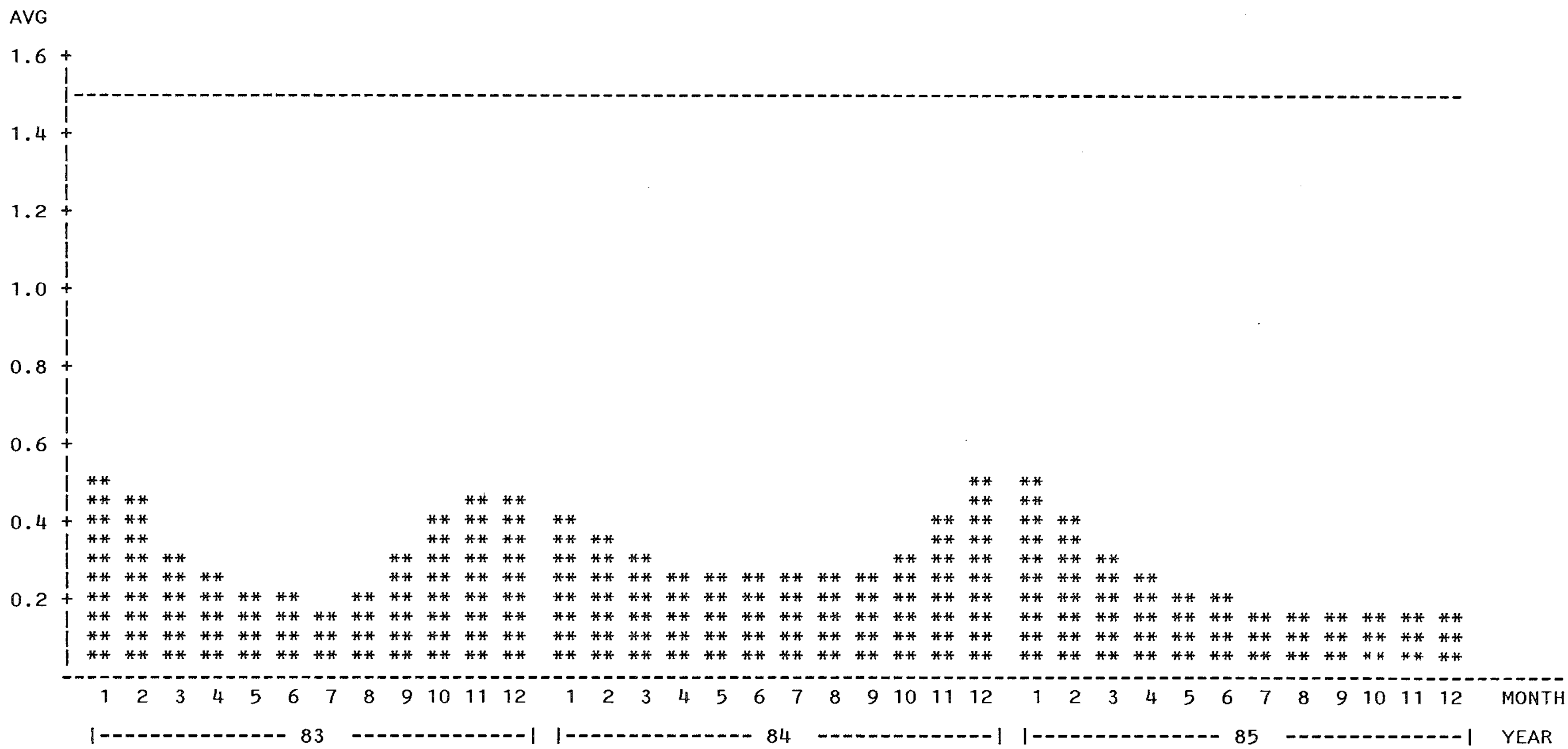


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 015

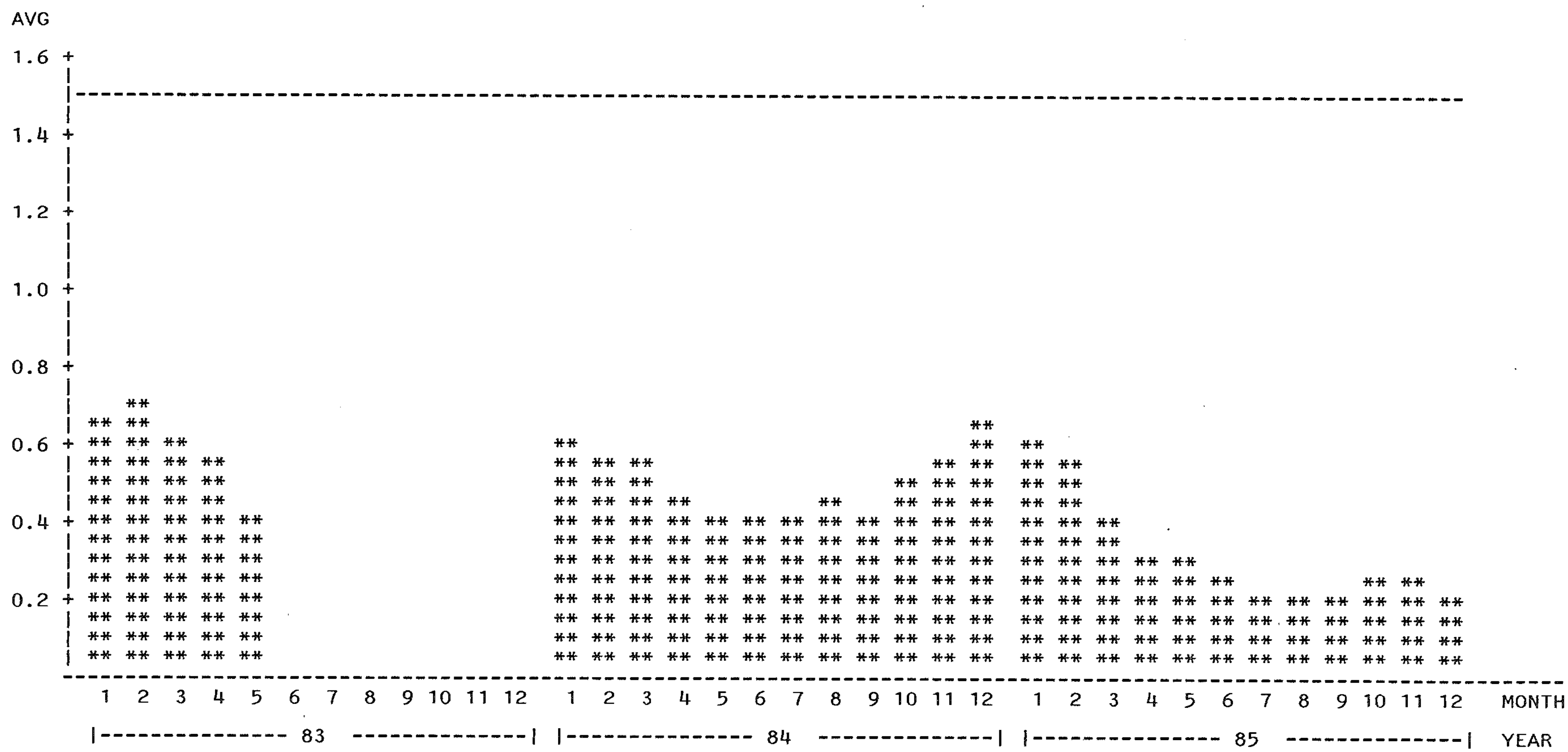


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=HARTFORD 016

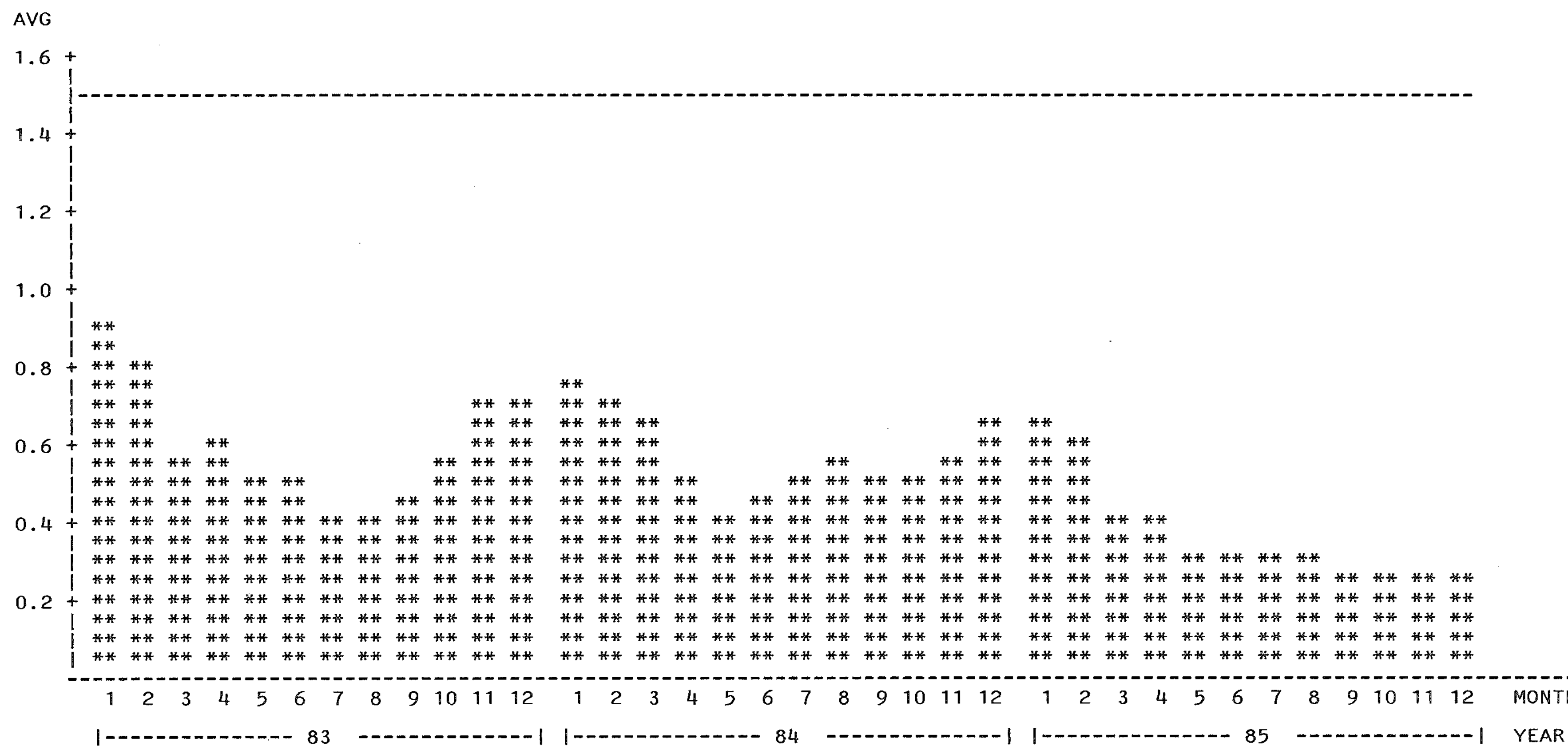


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=MERIDEN 002

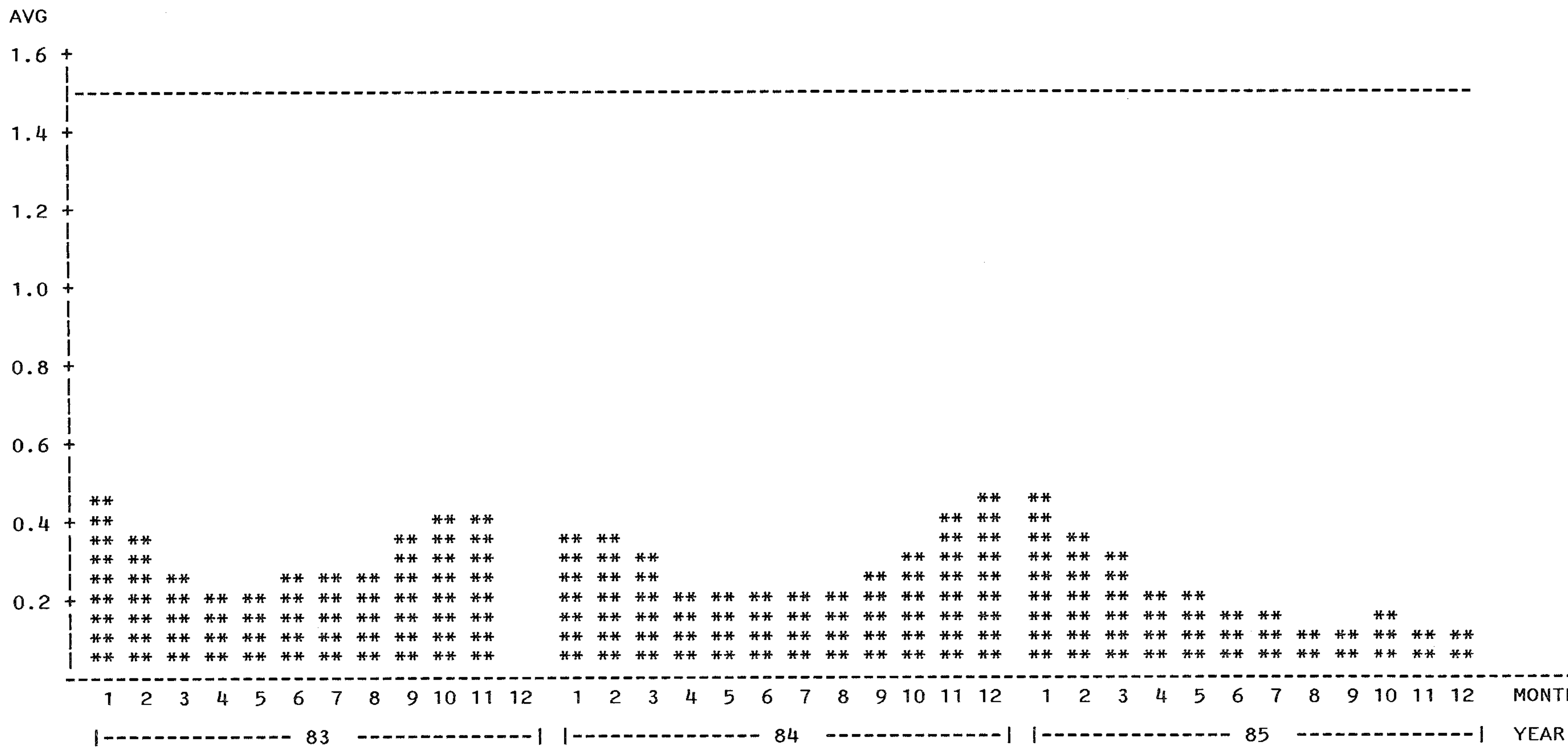


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=MIDDLETOWN 003

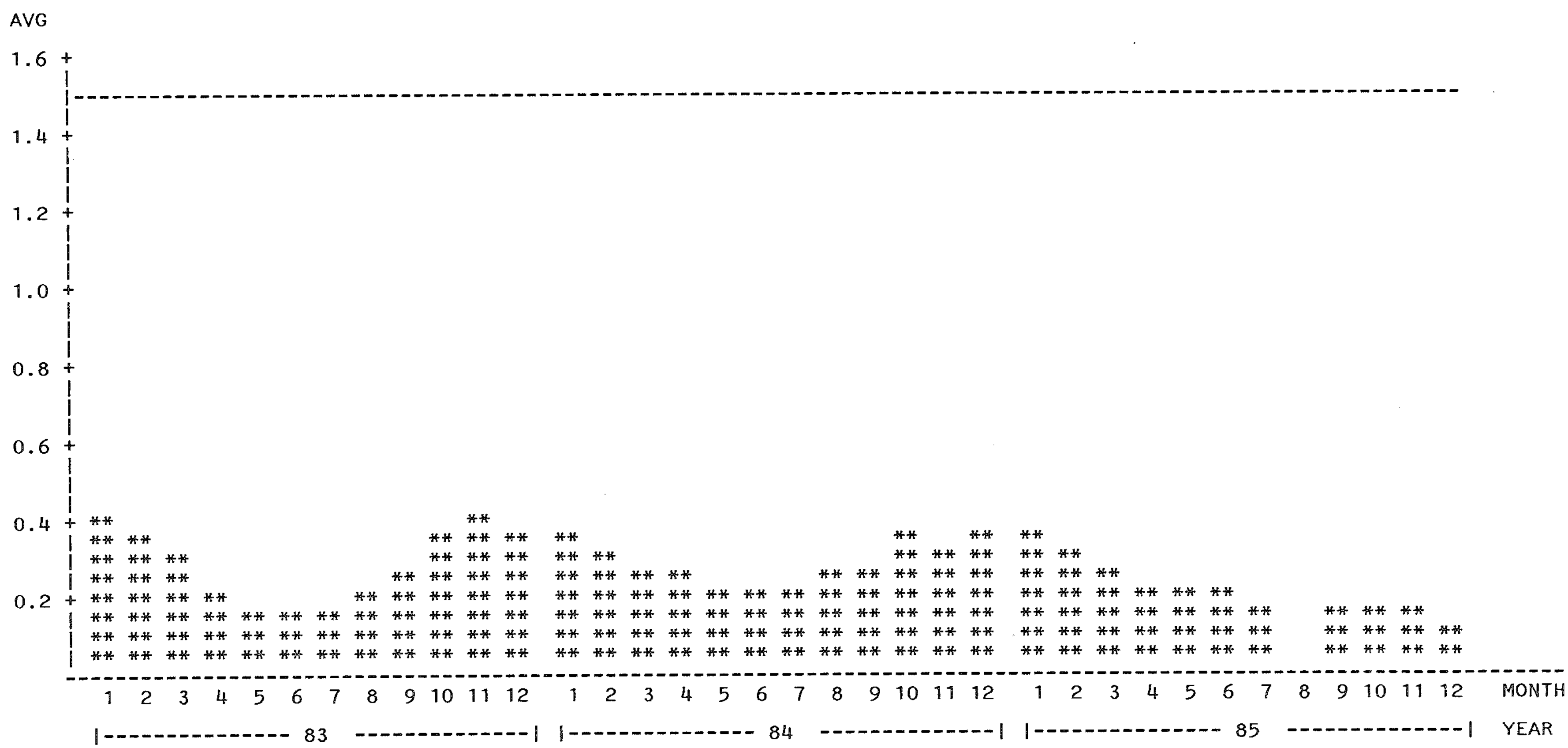


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NEW BRITAIN 007

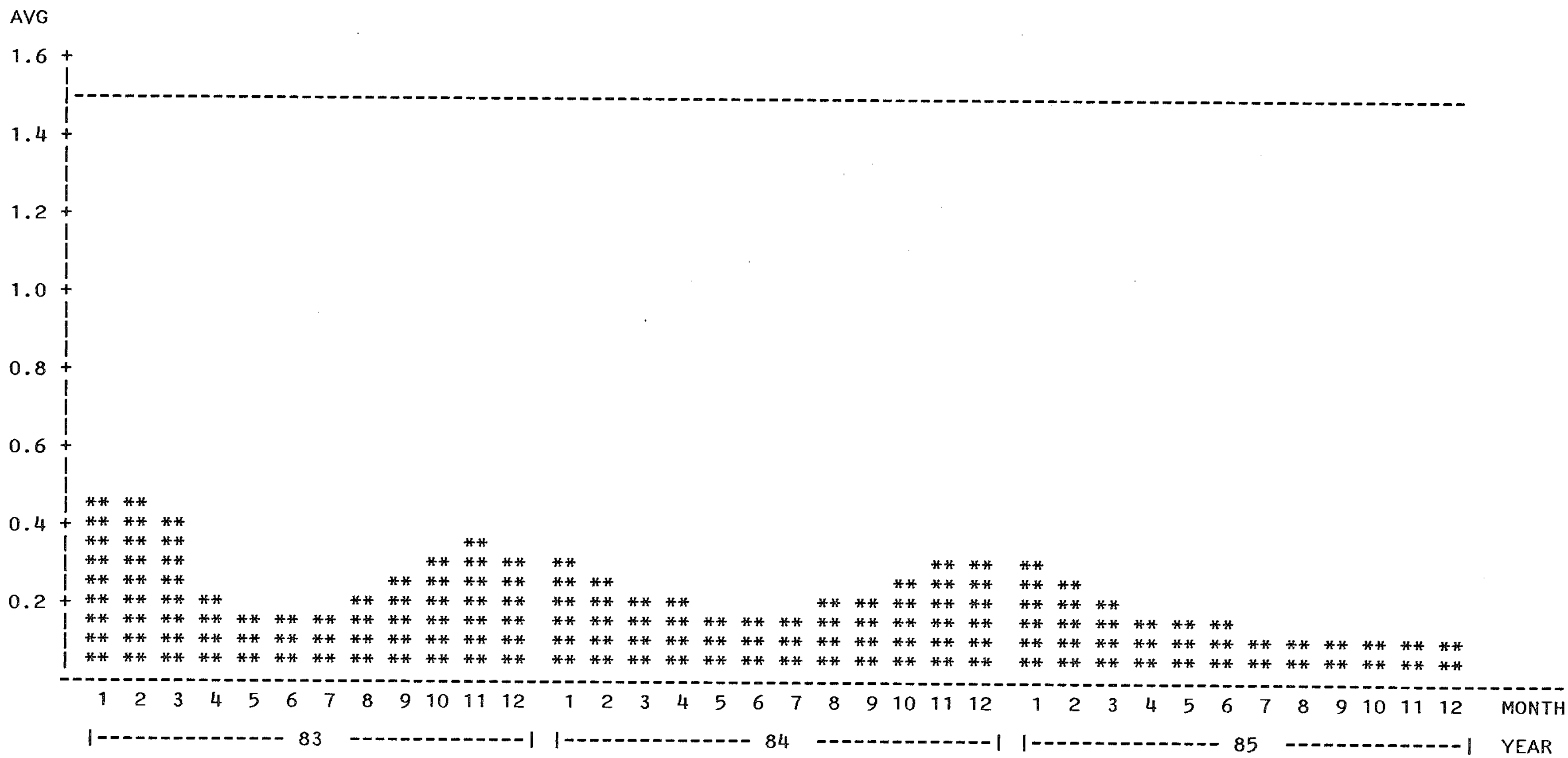


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NEW HAVEN 016

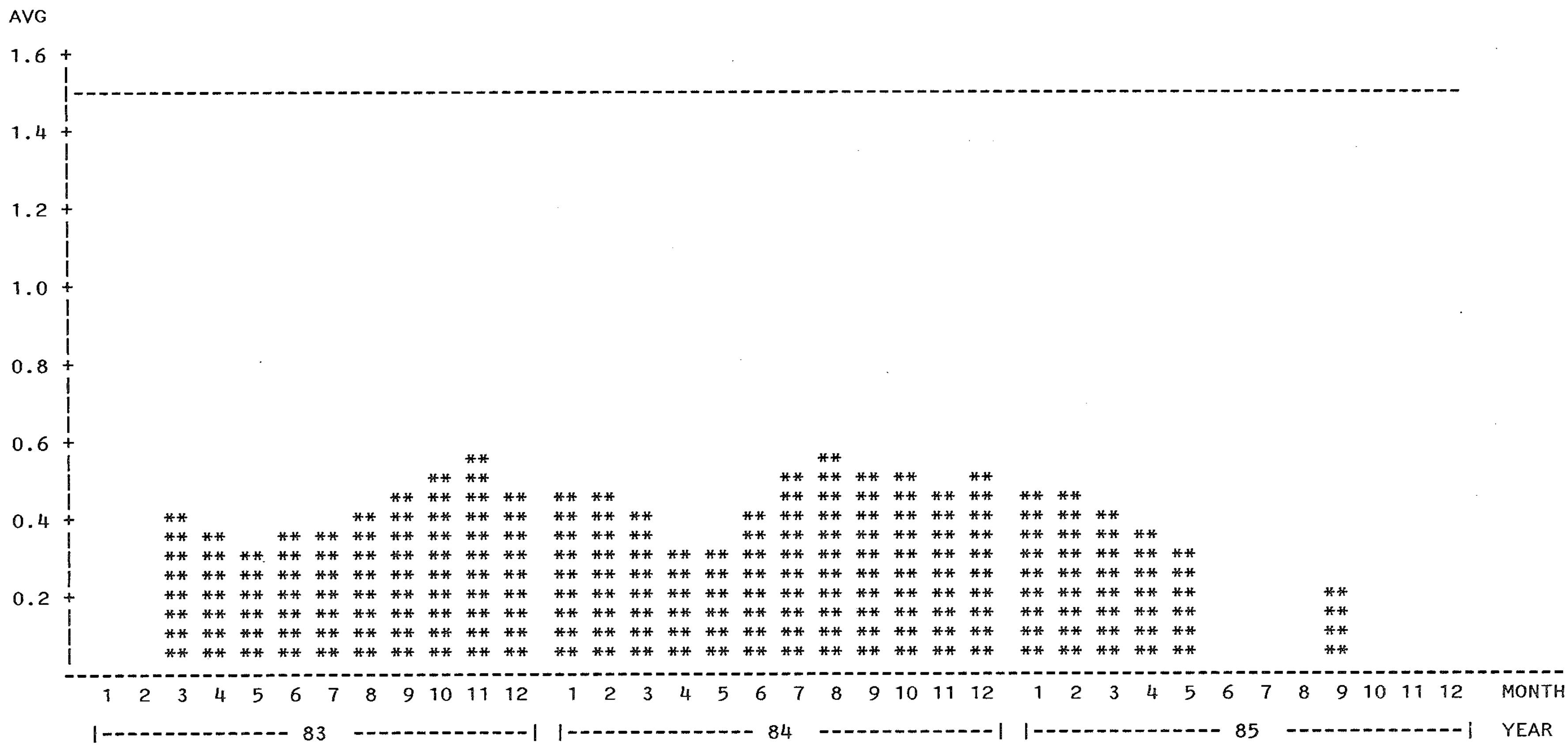


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NEW HAVEN 123

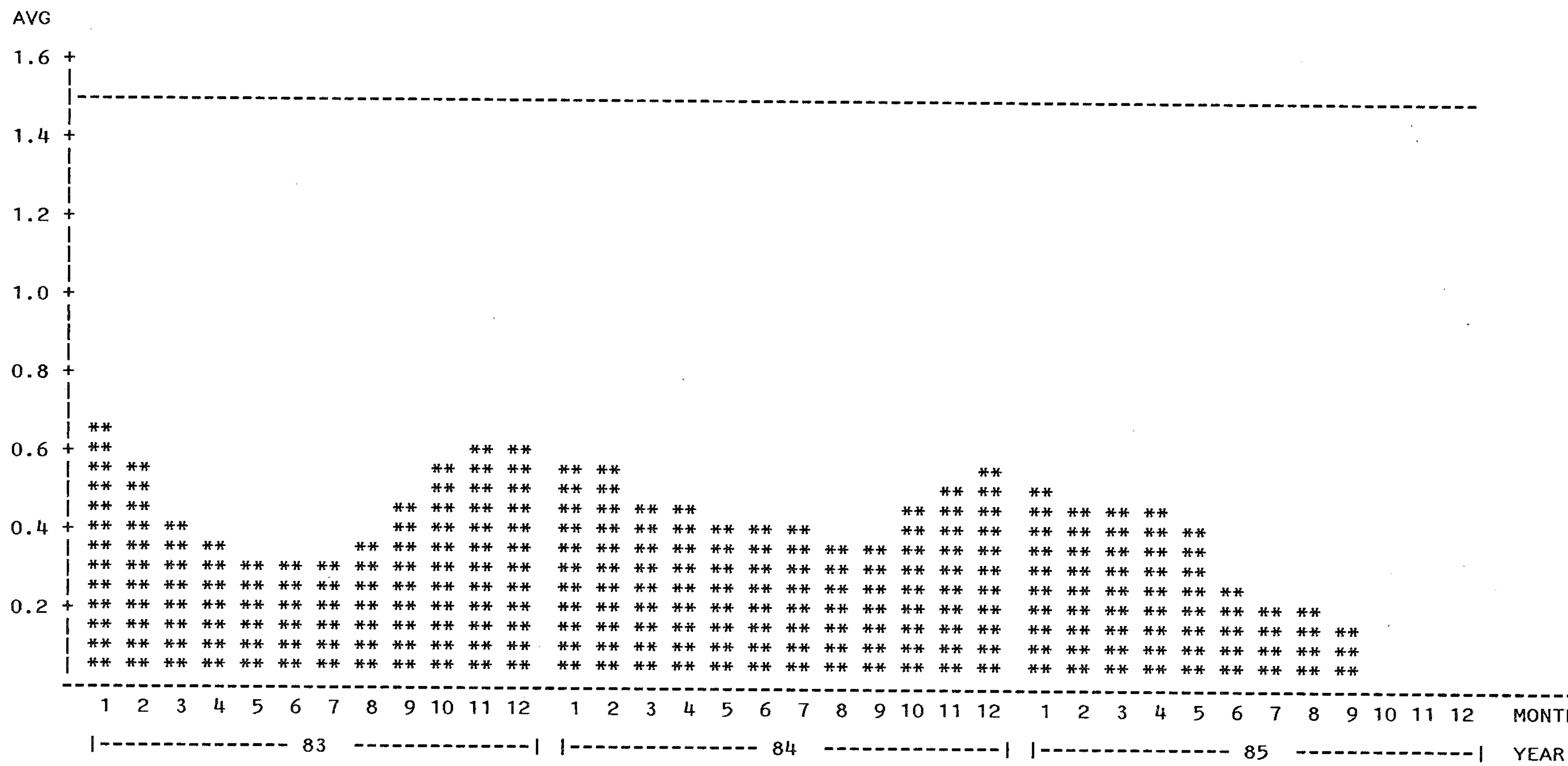


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=NORWALK 012

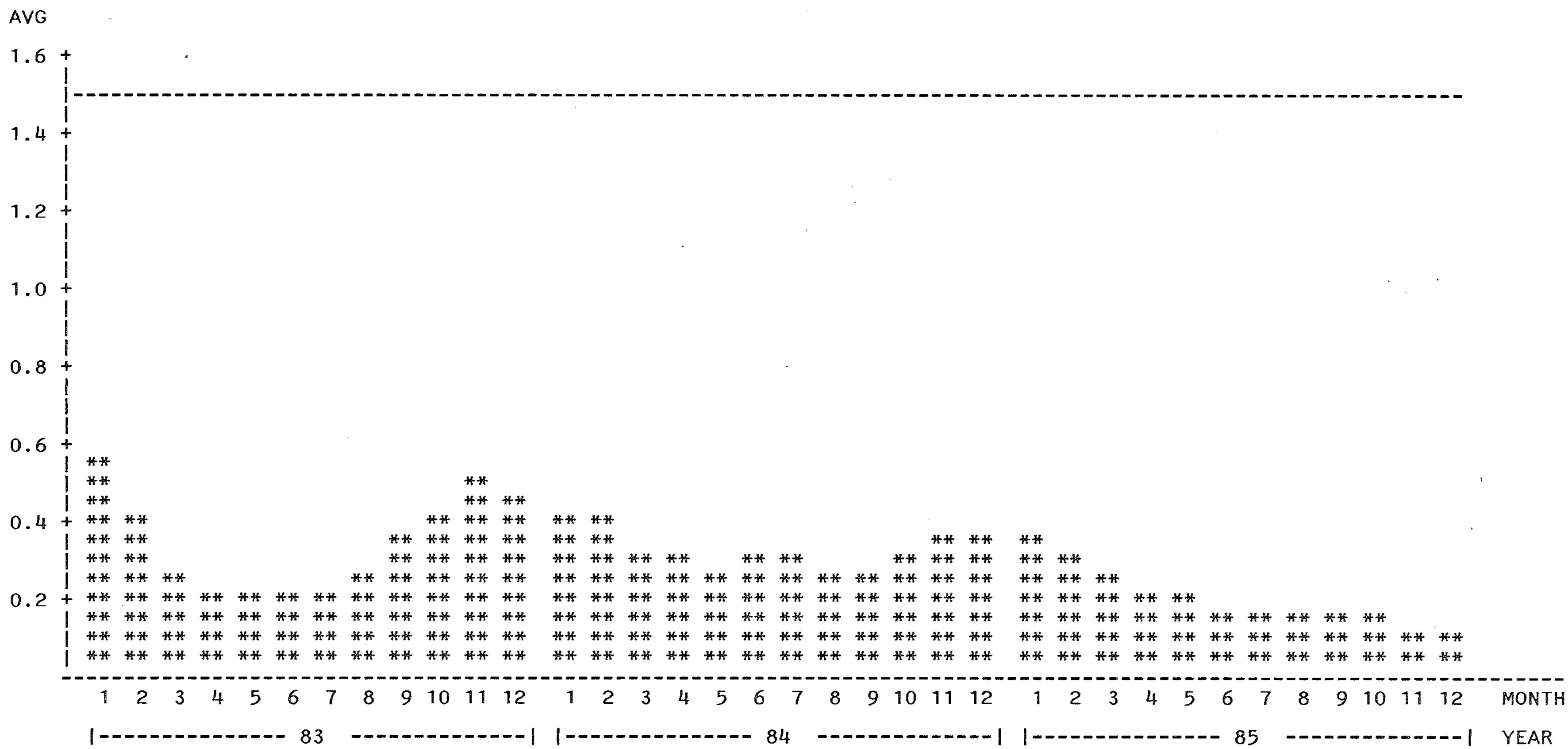


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=STAMFORD 001

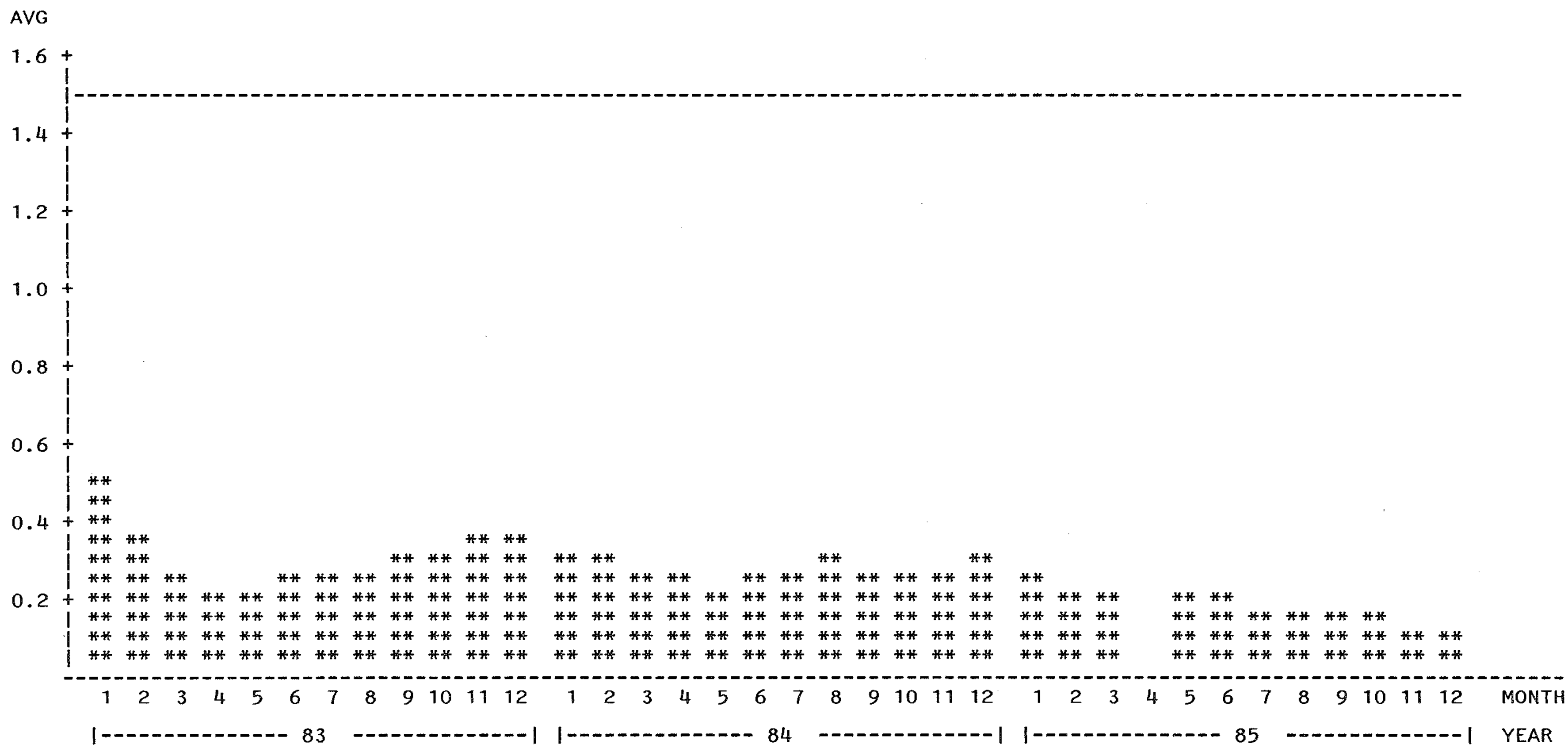


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=STAMFORD 022

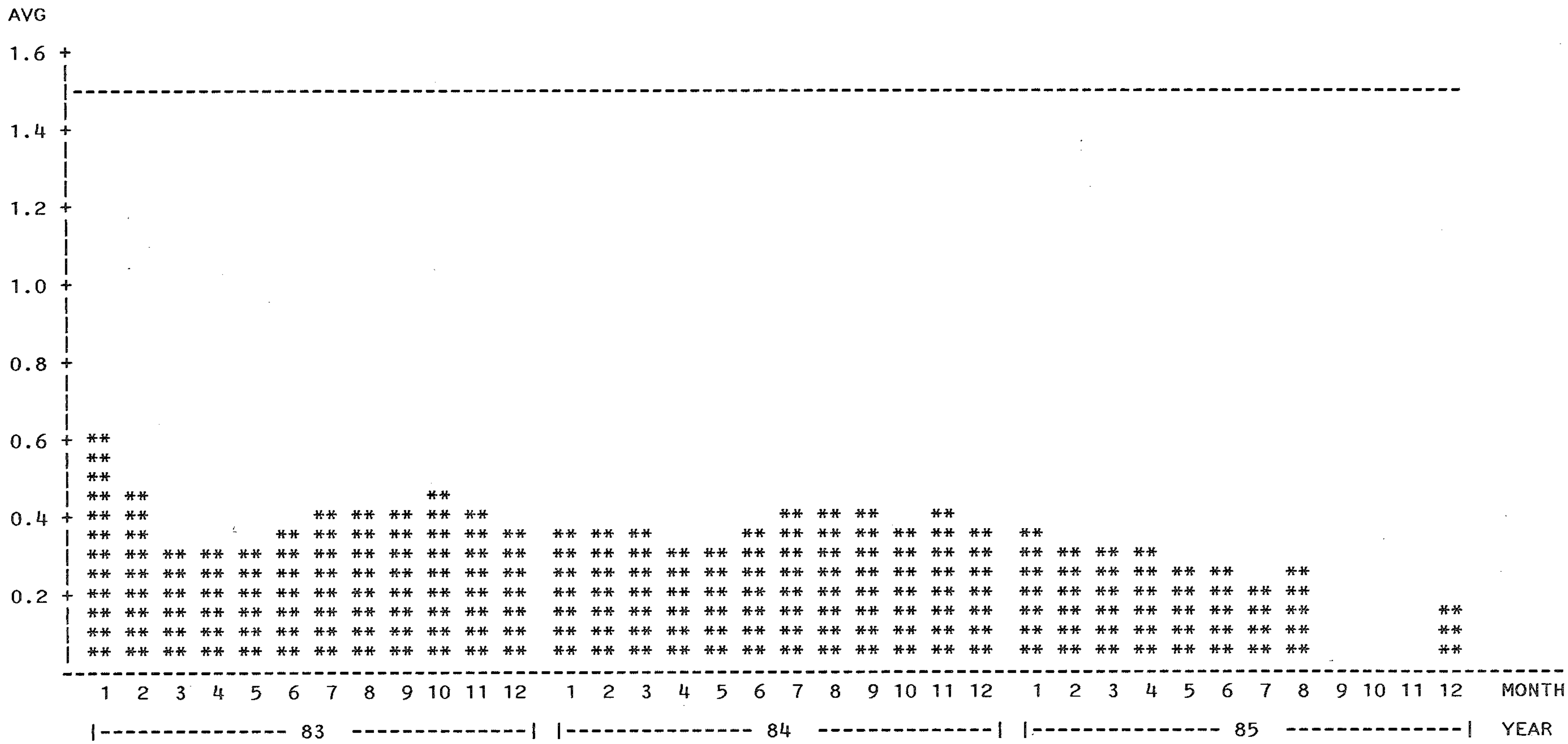


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WALLINGFORD 001

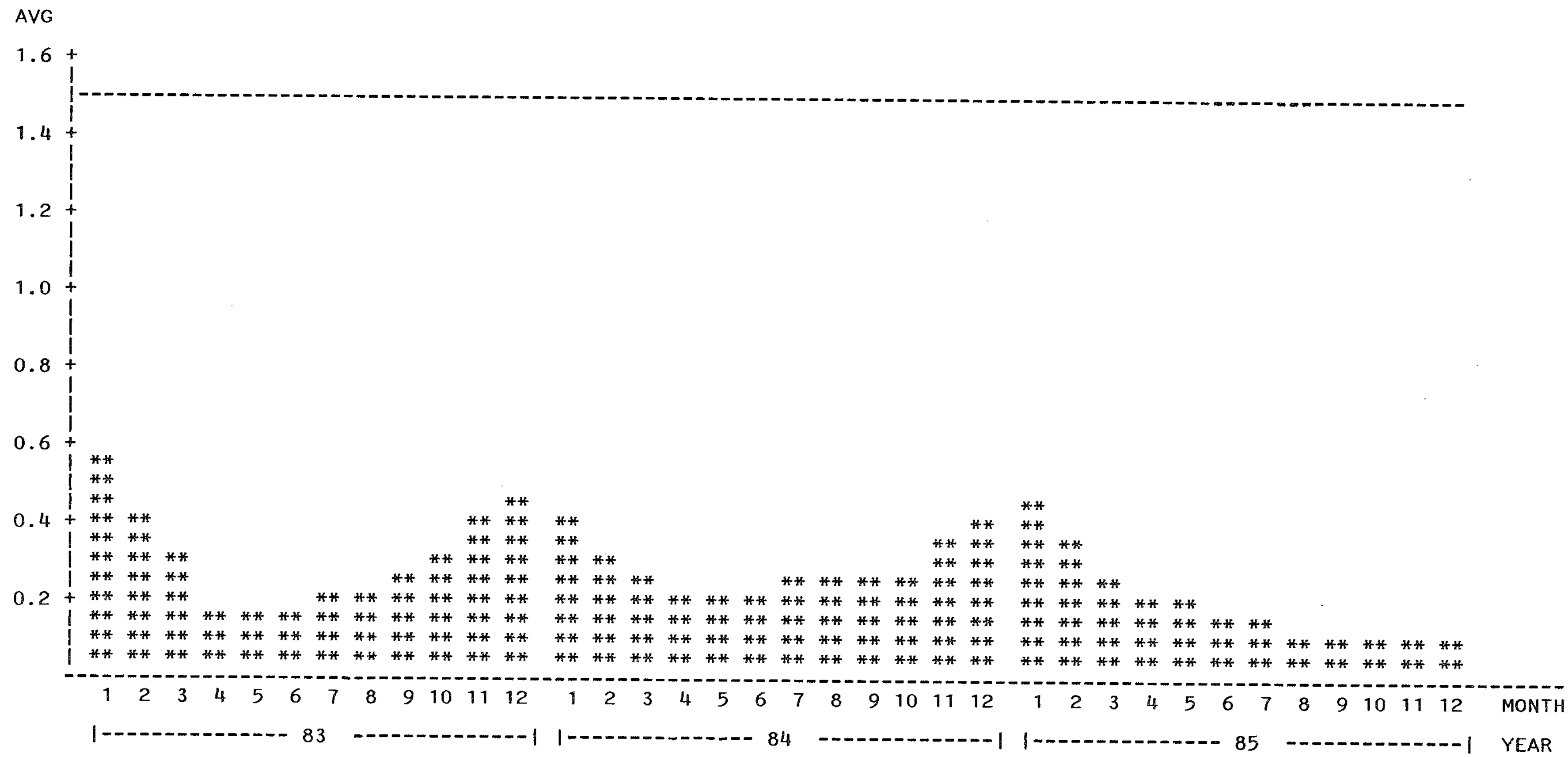


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WATERBURY 007

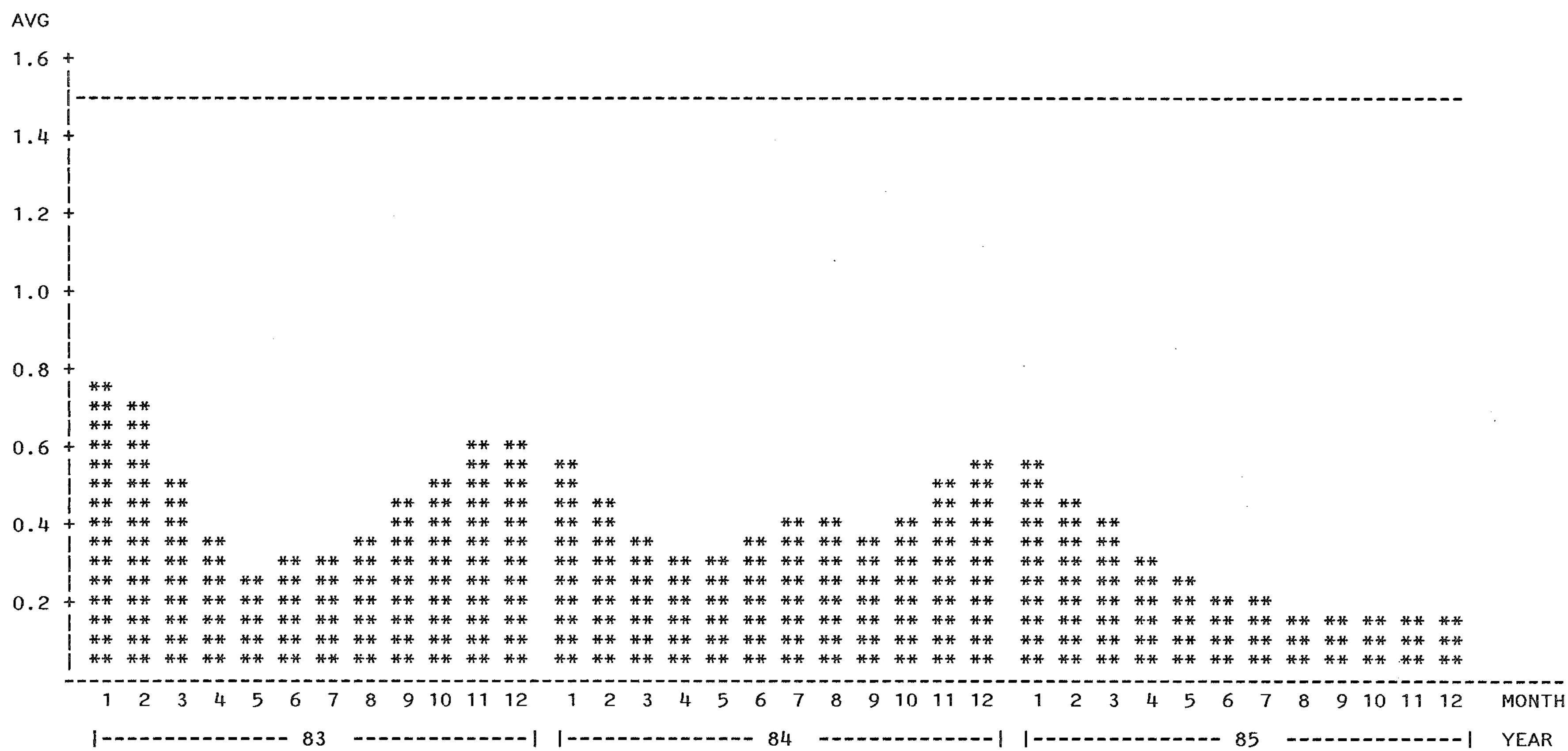


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WATERBURY 123

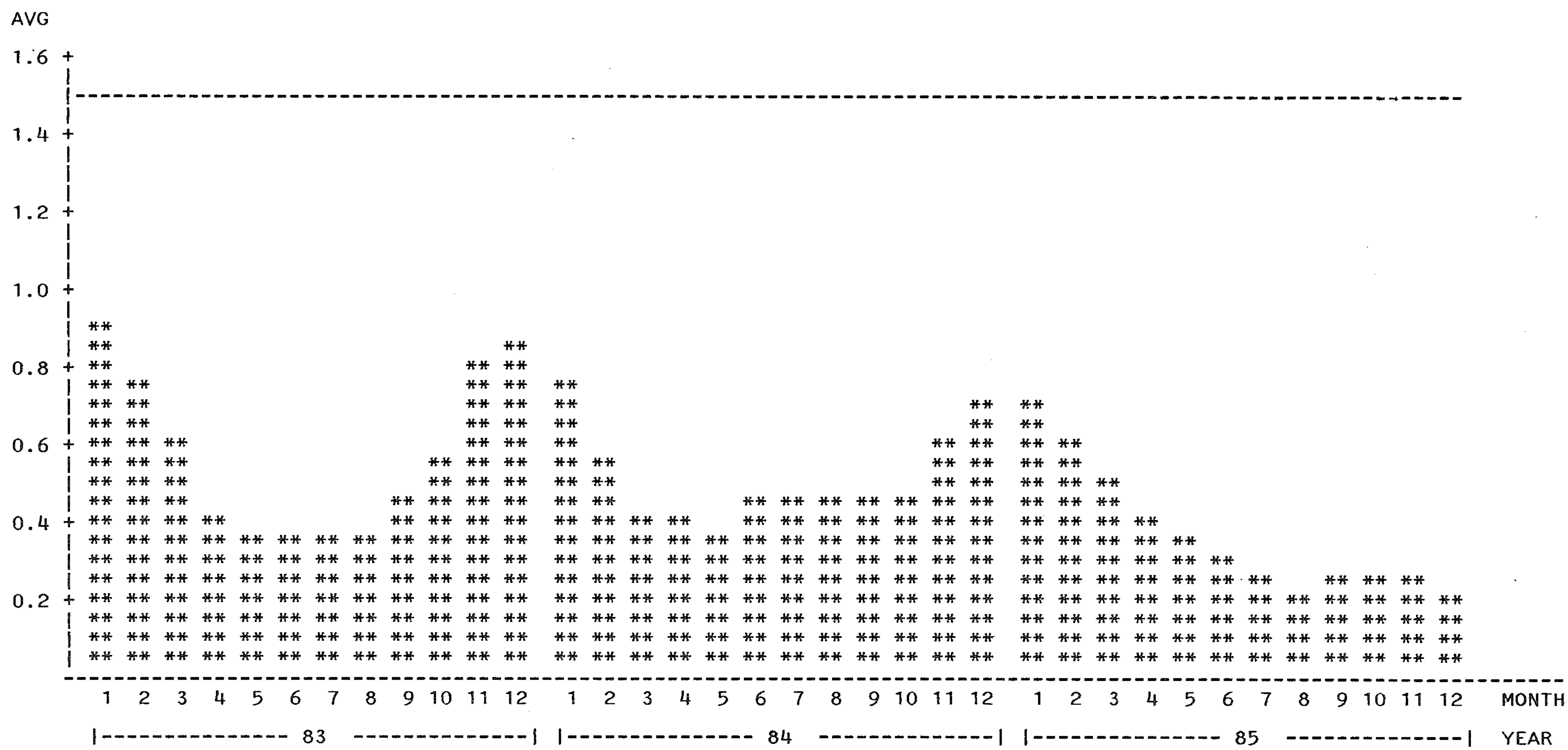


FIGURE 16, CONTINUED

3-MONTH RUNNING AVERAGES FOR LEAD

STATION=WEST HAVEN 003

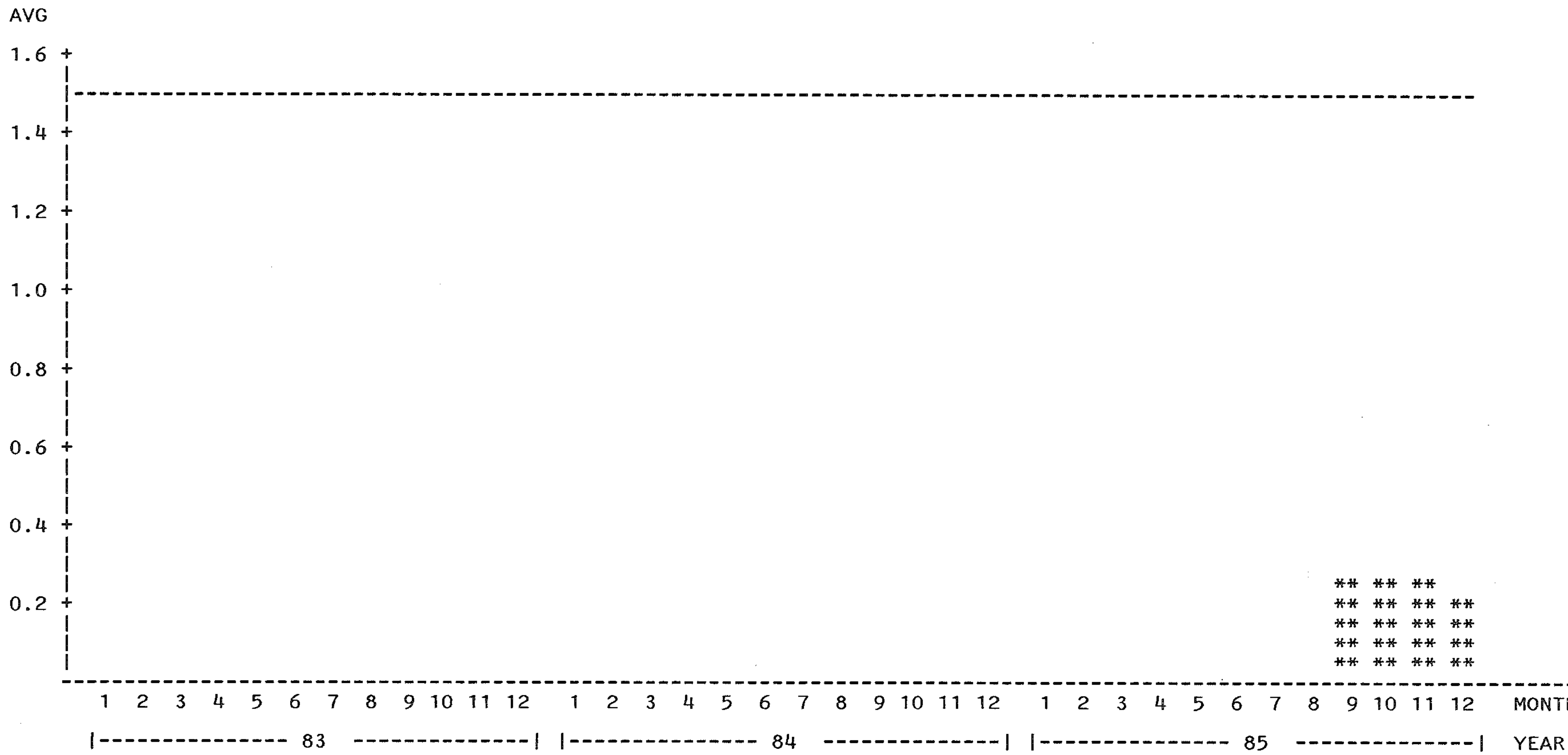


FIGURE C

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: BRIDGEPORT-123

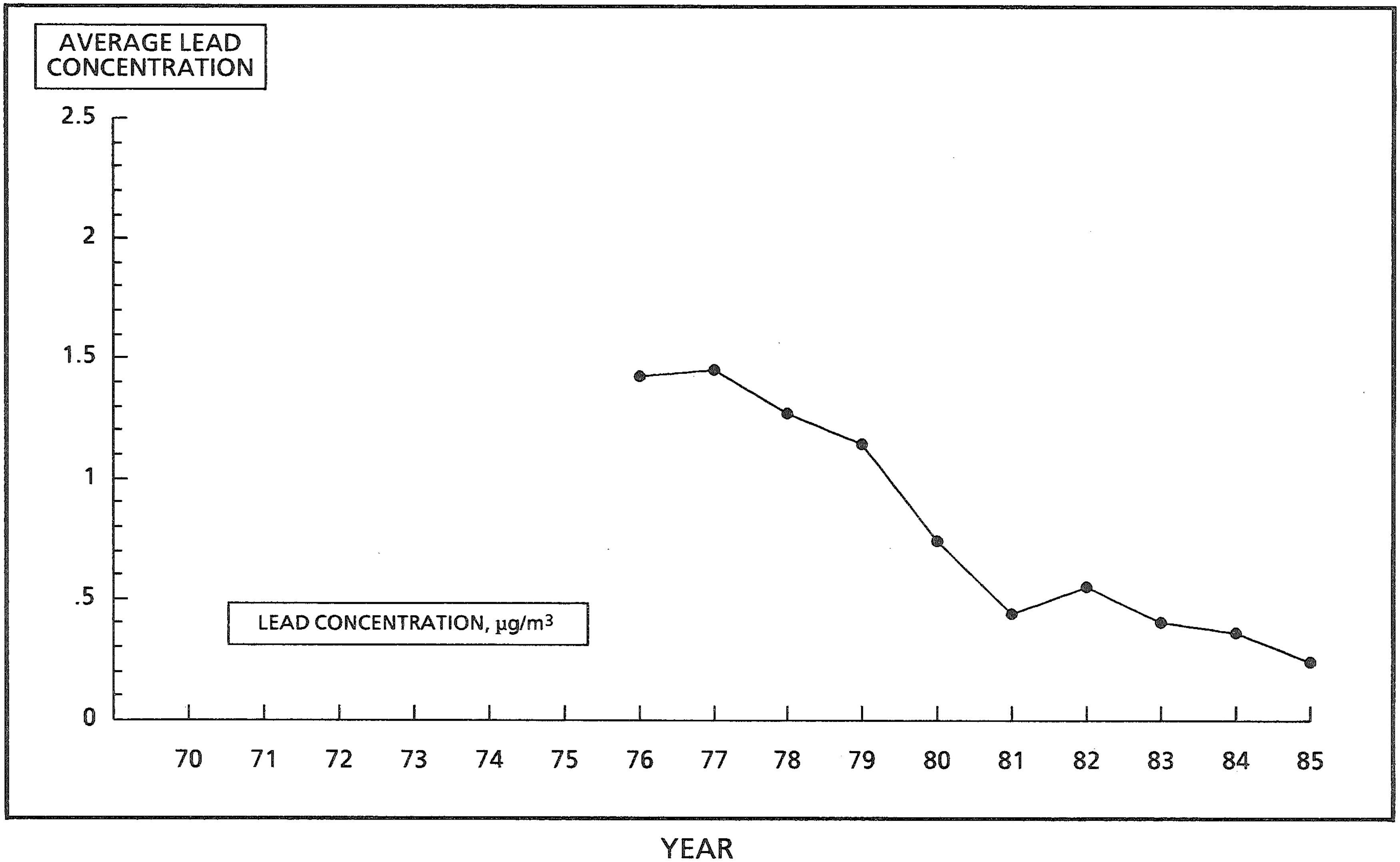


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: BRISTOL-001

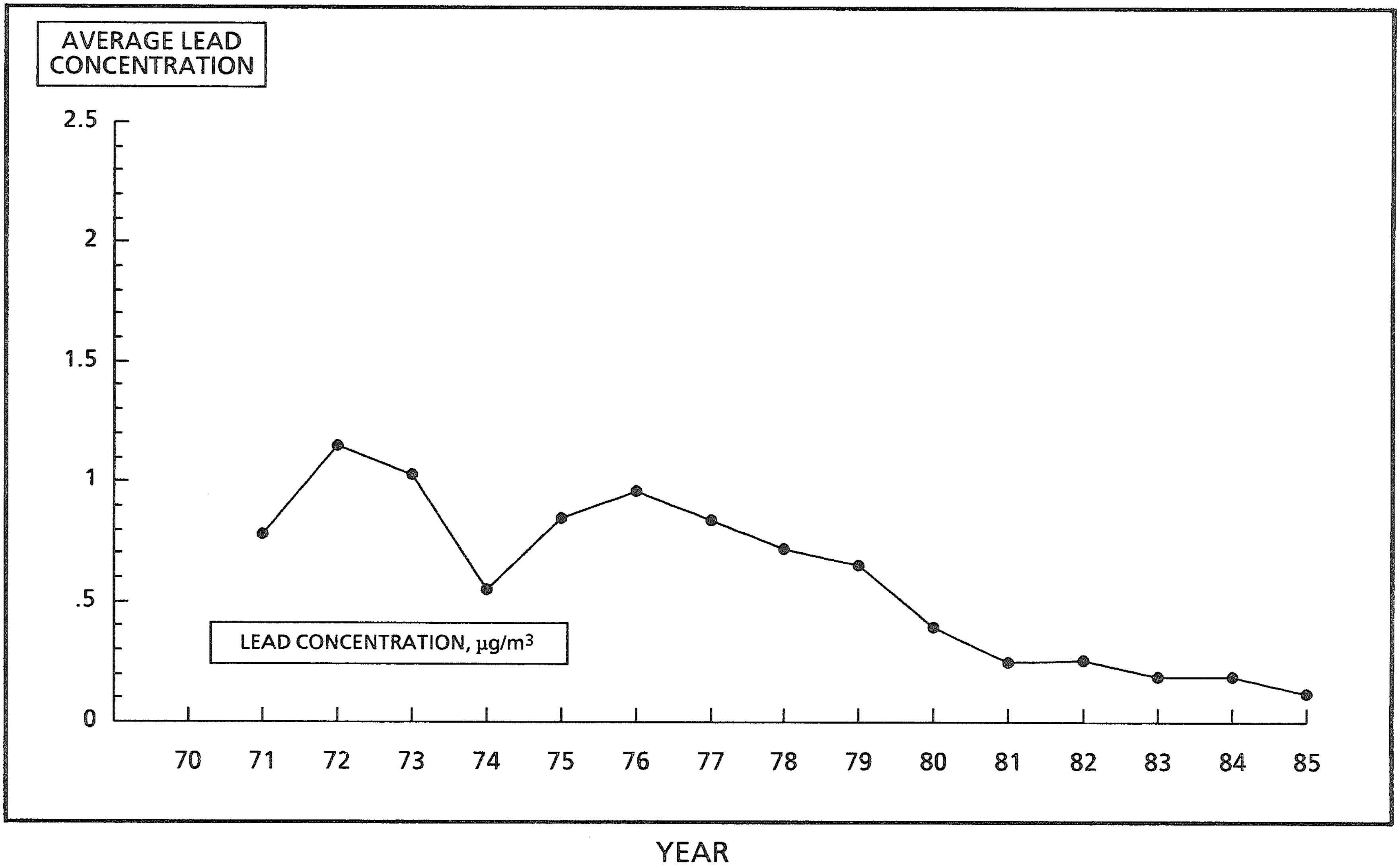


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: MERIDEN-002

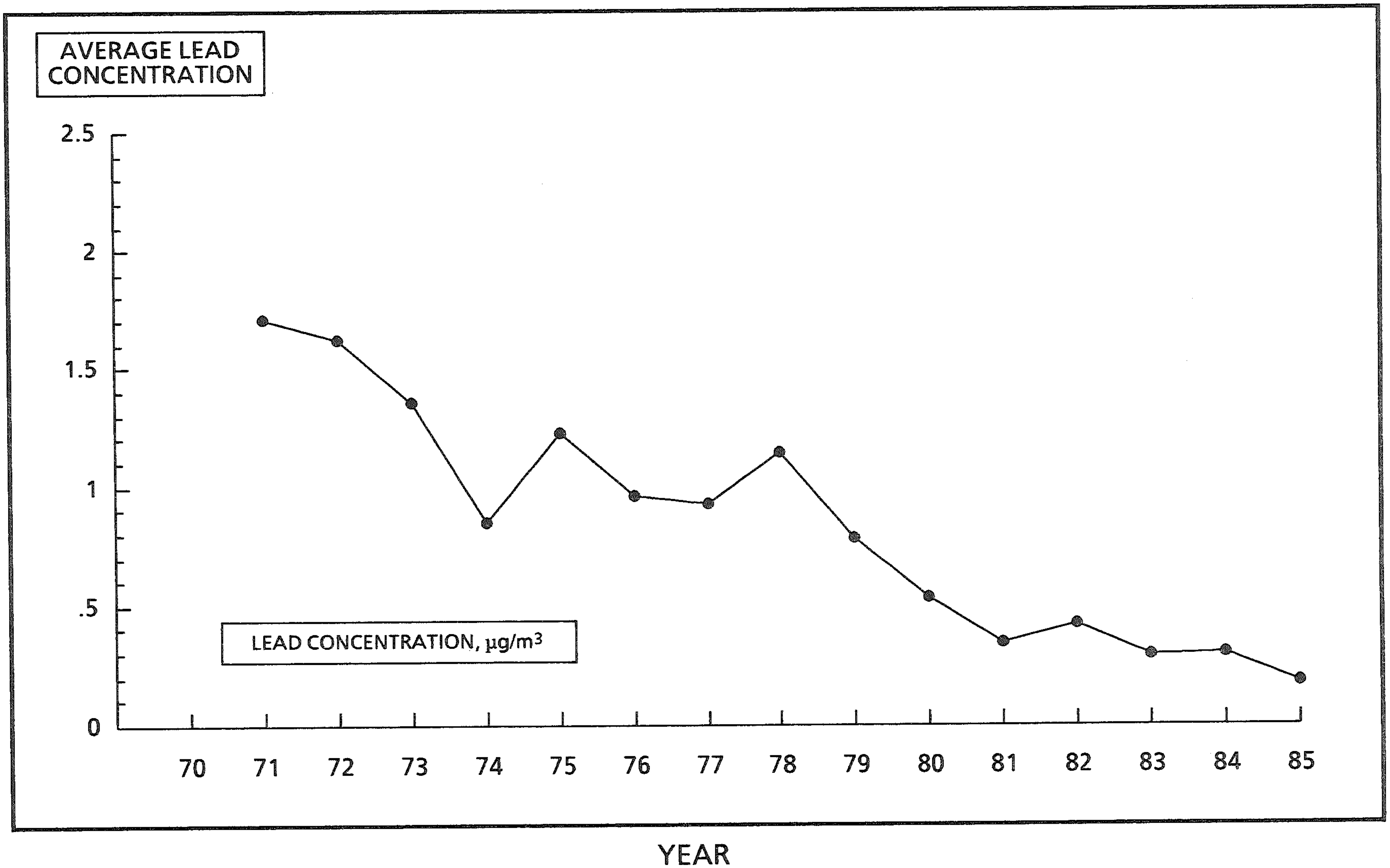


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: MIDDLETOWN-003

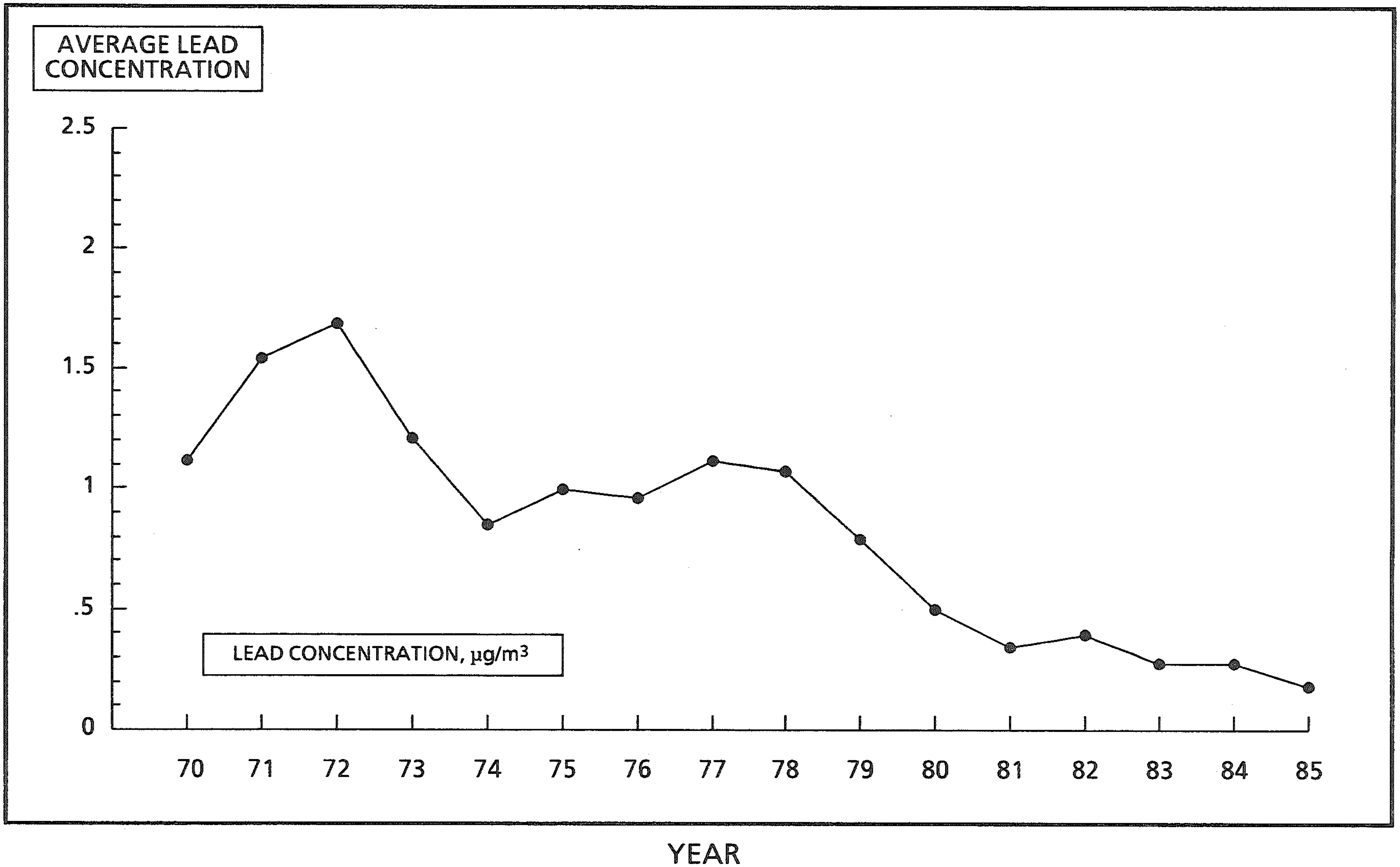


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE:NEW HAVEN-123

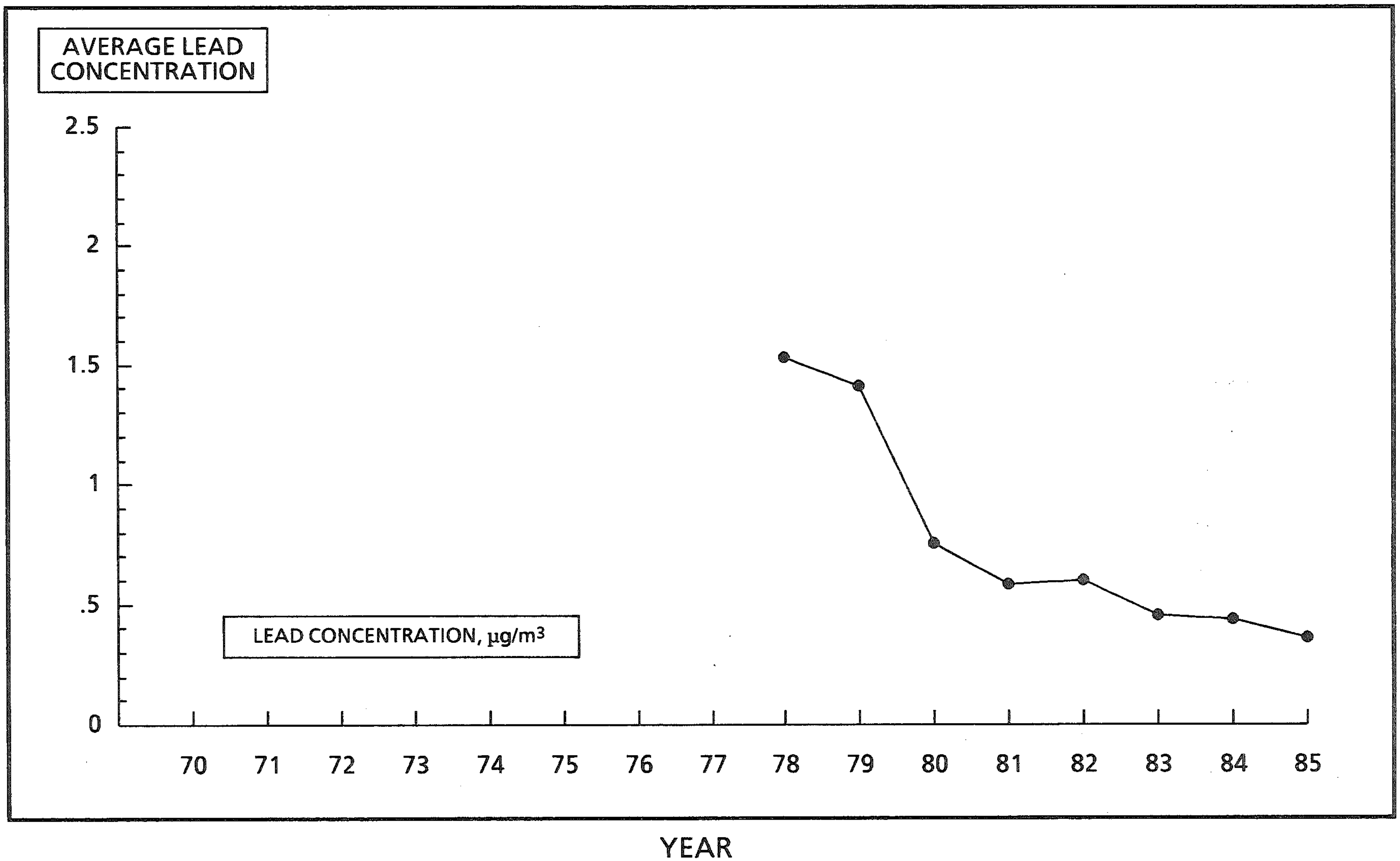


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: WALLINGFORD-001

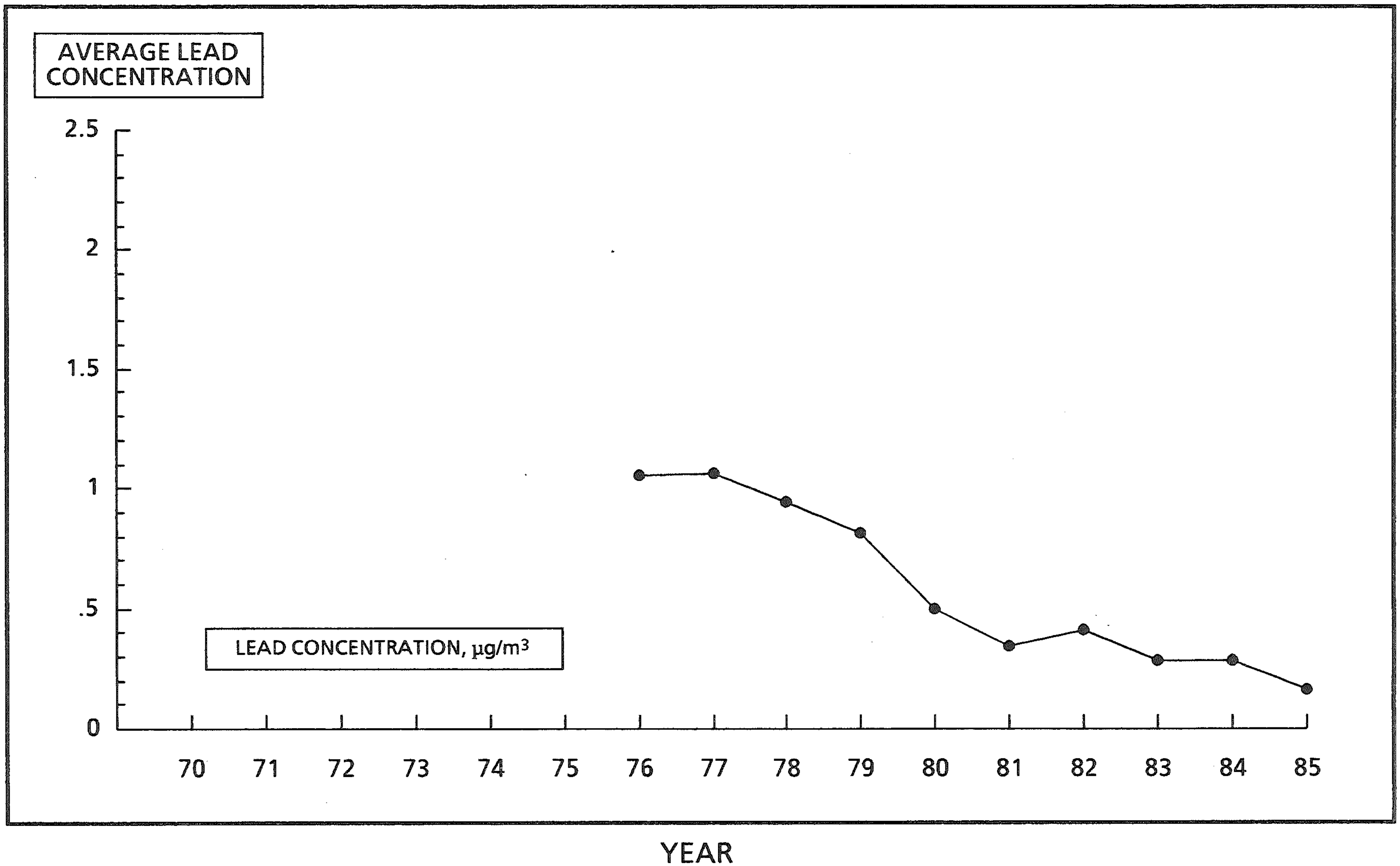


FIGURE C, CONTINUED

ANNUAL AVERAGE LEAD CONCENTRATIONS

SITE: WATERBURY-123

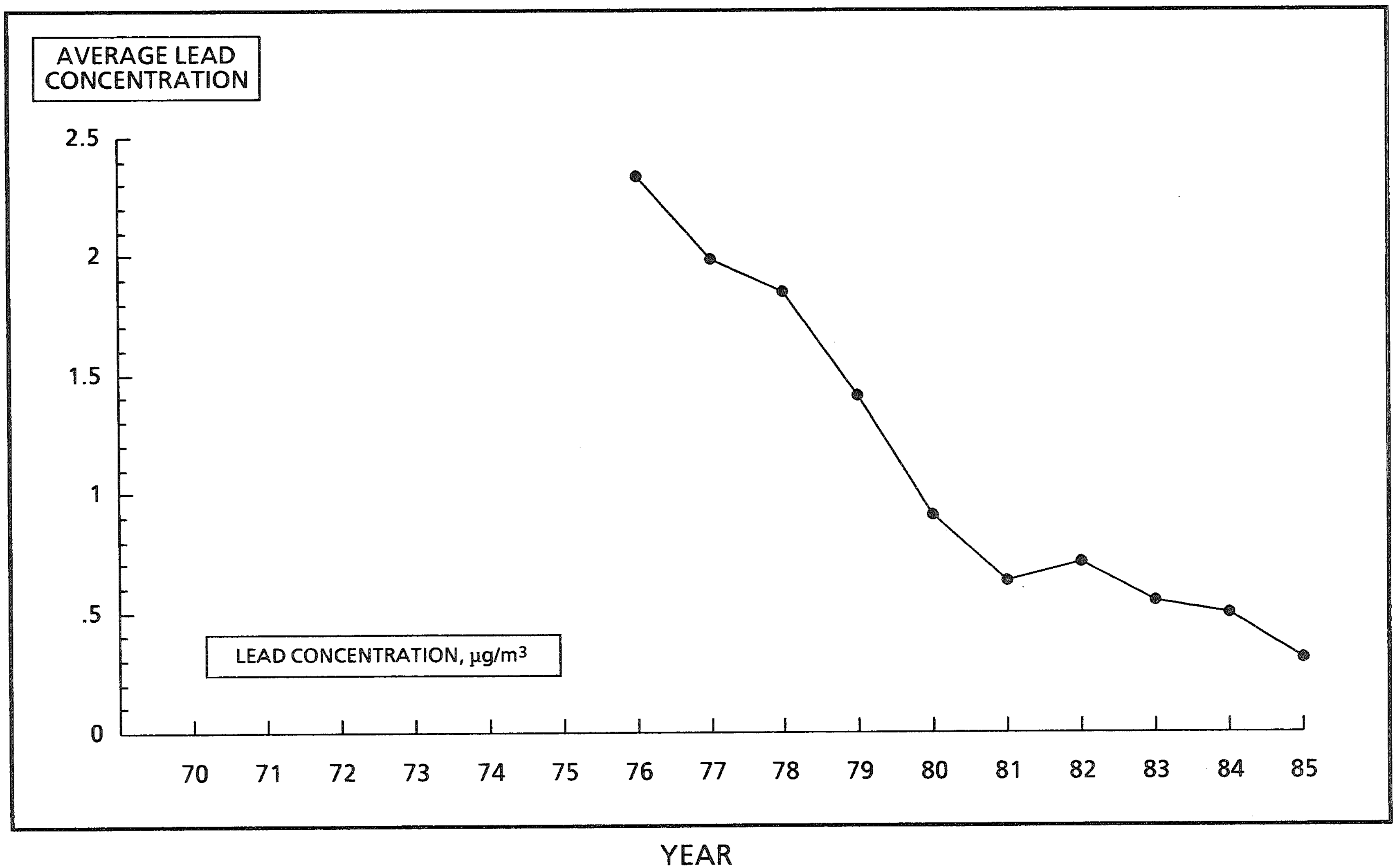


FIGURE D

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: BRIDGEPORT-123

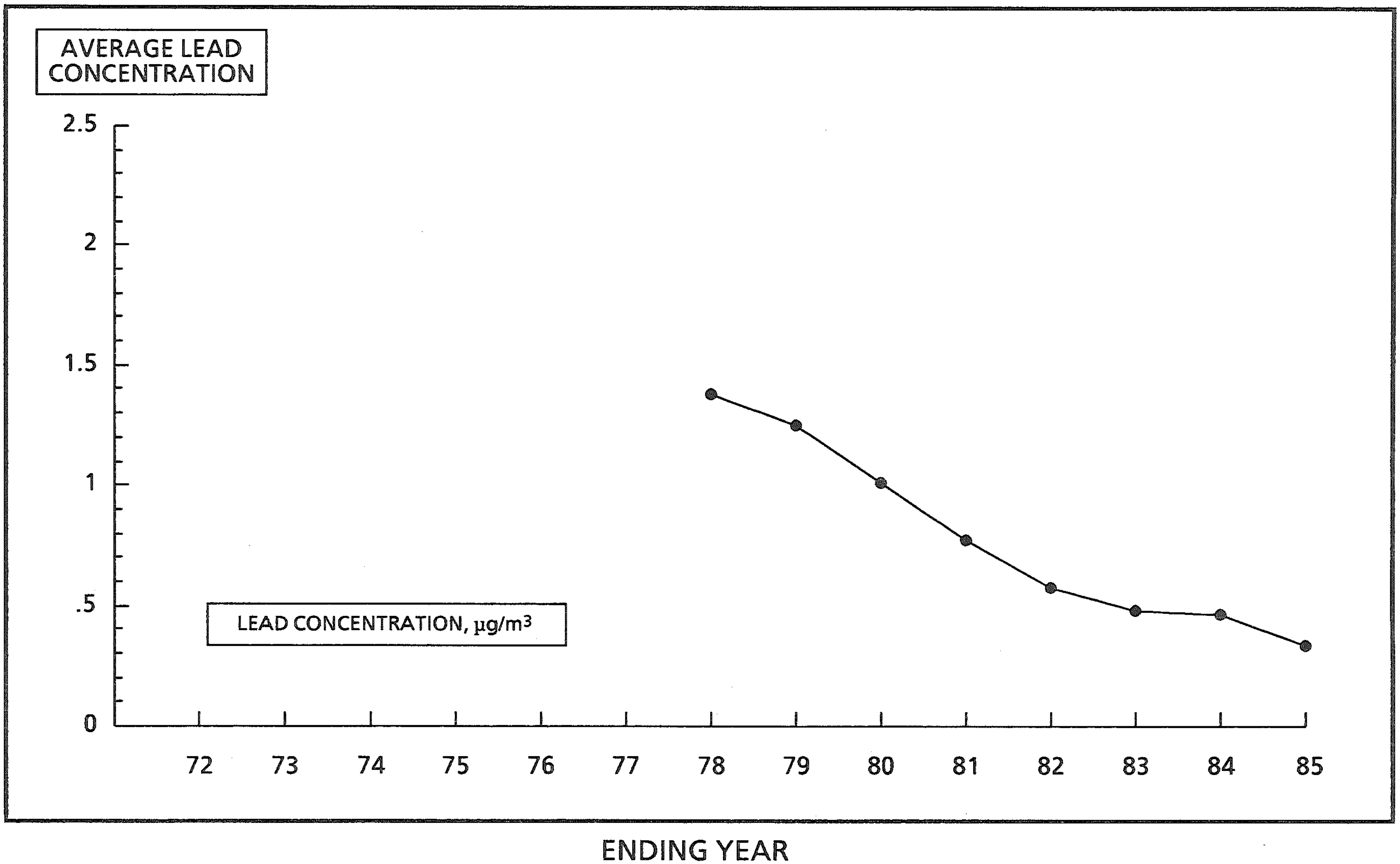


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: BRISTOL-001

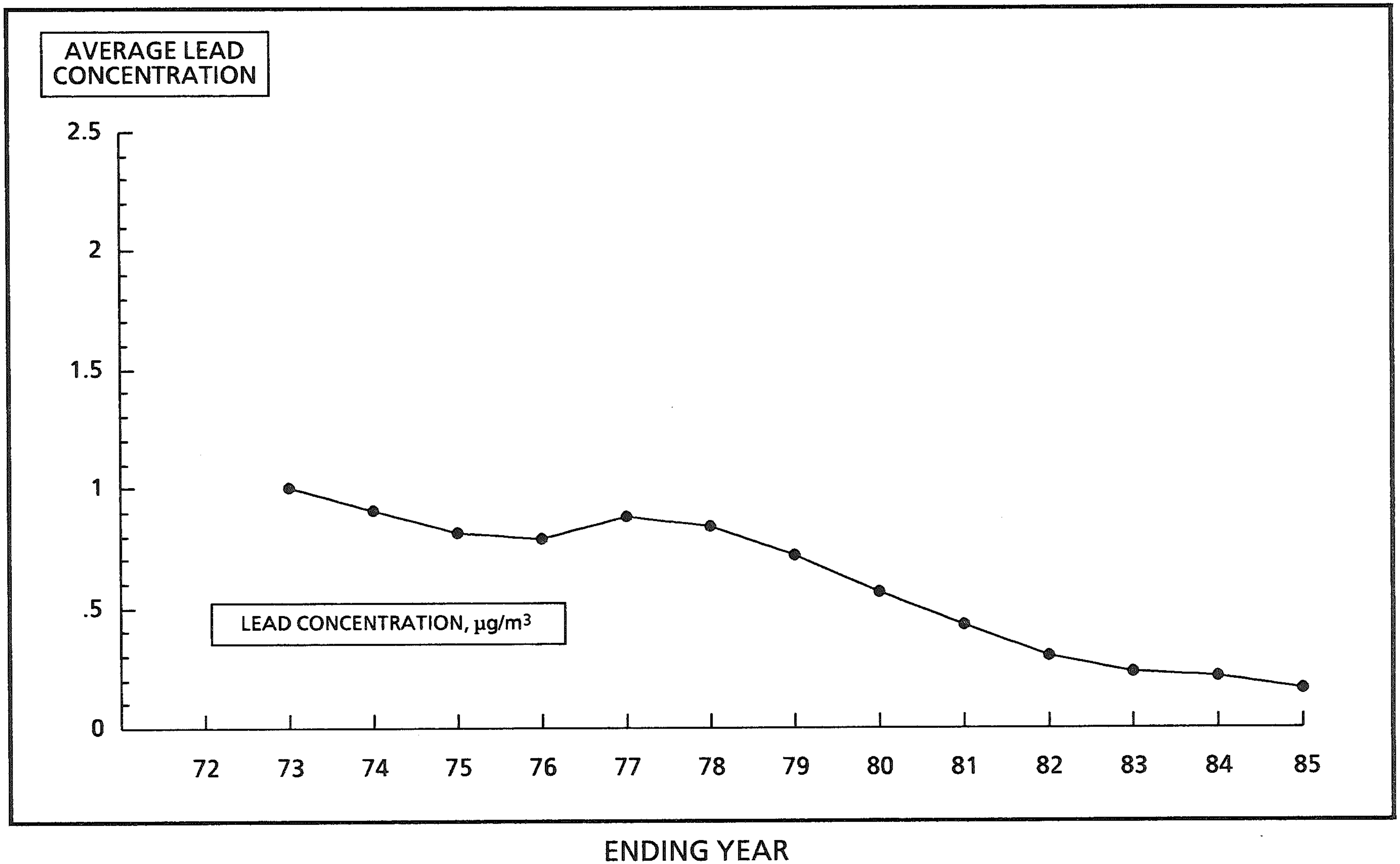


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: MERIDEN-002

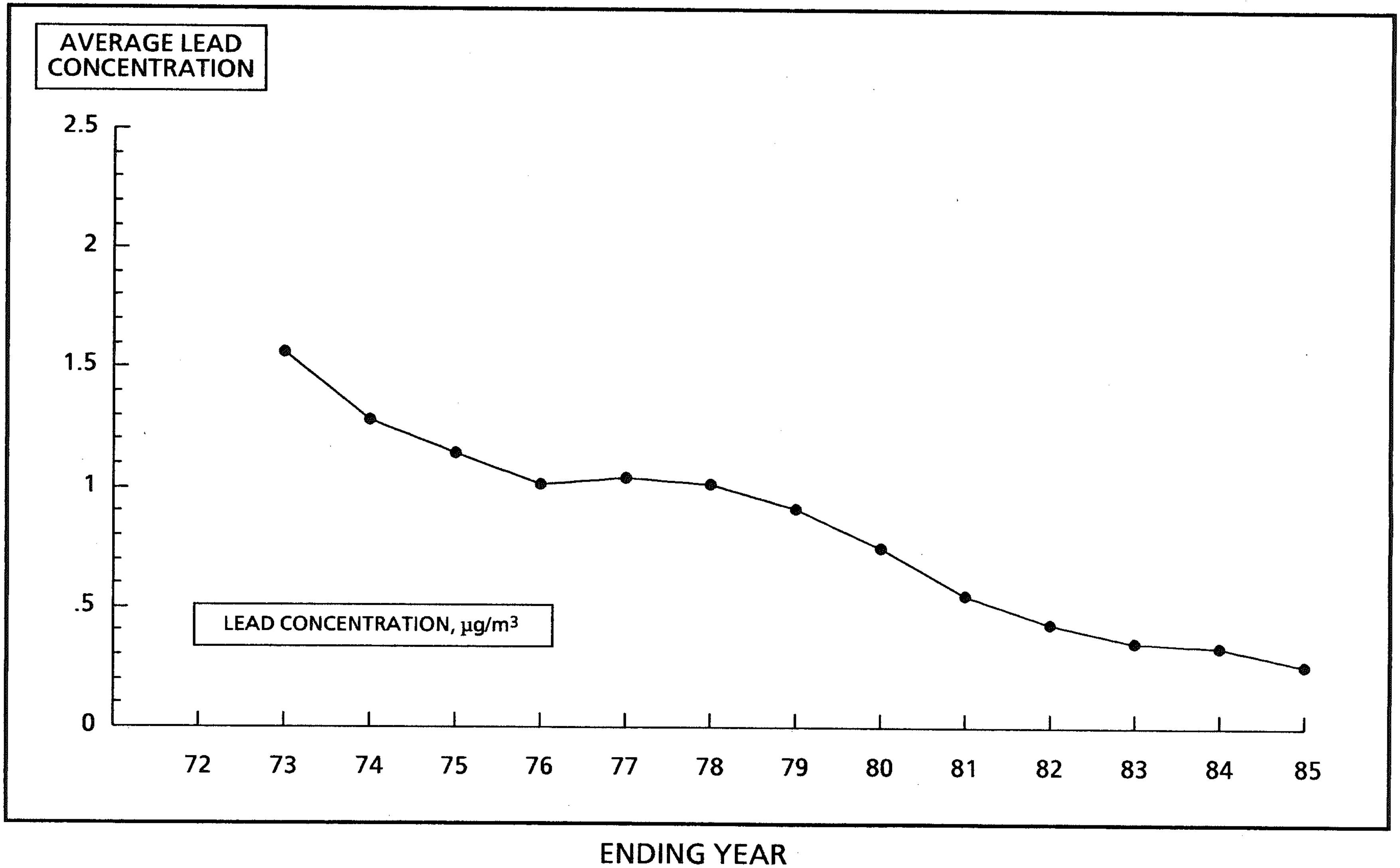


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: MIDDLETOWN-003

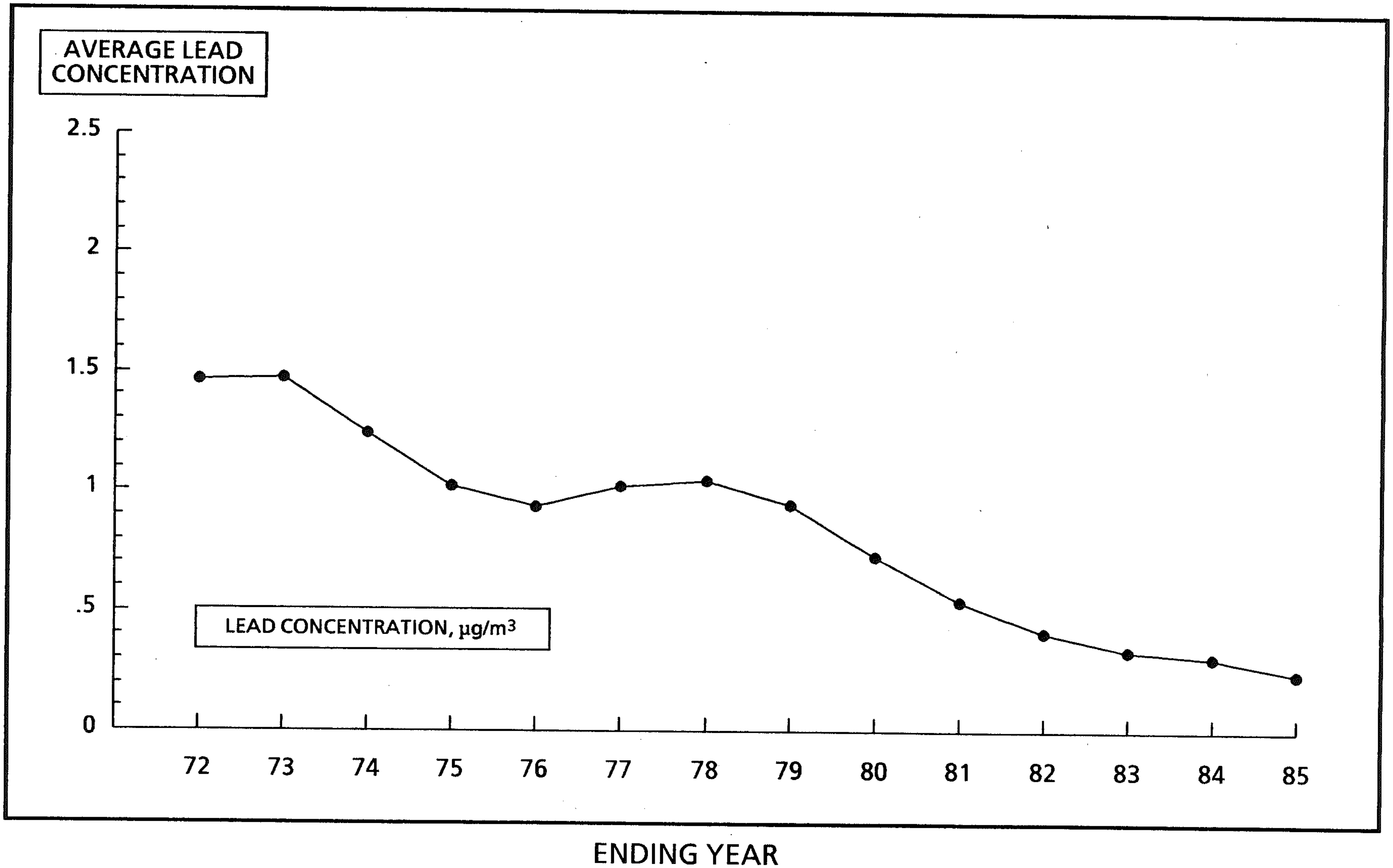


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: NEW HAVEN-123

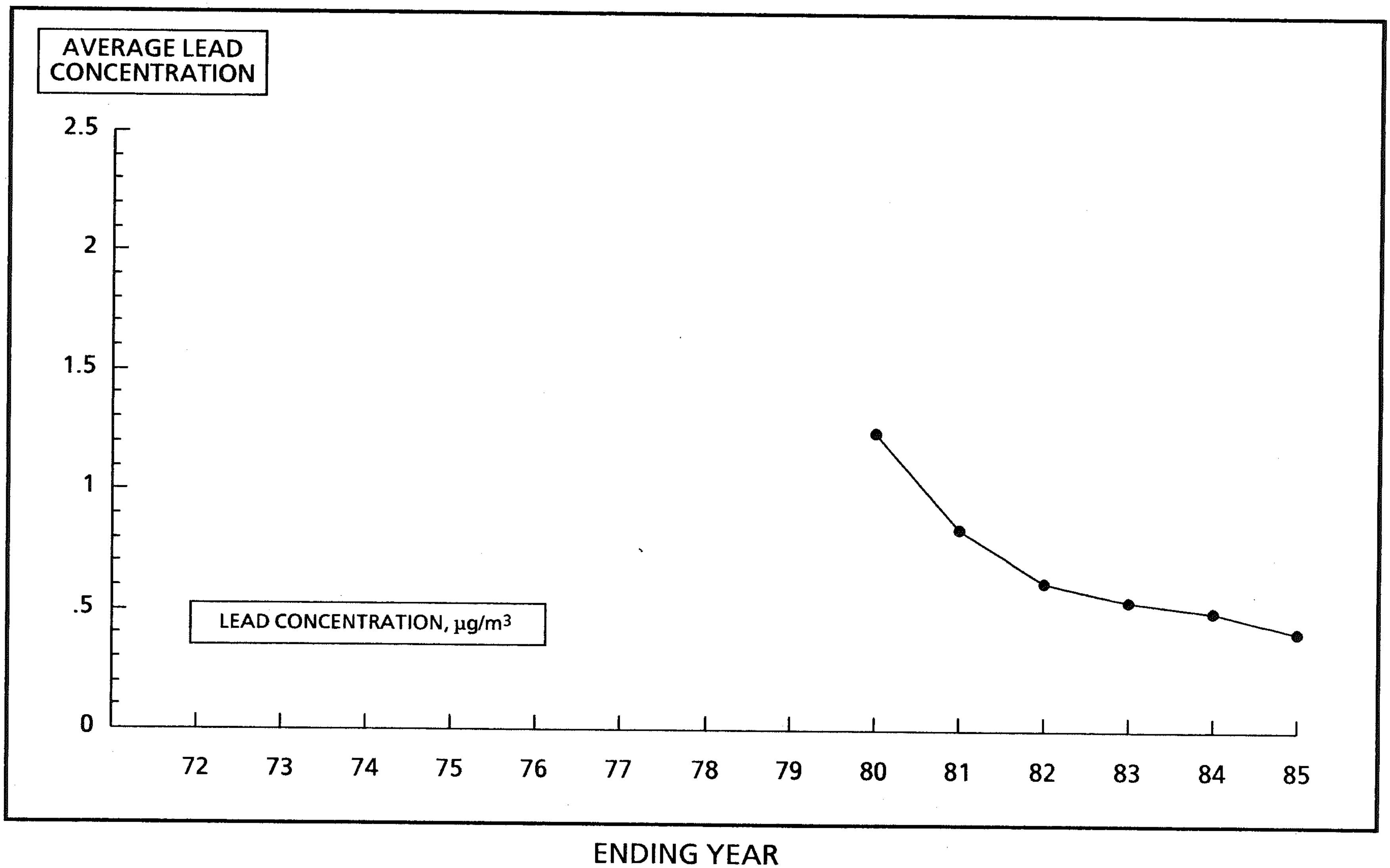
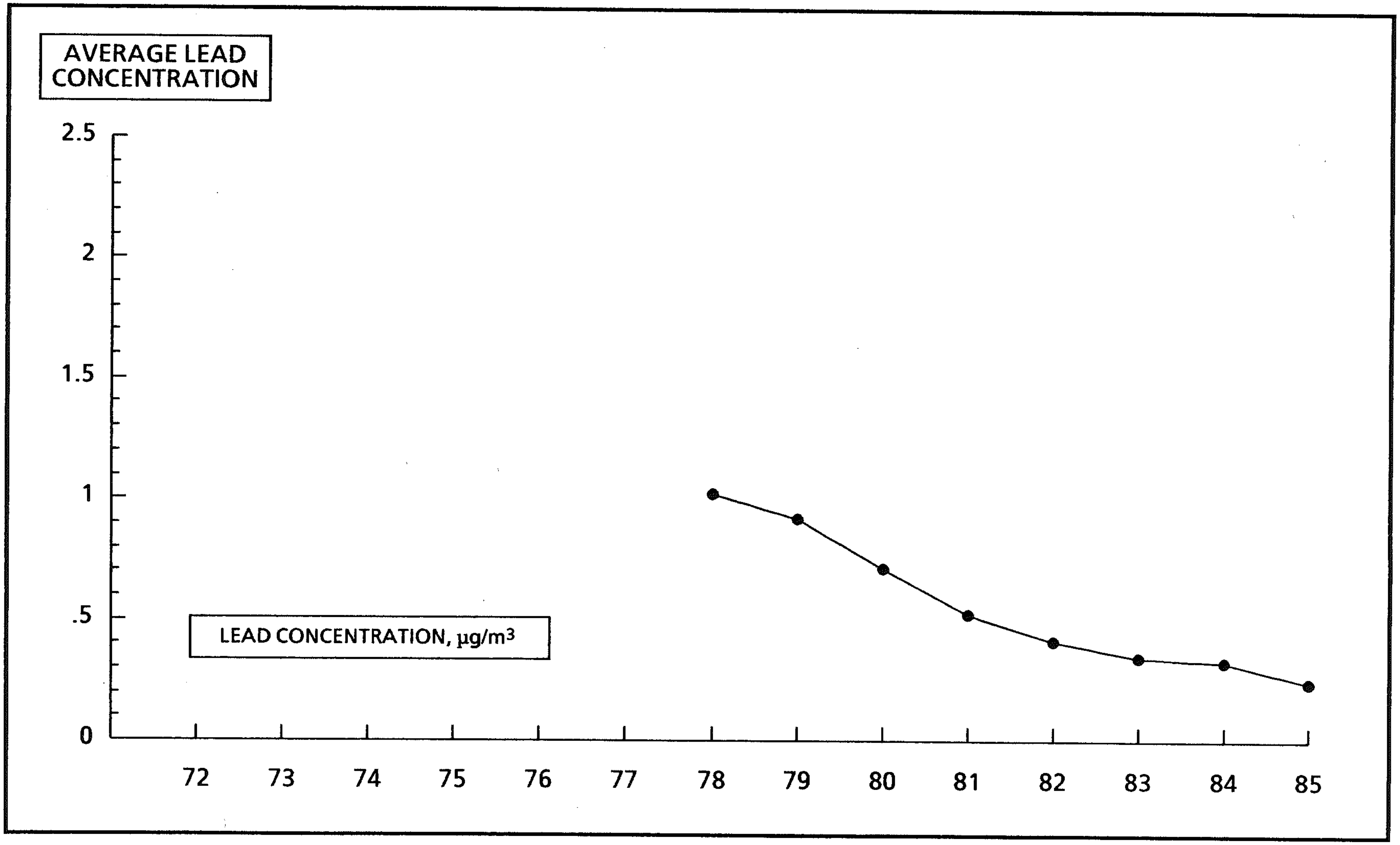


FIGURE D, CONTINUED

3-YEAR RUNNING AVERAGE LEAD CONCENTRATIONS

SITE: WALLINGFORD-001

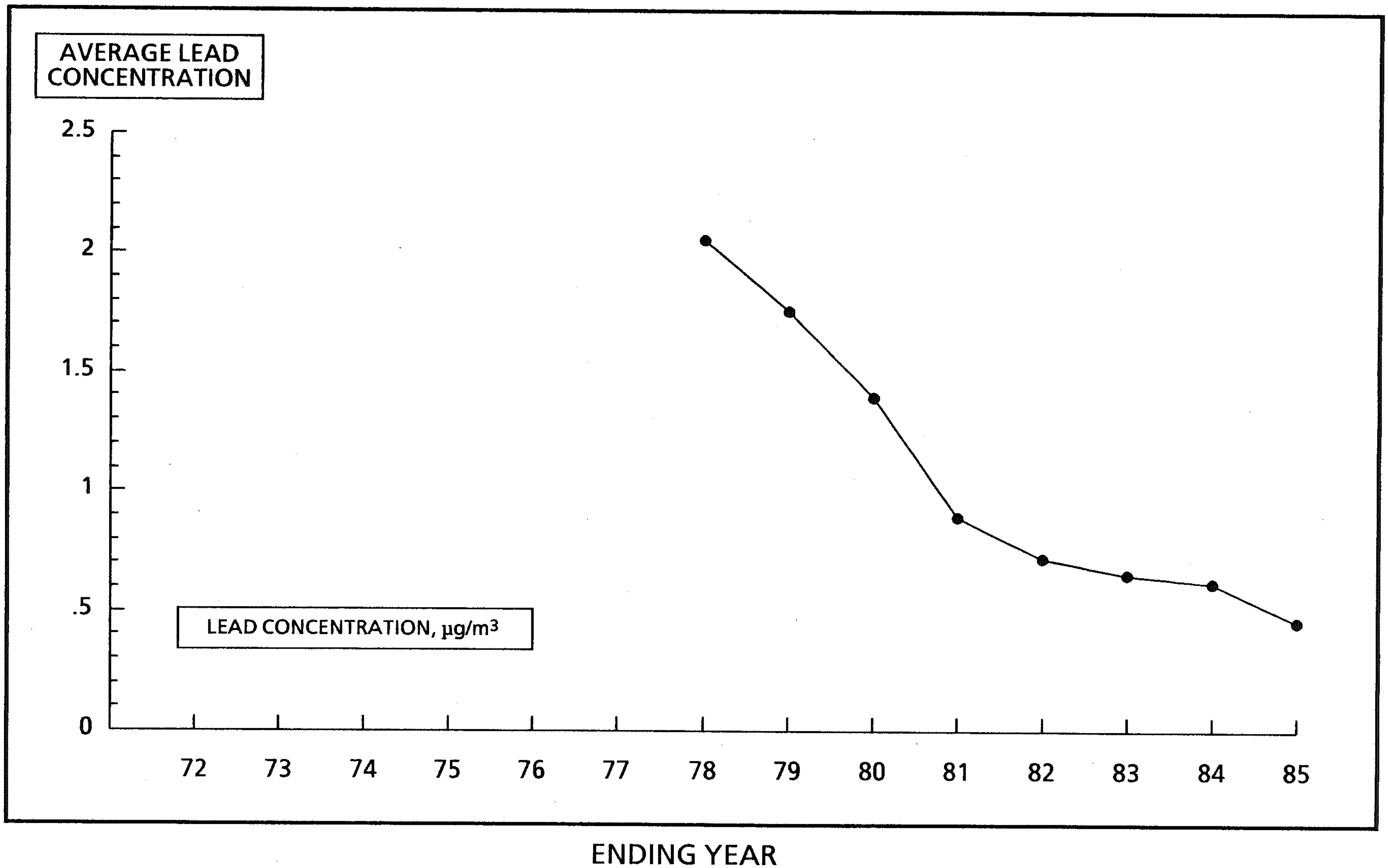


ENDING YEAR

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 a Geo Filter automatic wet-dry sensing precipitation collector. This collector is the same type as those 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.

In addition to the above equipment, a prototype precipitation quality monitor is being tested at the Plainfield site. Developed by the USGS Hydrologic Instrumentation Facility, the monitor consists of a wet-dry sensing precipitation collector fitted with a funnel in place of a collection container. Precipitation flows from the funnel through tubing to a series of sensors. The sensors continuously measure pH, temperature and specific conductance throughout a precipitation event and record the data at pre-selected intervals. Precipitation quantity is measured by a tipping-bucket type rain gage.

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, which is a measure of the ions in solution -- the dissolved solids in solution -- which is a measure 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. The results for 1985 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 24 percent of all the precipitation events studied to date have had a pH of 4.0 or below. Moreover, the yearly percentage of these low pH occurrences has increased significantly over the last three years from 20% in 1983 to 32% in 1985. 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) 722-2528, or from the Natural Resources Center, Department of Environmental Protection, 165 Capitol Avenue, Hartford, Connecticut 06106 at (203) 566-3540.

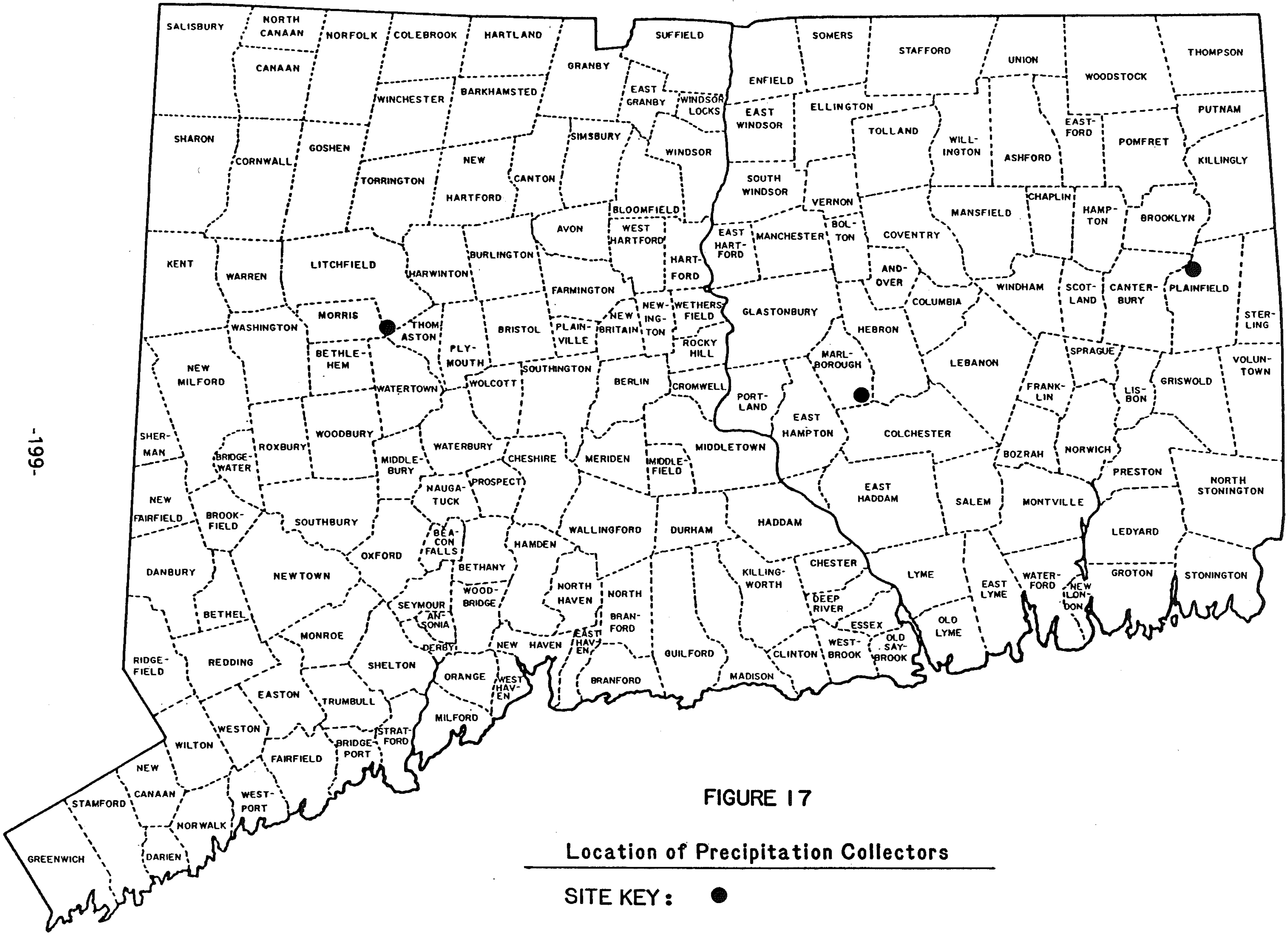


FIGURE 17

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

* Water equivalent of snowfall

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

* Water equivalent of snowfall

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*

* Water equivalent of snowfall

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*

* Water equivalent of snowfall

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*

* Water equivalent of snowfall

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

* Water equivalent of snowfall

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*

* Water equivalent of snowfall

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

* Water equivalent of snowfall

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

* Water equivalent of snowfall

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*

* Water equivalent of snowfall

FIGURE 18

INCHES OF PRECIPITATION

PLAINFIELD SITE, 1985

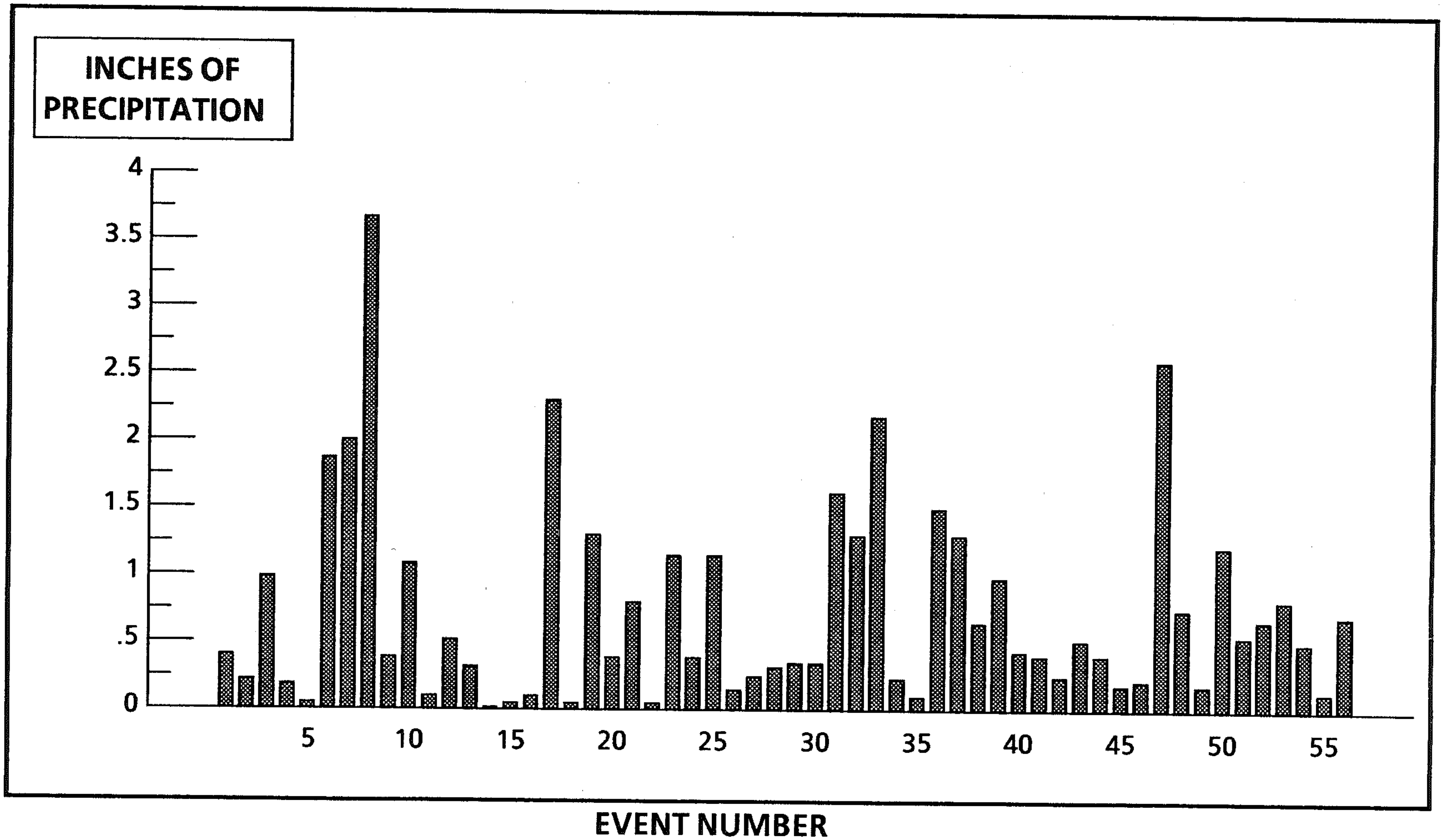
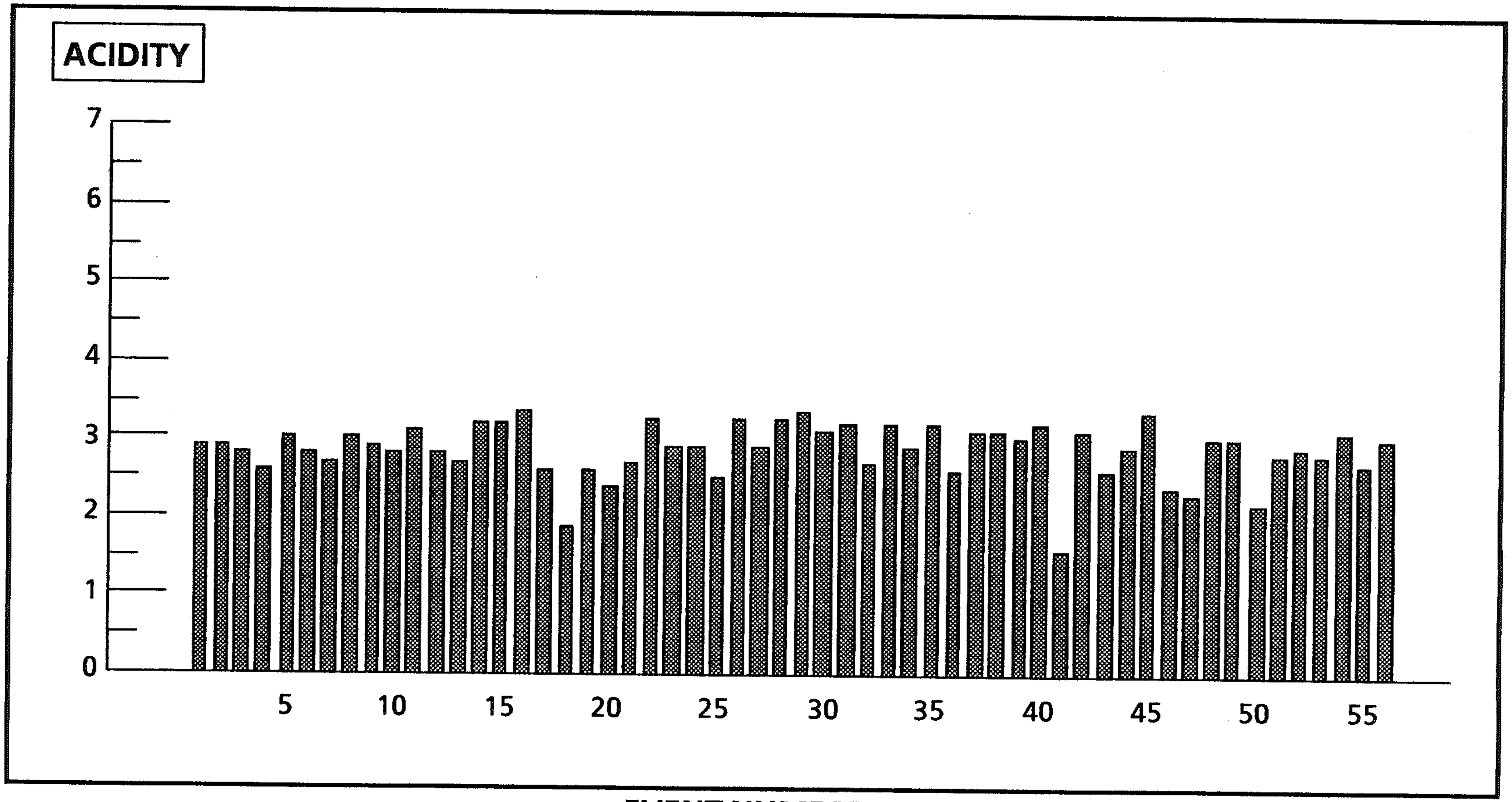


FIGURE 19

ACIDITY OF PRECIPITATION

PLAINFIELD SITE, 1985



ACIDITY = 7 - pH

FIGURE 20

SPECIFIC CONDUCTANCE OF PRECIPITATION

PLAINFIELD SITE, 1985

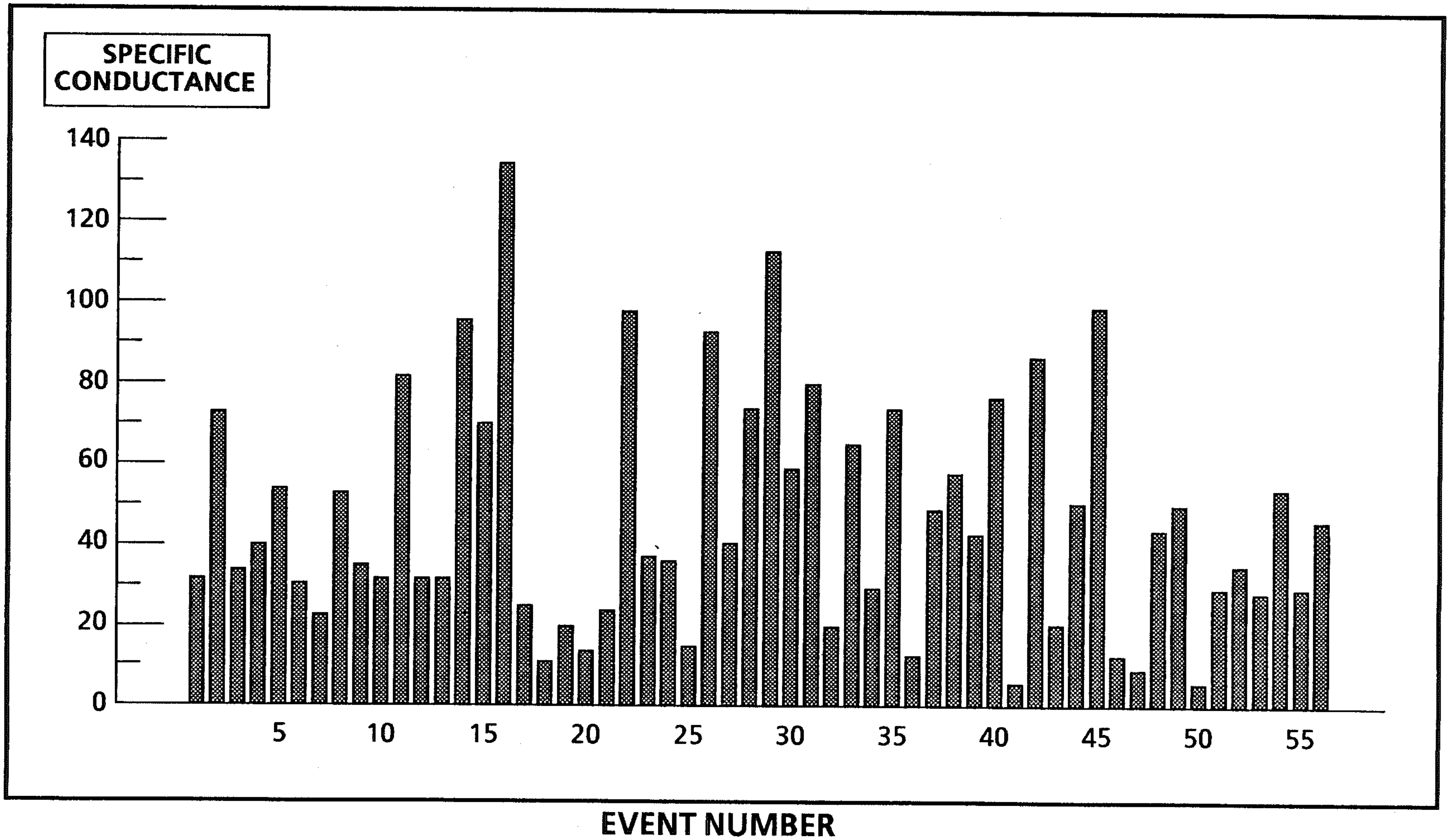


FIGURE 21

INCHES OF PRECIPITATION

MORRIS DAM SITE, 1985

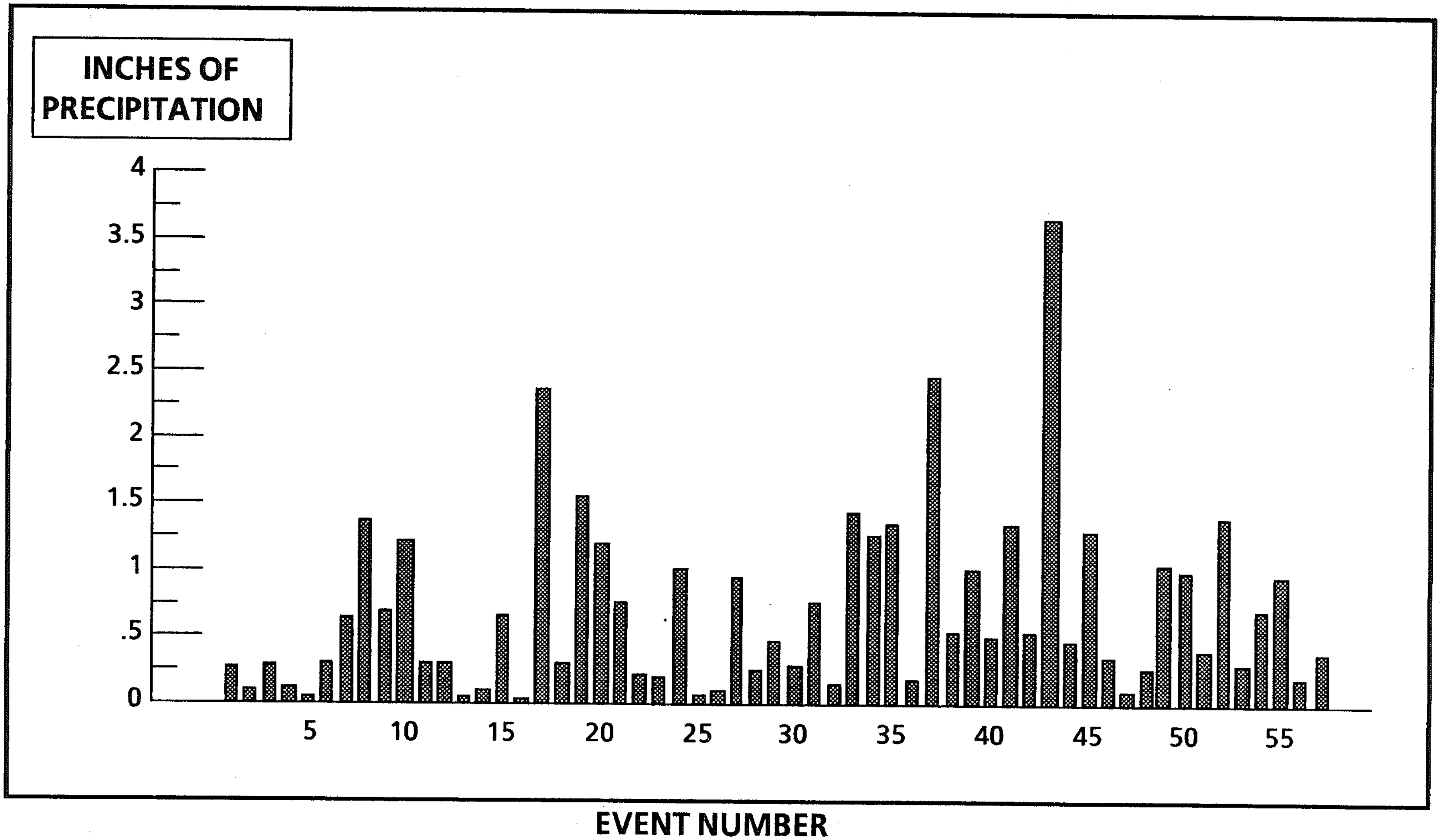
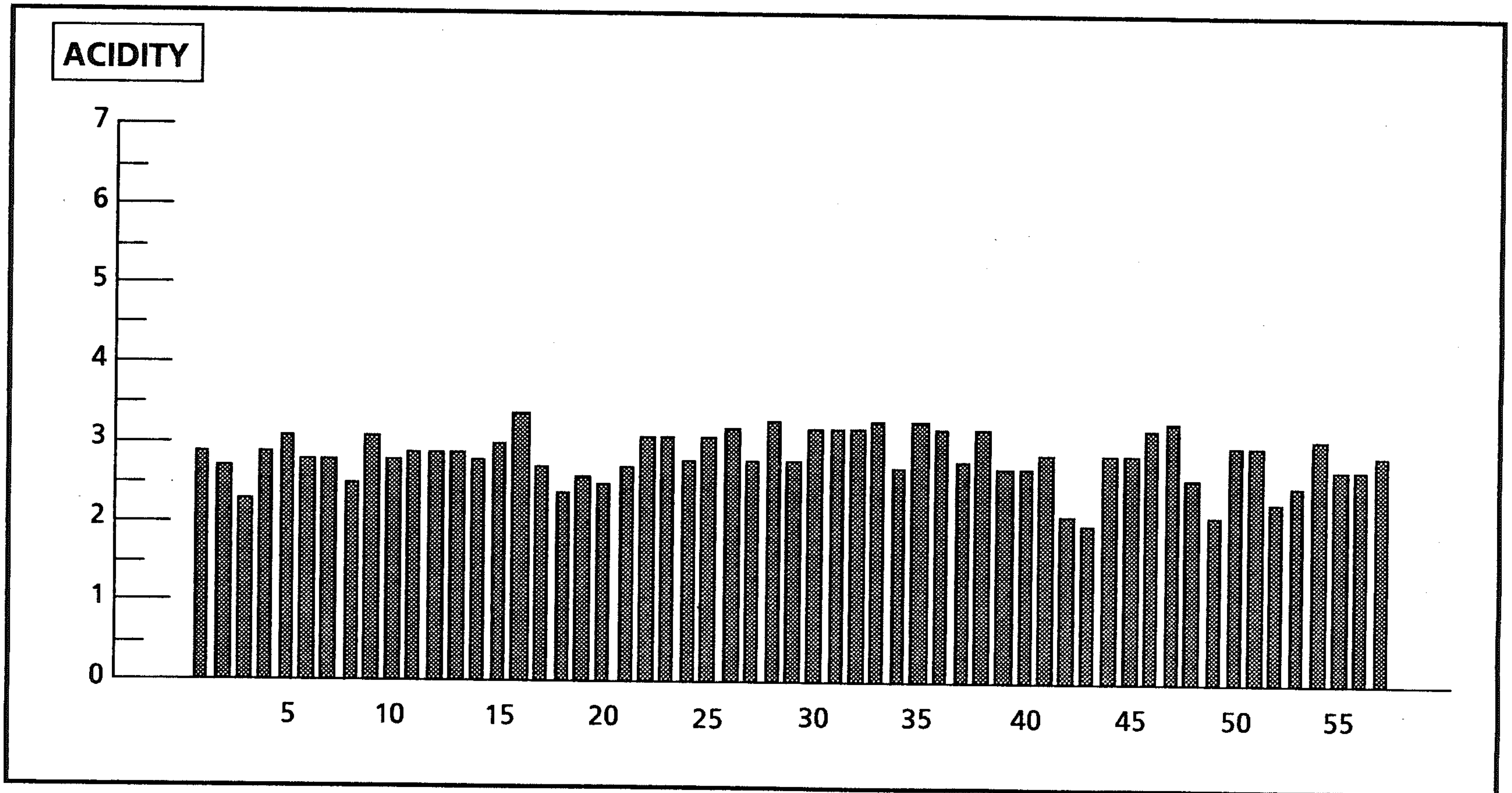


FIGURE 22

ACIDITY OF PRECIPITATION

MORRIS DAM SITE, 1985



ACIDITY = 7 - pH

FIGURE 23

SPECIFIC CONDUCTANCE OF PRECIPITATION

MORRIS DAM SITE, 1985

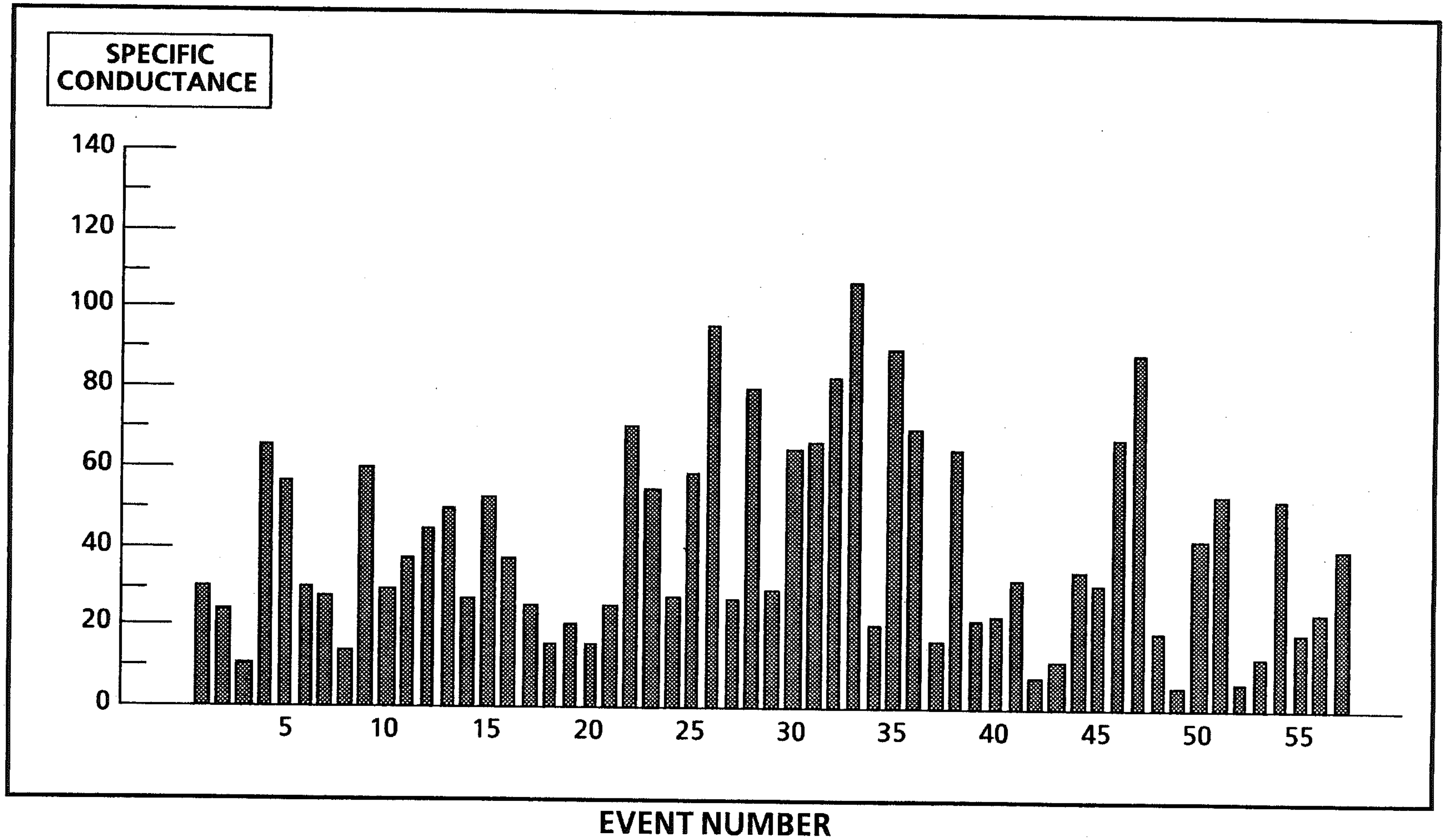


FIGURE 24

INCHES OF PRECIPITATION

MARLBOROUGH SITE, 1985

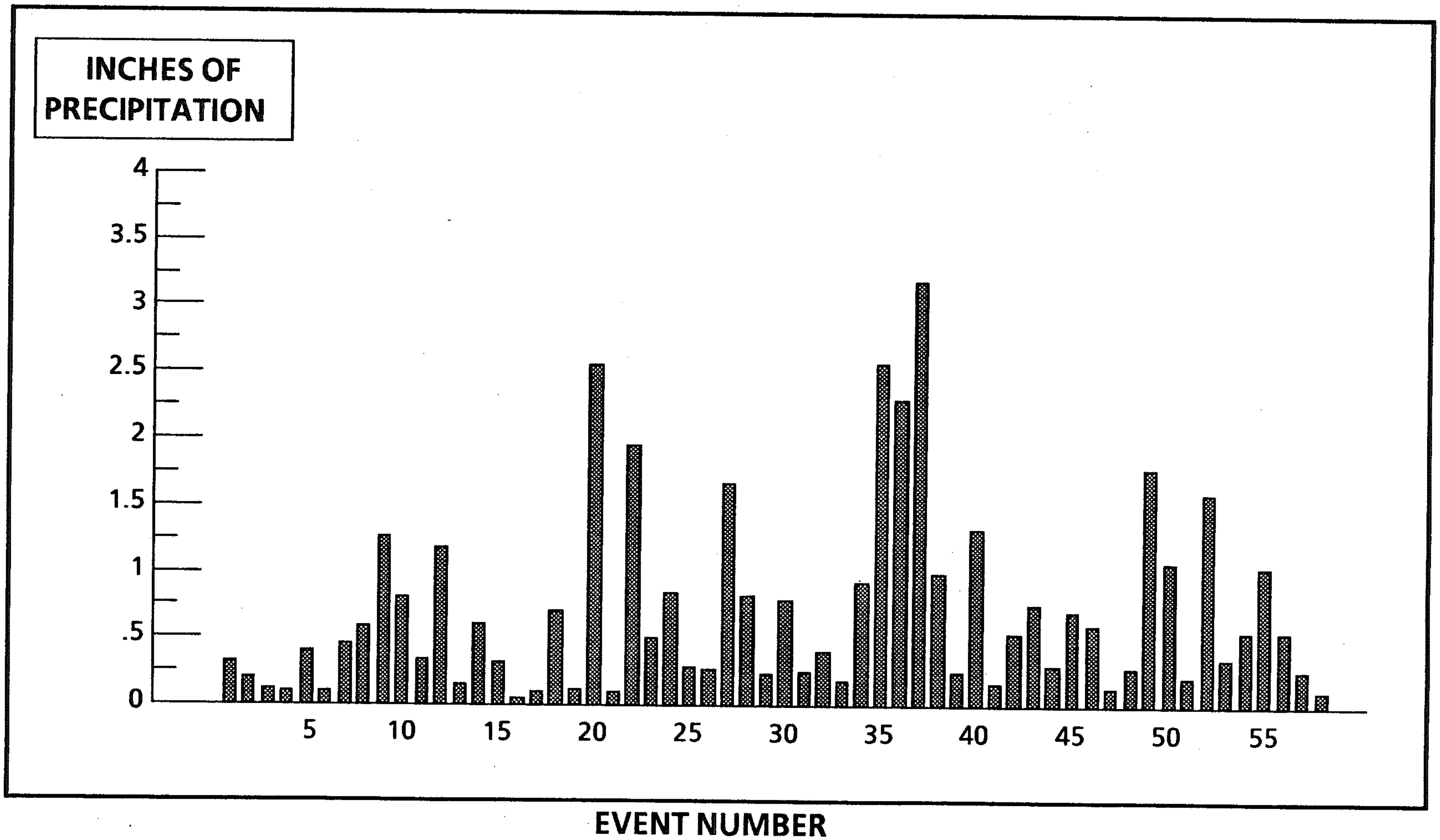
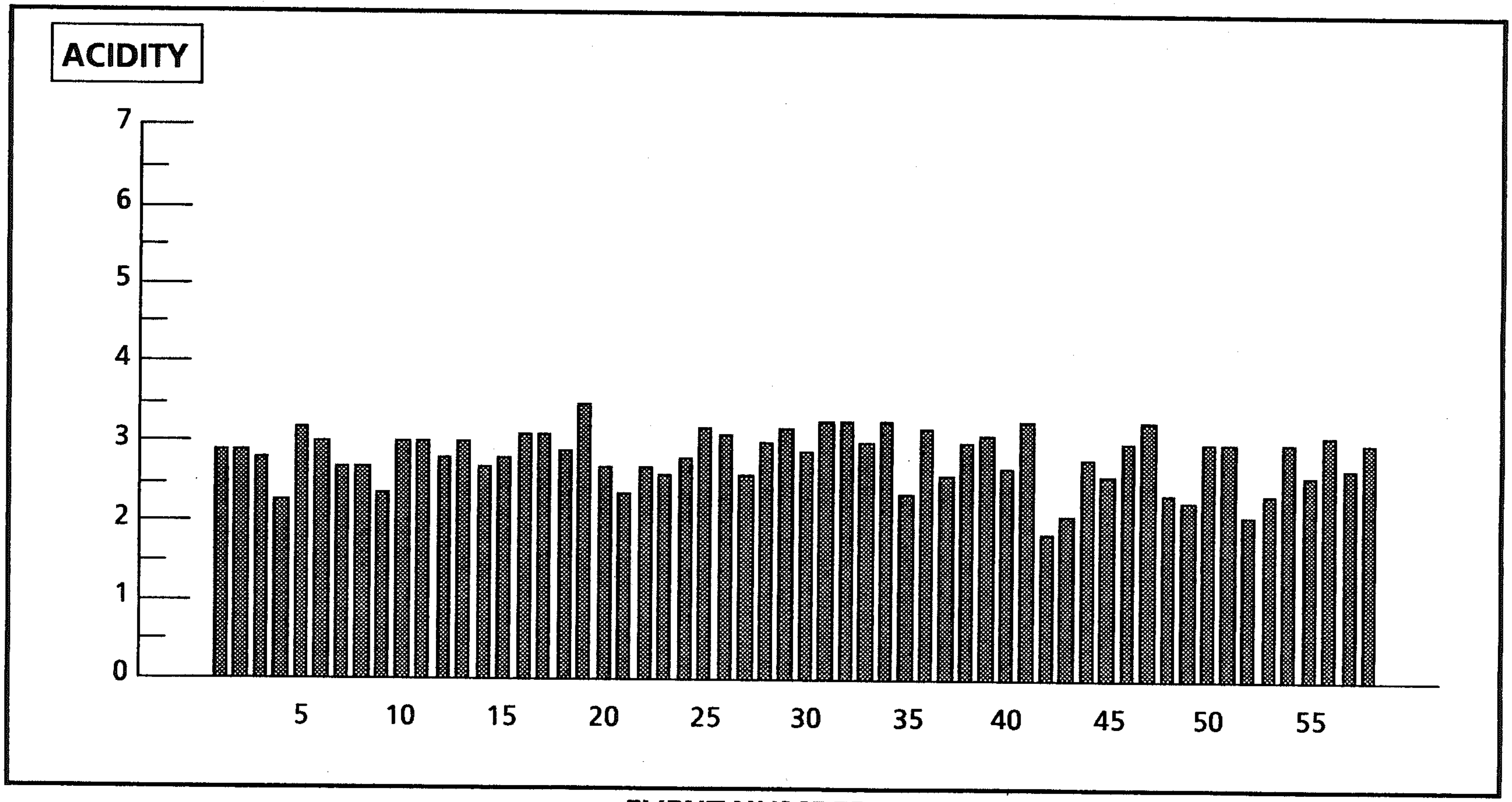


FIGURE 25

ACIDITY OF PRECIPITATION

MARLBOROUGH SITE, 1985

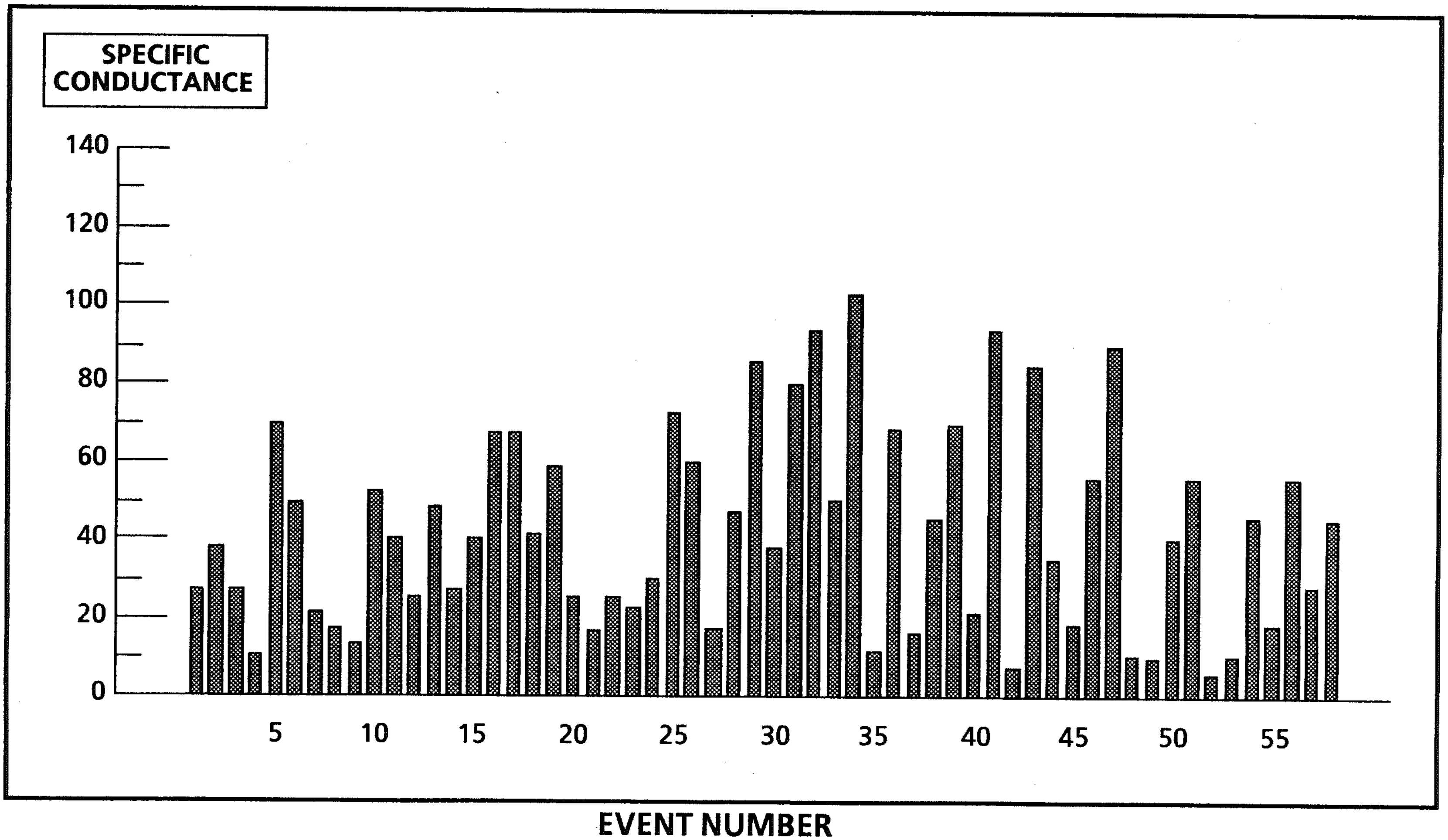


ACIDITY = 7 - pH

FIGURE 26

SPECIFIC CONDUCTANCE OF PRECIPITATION

MARLBOROUGH SITE, 1985



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 1984 and 1985. 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 1985 National Weather Service surface observations and are shown in Figures 28 and 30, respectively. Wind roses from these stations for 1984 are shown in Figures 27 and 29, respectively.

* The mean wind speed for a month or year is calculated for 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

1984 AND 1985 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)		
	1984	1985	Mean[a]	1984	1985	Mean[b]	1984	1985	Normal[c]	1984	1985	Mean[a]	1984	1985	Mean[d]	1984	1985	Mean[d]
Jan	21.8	21.5	26.5	0	0	0	1332	1341	1234	1.80	0.73	3.51	13	11	11	6.0	7.5	9.0
Feb	34.3	29.9	27.8	0	0	0	884	975	1047	4.72	1.72	3.24	14	9	10	7.5	8.4	9.4
Mar	31.4	39.7	37.0	0	0	0	1035	776	874	3.93	2.16	3.74	14	9	12	9.2	9.3	10.0
Apr	48.0	50.7	48.1	0	0	*	503	428	486	4.24	1.54	3.78	12	9	11	7.9	7.7	10.1
May	56.0	60.6	59.1	0	1	1	286	167	197	11.55	2.77	3.62	15	9	12	7.8	7.9	8.9
Jun	69.8	63.7	67.9	6	0	4	32	76	20	2.16	3.55	3.54	10	13	11	7.2	6.7	8.1
Jul	71.8	72.4	73.2	2	1	8	3	0	0	4.22	4.55	3.52	10	11	10	6.7	6.2	7.5
Aug	73.2	70.2	71.0	4	2	5	3	14	8	1.32	6.44	3.81	7	9	10	5.5	5.2	7.1
Sep	59.8	63.4	63.5	0	1	2	186	119	102	1.20	3.83	3.61	7	10	9	6.0	5.5	7.2
Oct	55.2	51.9	53.0	0	0	*	298	401	391	2.76	2.27	3.16	7	9	8	6.2	6.0	7.7
Nov	41.5	43.2	42.0	0	0	0	698	648	702	2.45	6.04	3.77	7	14	11	7.3	7.4	8.4
Dec	35.7	27.5	30.4	0	0	0	896	1157	1113	2.46	1.28	3.74	14	10	12	6.7	7.7	8.6
YEAR	49.9	49.6	50.0	12	5	19	6156	6102	6174	42.85	36.88	43.05	130	123	127	7.0	7.1	8.5

* Less than 0.5
[a] 1905-1985
[b] 1960-1985
[c] 1951-1980
[d] 1955-1985

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

TABLE 32

1984 AND 1985 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)		
	1984	1985	Mean[a]	1984	1985	Mean[b]	1984	1985	Normal[c]	1984	1985	Mean[d]	1984	1985	Mean[e]	1984	1985	Mean[f]
Jan	26.6	26.2	28.3	0	0	0	1188	1197	1101	1.52	1.25	3.59	13	12	11	---	---	13.2
Feb	36.5	32.3	30.5	0	0	0	819	908	963	4.72	1.72	3.30	12	5	10	---	---	13.6
Mar	34.1	41.8	37.9	0	0	0	952	713	831	3.49	1.93	3.96	12	11	11	---	---	13.5
Apr	47.9	50.8	48.0	0	0	0	508	423	492	4.37	0.69	3.89	7	11	11	---	---	13.0
May	57.8	60.9	58.4	0	0	*	227	138	220	8.14	5.11	3.75	14	10	11	---	---	11.6
Jun	71.0	65.6	67.8	5	0	1	18	43	20	3.53	5.34	3.39	10	12	9	---	---	10.5
Jul	73.1	73.6	73.4	2	0	3	0	0	0	6.54	5.19	3.69	11	9	8	---	---	10.0
Aug	74.8	72.8	71.9	2	2	2	0	2	0	1.23	4.62	3.98	8	9	9	---	---	10.1
Sep	63.3	66.6	65.2	0	1	*	104	54	49	2.24	1.60	3.50	7	6	8	---	---	11.2
Oct	57.7	56.0	54.8	0	0	0	219	278	285	2.79	1.48	3.34	8	7	7	---	---	11.9
Nov	45.0	46.6	44.2	0	0	0	593	541	585	1.83	5.67	3.78	10	14	10	---	---	12.7
Dec	40.2	31.4	33.2	0	0	0	761	1032	955	2.56	1.25	3.68	13	13	11	---	---	13.0
YEAR	52.3	52.1	51.1	9	3	6	5389	5329	5501	42.96	35.85	43.84	125	119	117	---	---	12.0

* Less than 0.5
[a] 1903-1985
[b] 1960-1985
[c] 1951-1980
[d] 1955-1985
[e] 1949-1985
[f] ~~1963-1985~~ 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 1984
BRADLEY INTERNATIONAL AIRPORT
WINDSOR LOCKS, CONNECTICUT

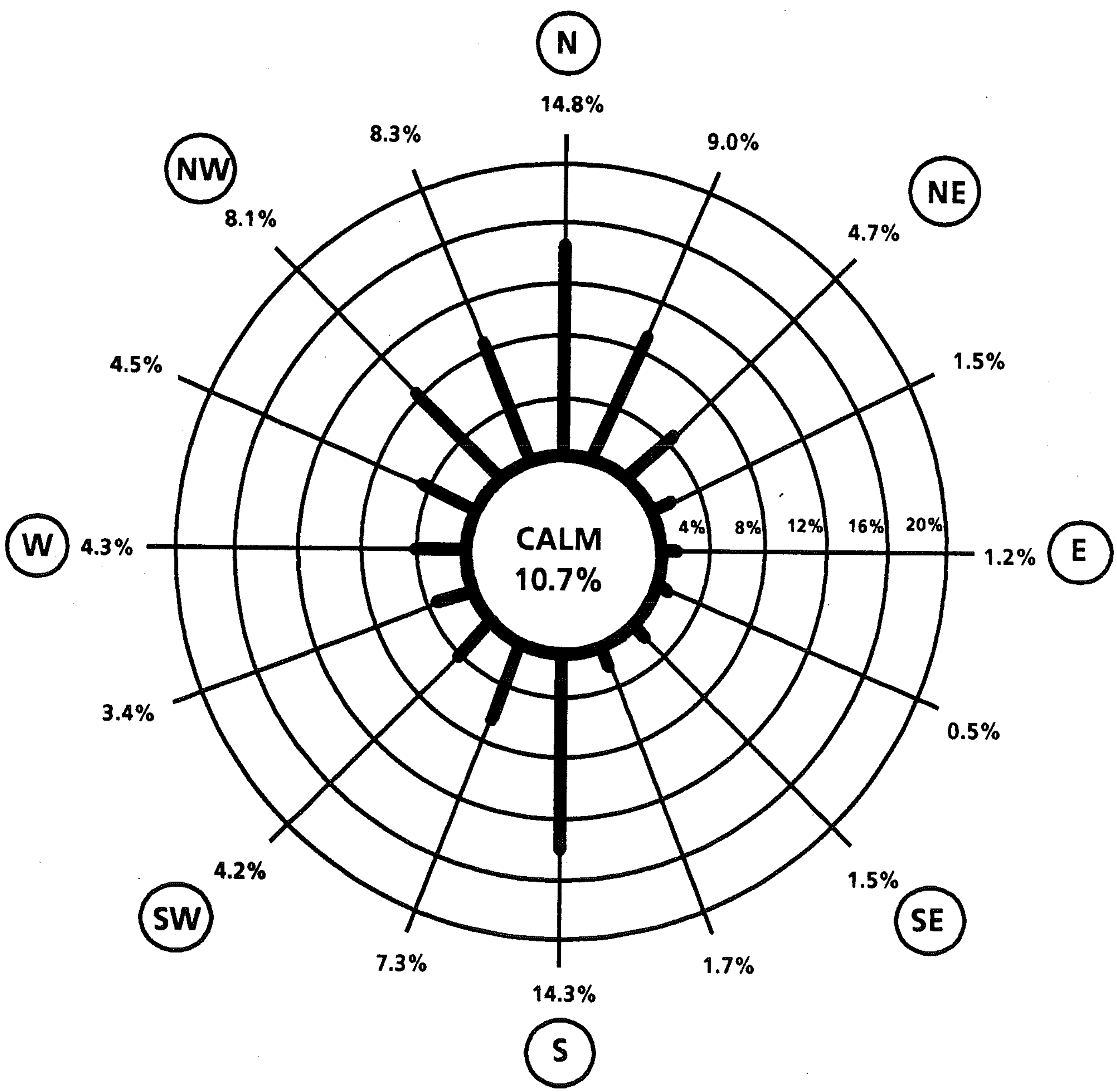


FIGURE 28

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

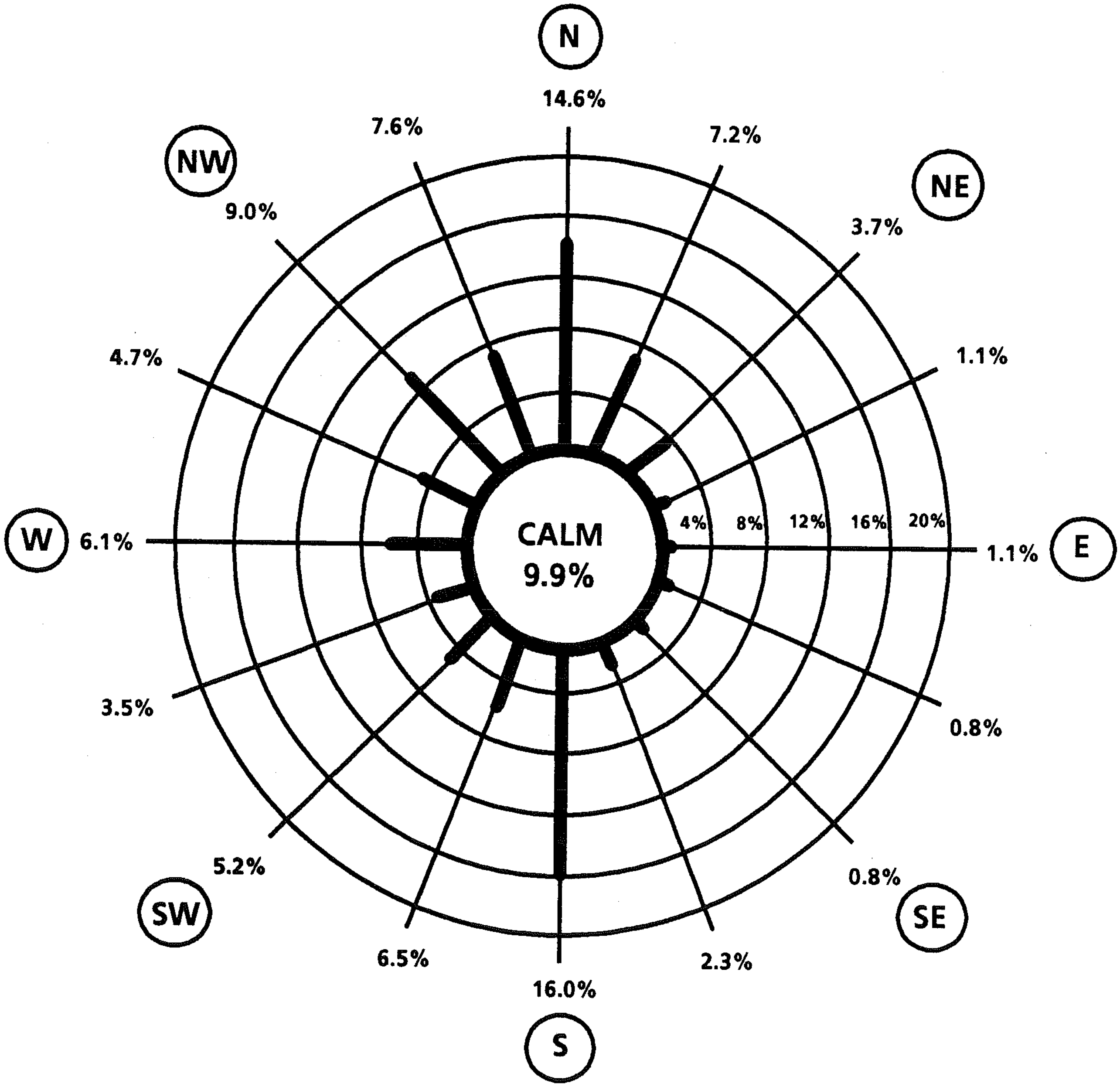


FIGURE 29

ANNUAL WIND ROSE FOR 1984
NEWARK INTERNATIONAL AIRPORT
NEWARK, NEW JERSEY

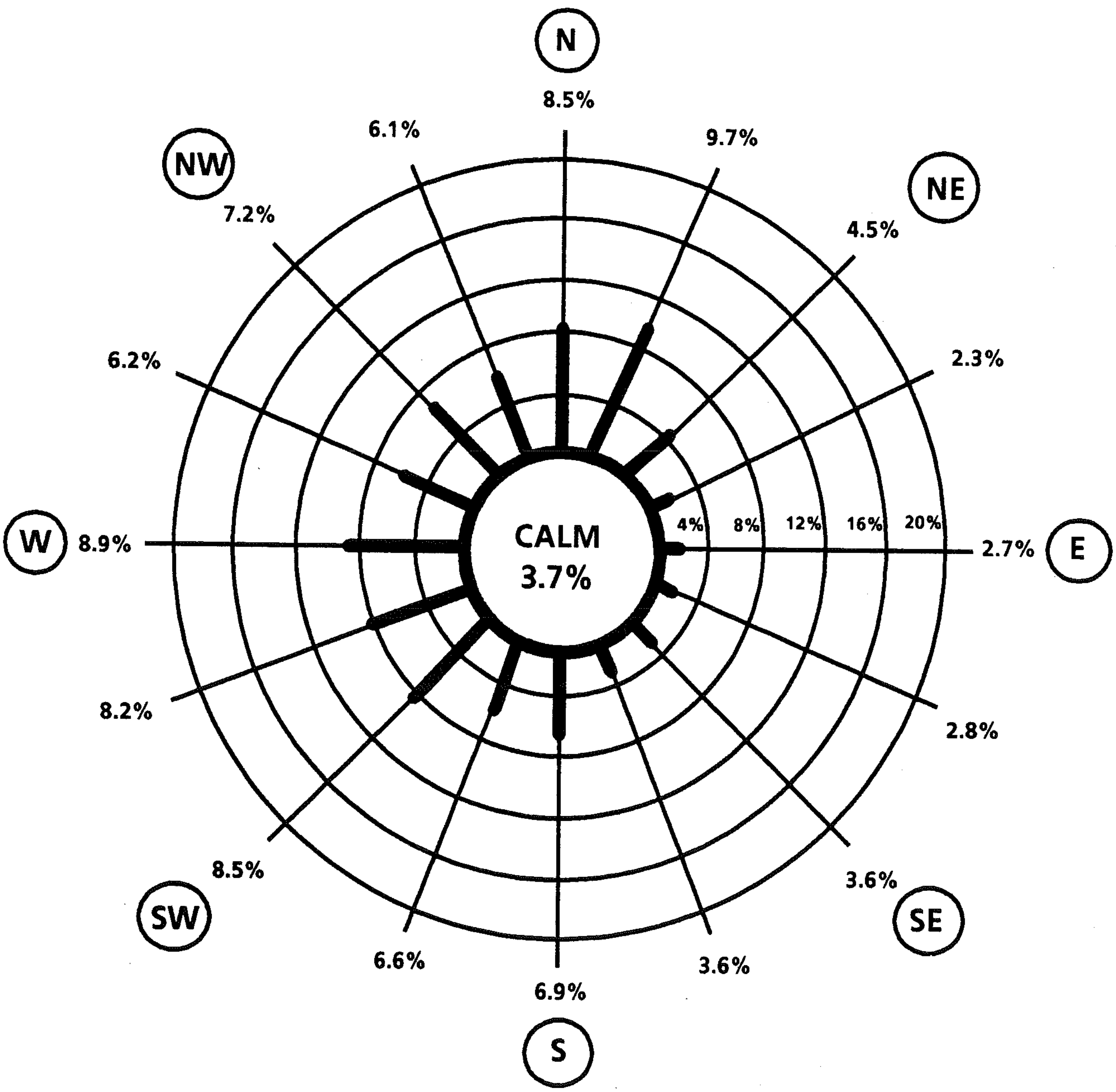
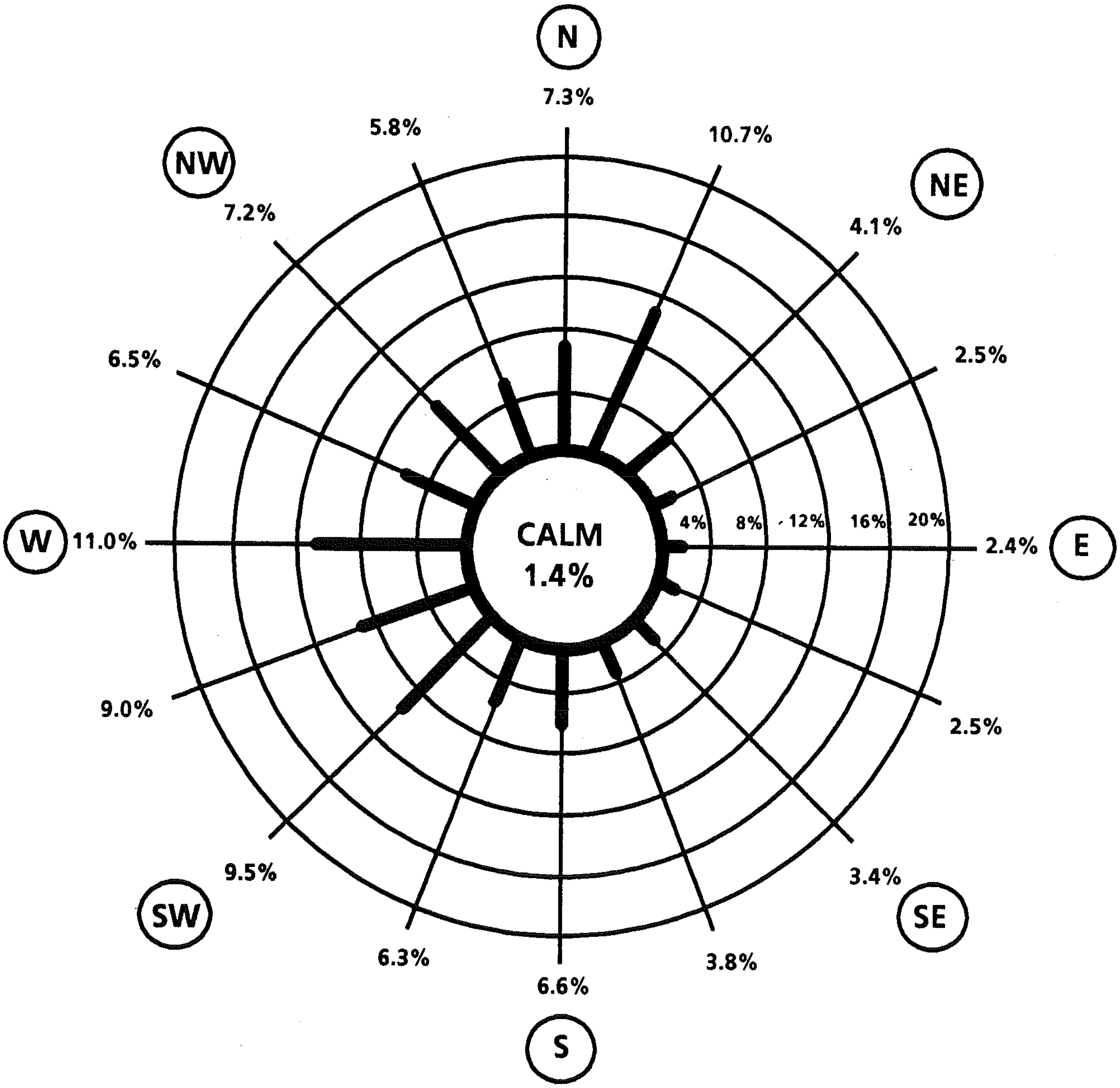


FIGURE 30

ANNUAL WIND ROSE FOR 1985
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 1985 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.

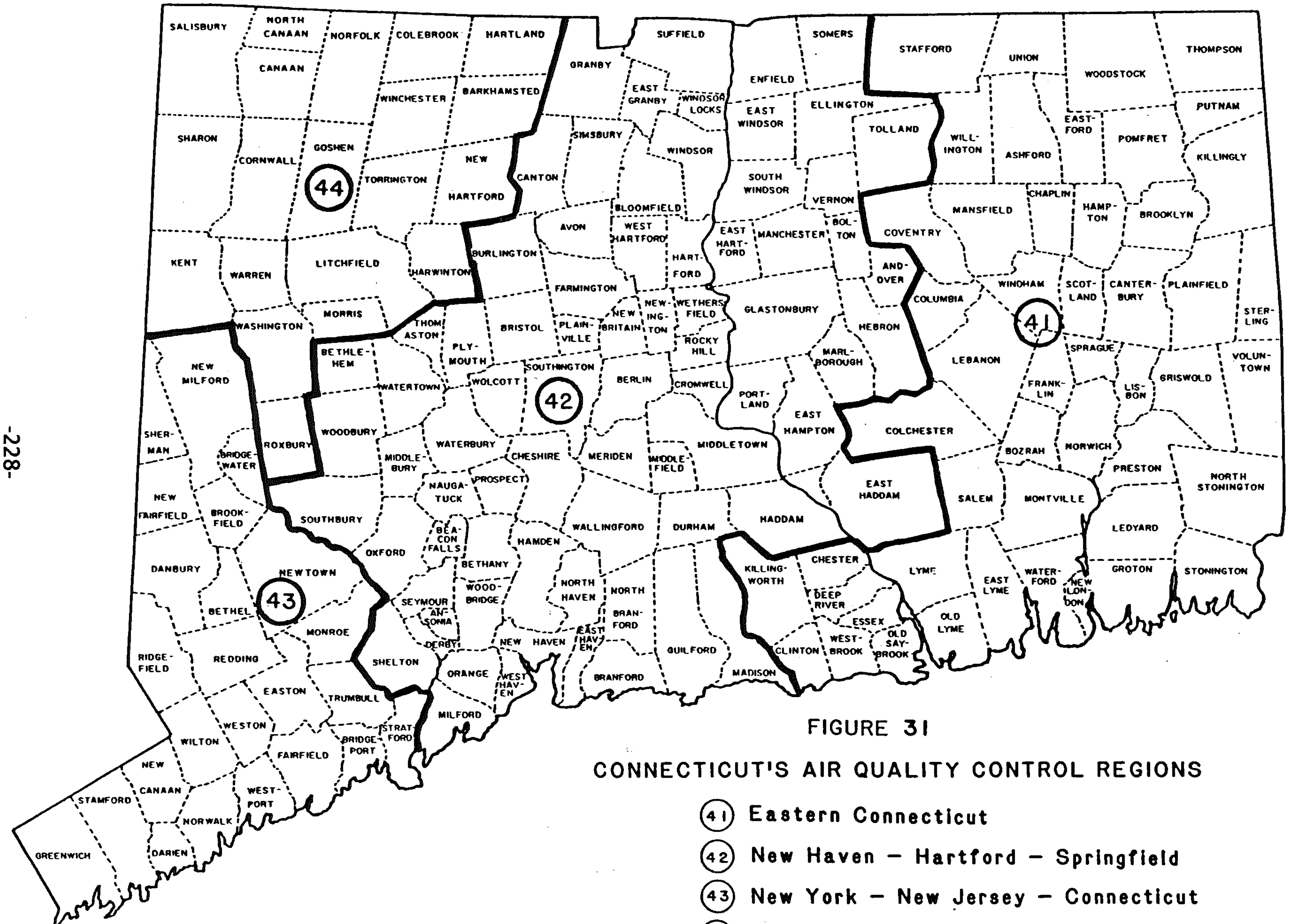


FIGURE 31

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 1985

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 1985, Connecticut maintained three co-located TSP monitors (Bridgeport 009, Hartford 003, and Waterbury 005) and one co-located lead sampler (Waterbury 123), and performed duplicate strip analyses at four sites (Hartford 016, New Haven 018, New Haven 123, 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) only continuous instruments are used to monitor gaseous pollutants; 2) the regulations specify a minimum number and locations for them; and 3) the data, in addition to being included in the annual report, are 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 1985 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 each pollutant and monitoring objective. The 1985 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 1985

Pollutant	Monitoring Methods		
	Reference Manual	Reference Automated	Equivalent Automated
TSP	High Volume Method		
SO_2			Thermo Electron 43 (0.5)
O_3		Bendix 8002 (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

1985 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling & Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale and 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
Preston	New London/ Norwich	002	S	Pulsed Fluorescence	Continuous	Background	Regional
Stamford	Stamford	025	S	Pulsed Fluorescence	Continuous	Population	Neighborhood
Stamford	Stamford	123	S	Pulsed Fluorescence	Continuous	High Concentration	Neighborhood
Waterbury	Waterbury	123	S	Pulsed Fluorescence	Continuous	Population	Neighborhood

TABLE 35, CONTINUED

1985 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling & Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale and 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	007	S	NDIR	Continuous	High Concentration	Micro
Stamford	Stamford	020	S	NDIR	Continuous	High Concentration	Micro

TABLE 35, CONTINUED

1985 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale and 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

1985 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale and 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

1985 SLAMS AND NAMS SITES IN CONNECTICUT

Town	Urban Area	Site	SLAMS or NAMS	Sampling Method	Analytic Method	Operating Schedule	Monitoring Objective	Spatial Scale and 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	016	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Micro
New Haven	New Haven	018	S	Lo-Vol	Atomic Abs.	1 month	High Concentration	Middle
New Haven	New Haven	123	S	Hi-Vol	Atomic Abs.	6th day	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 1985, 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.

Together the computerized point source inventory and the more indirectly arrived at, but much larger, area source inventory 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 1985. 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

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY

County	Sources	TSP	SO_2	CO	VOC	NO_x[1]
		TONS PER YEAR OF EMISSIONS				
Fairfield	Area	8,068.7	4,507.6	129,306.1	31,700.2	27,299.1
	Point	2,129.1	28,863.2	3,934.7	3,987.3	13,292.7
	All	10,197.8	33,370.8	133,240.8	35,687.5	40,591.8
Hartford	Area	8,912.2	4,605.5	134,872.4	32,848.0	28,120.2
	Point	800.0	3,582.8	532.7	3,942.9	2,887.7
	All	9,712.2	8,188.3	135,405.1	36,790.9	31,007.9
Litchfield	Area	2,553.5	914.0	29,603.4	8,685.6	5,414.7
	Point	180.3	682.5	67.3	942.7	299.0
	All	2,733.8	1596.5	29,670.7	9628.3	5,713.7
Middlesex	Area	2,296.1	915.9	28,535.1	7,768.7	5,604.9
	Point	880.1	7,393.5	532.9	728.1	5,707.5
	All	3,176.2	8,309.4	29,068.0	8,496.8	11,312.4
New Haven	Area	7,874.2	4,174.2	106,698.2	28,096.6	23,640.6
	Point	1,169.5	24,571.9	921.0	5,117.4	7,871.5
	All	9,043.7	28,746.1	107,619.2	33,214.0	31,512.1
New London	Area	3,849.4	1,589.8	50,208.3	13,575.8	9,859.2
	Point	1,066.3	13,577.2	477.9	2,002.2	4,172.7
	All	4,915.7	15,167.0	50,686.2	15,578.0	14,031.9
Tolland	Area	2,104.9	709.6	26,028.9	7,111.2	5,280.2
	Point	108.8	935.2	48.5	111.5	321.4
	All	2,213.7	1,644.8	26,077.4	7,222.7	5,601.6
Windham	Area	1,897.8	562.9	20,916.5	5,945.4	3,734.1
	Point	238.5	549.9	840.4	637.9	320.7
	All	2,136.3	1,112.8	21,756.9	6,583.3	4,054.8
TOTAL	Area	37,556.9	17,979.5	526,168.8	135,731.5	108,953.0
	Point	6,572.6	80,156.1	7,355.5	17,470.0	34,873.2
	All	44,129.5	98,135.6	533,524.3	153,201.5	143,826.2

[1] NO_x emissions are expressed as NO_2

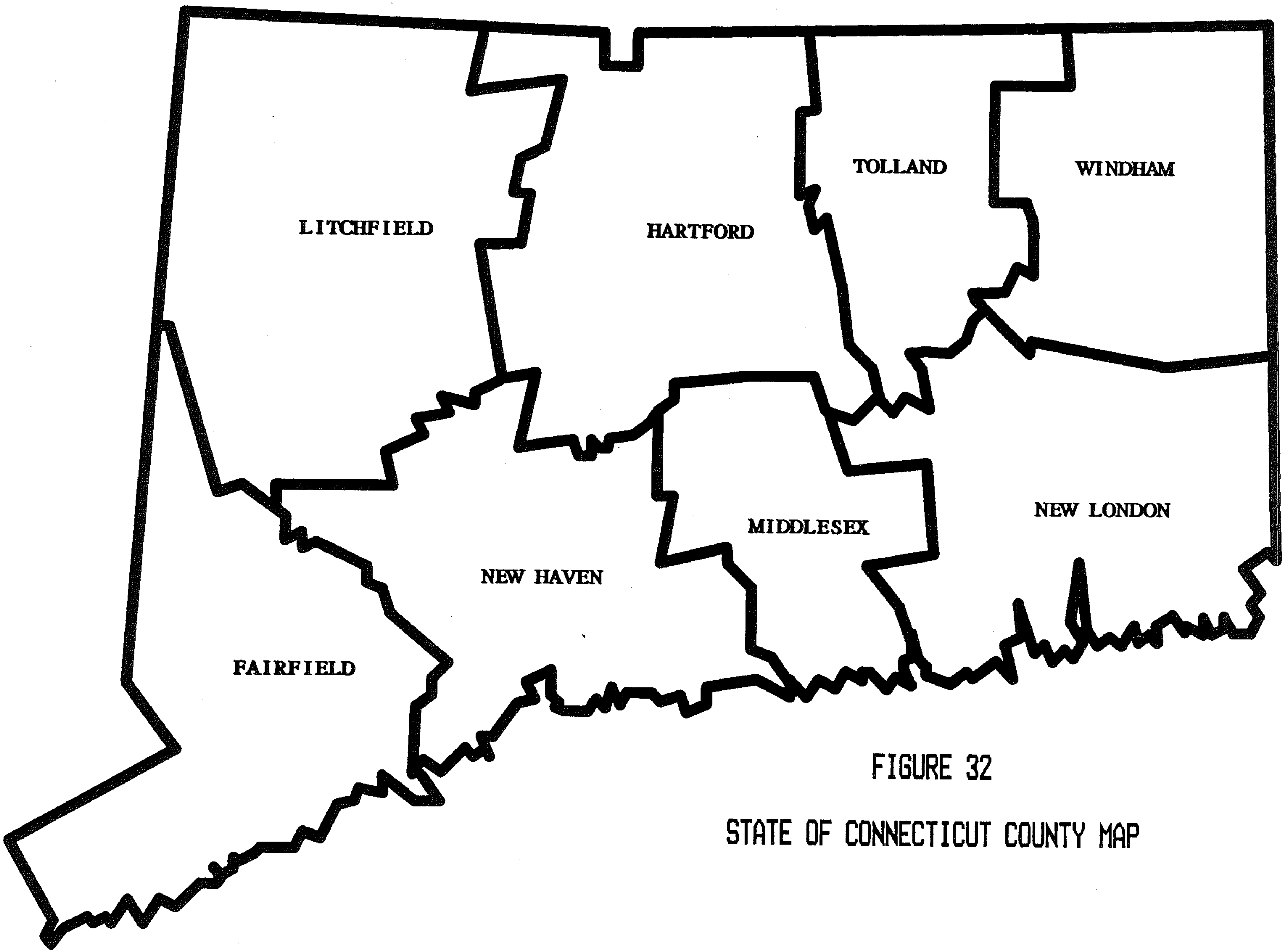


FIGURE 32

STATE OF CONNECTICUT COUNTY MAP

FIGURE 33

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY
TOTAL SUSPENDED PARTICULATES

(TOTAL TONS PER YEAR : 44,130)

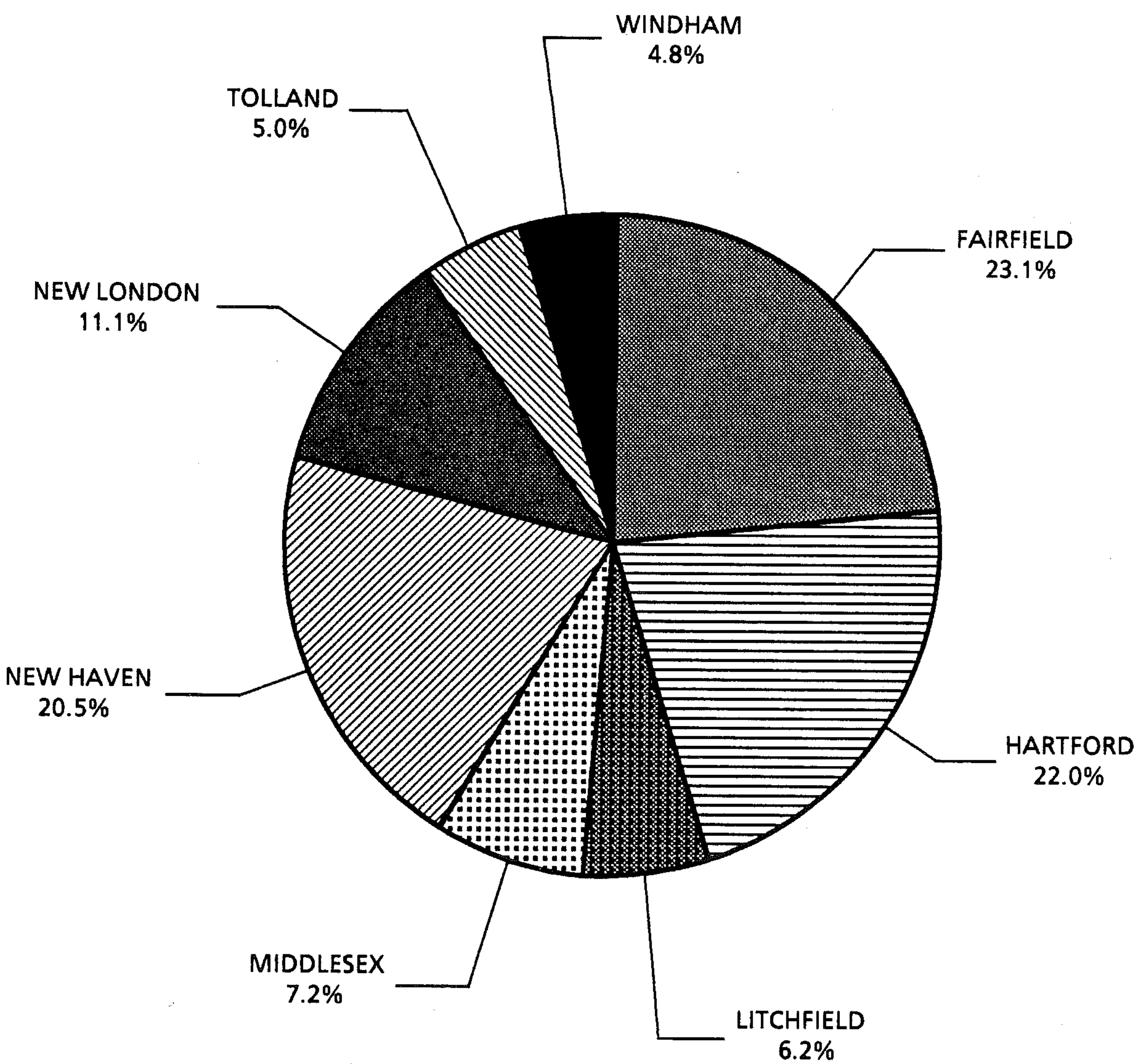


FIGURE 34

1985 TOTAL SUSPENDED PARTICULATES

Total Emissions by County

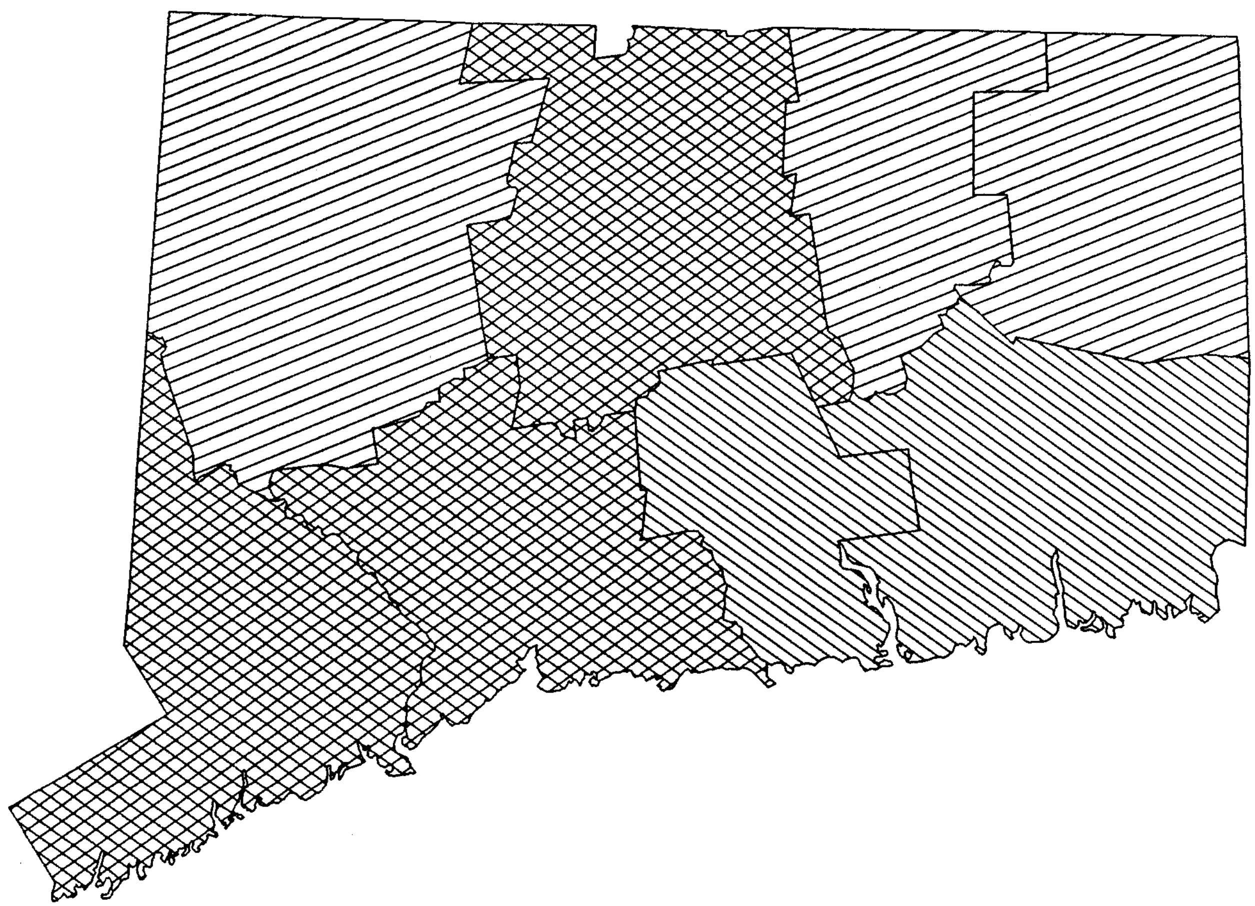
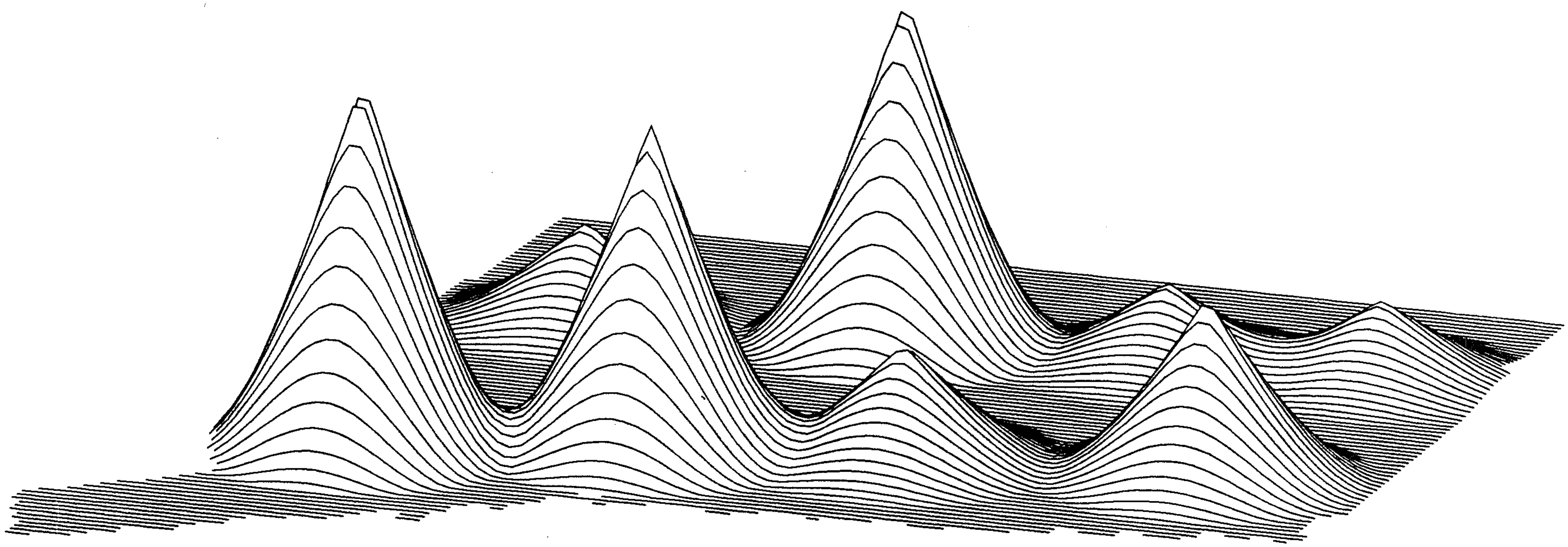


FIGURE 35

1985 TOTAL SUSPENDED PARTICULATES

Total Emissions by County



Three Dimensional View of TSP Emissions

FIGURE 36

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY
SULFUR DIOXIDE

(TOTAL TONS PER YEAR : 98,136)

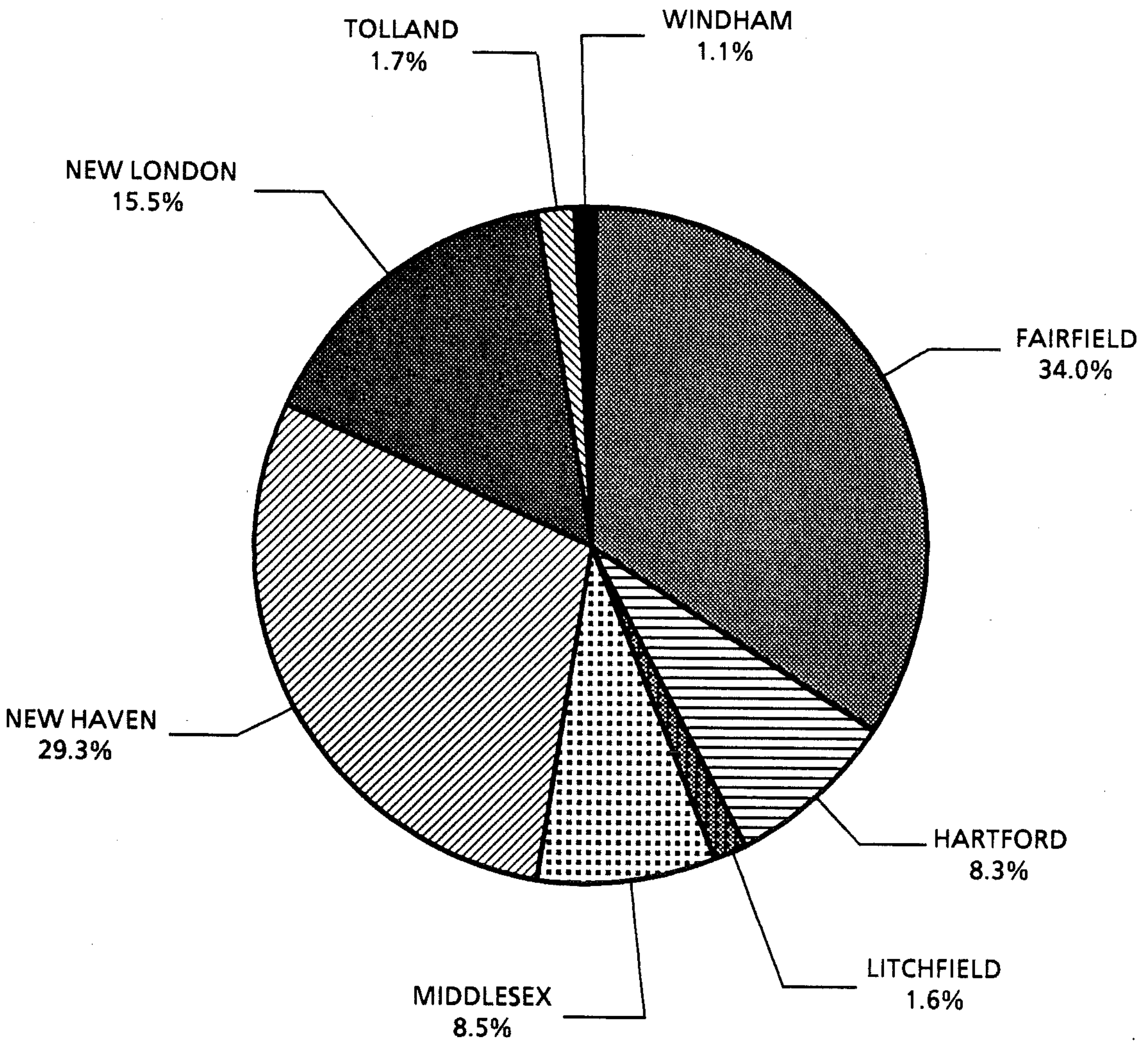


FIGURE 37

1985 SULFUR DIOXIDE

Total Emissions by County

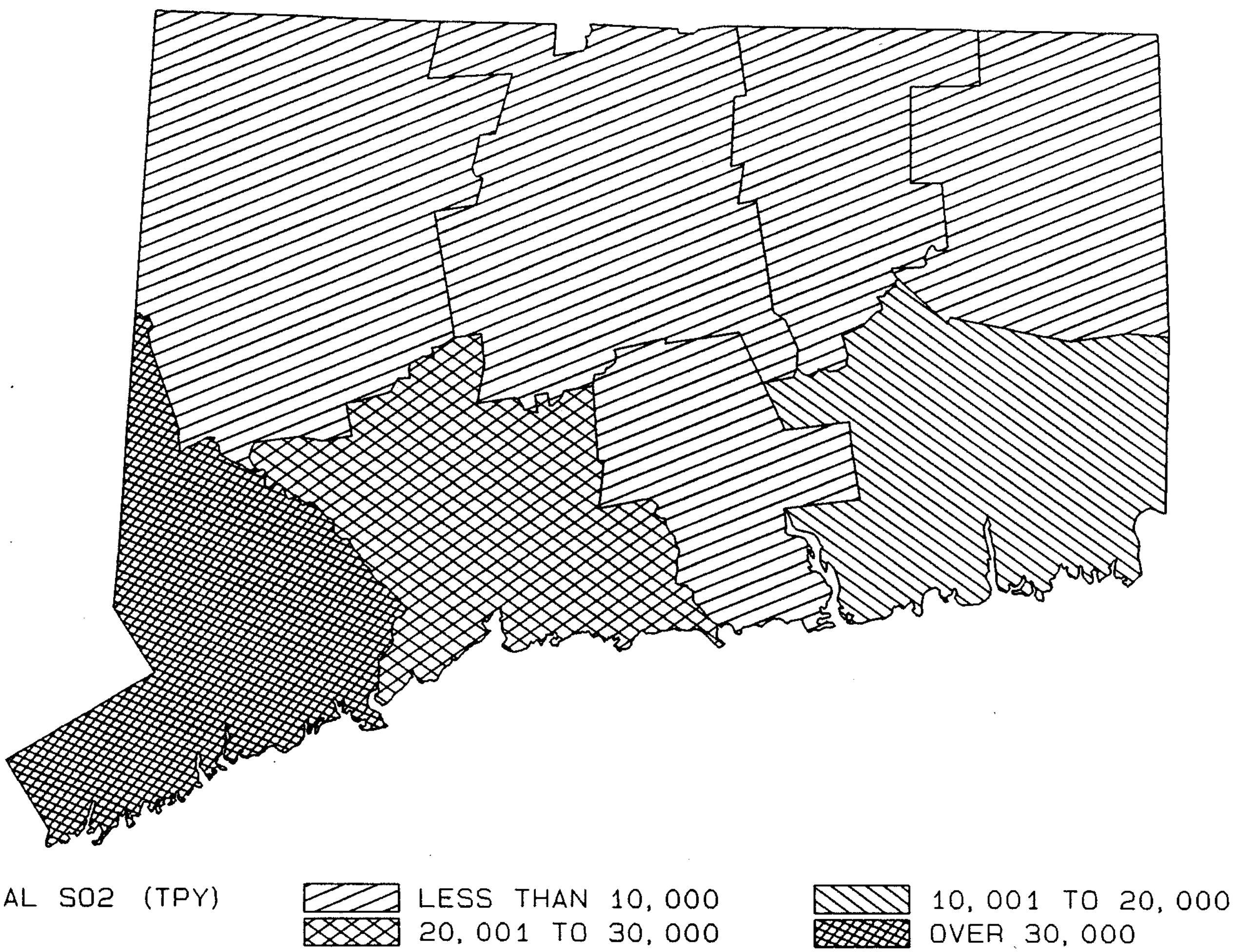
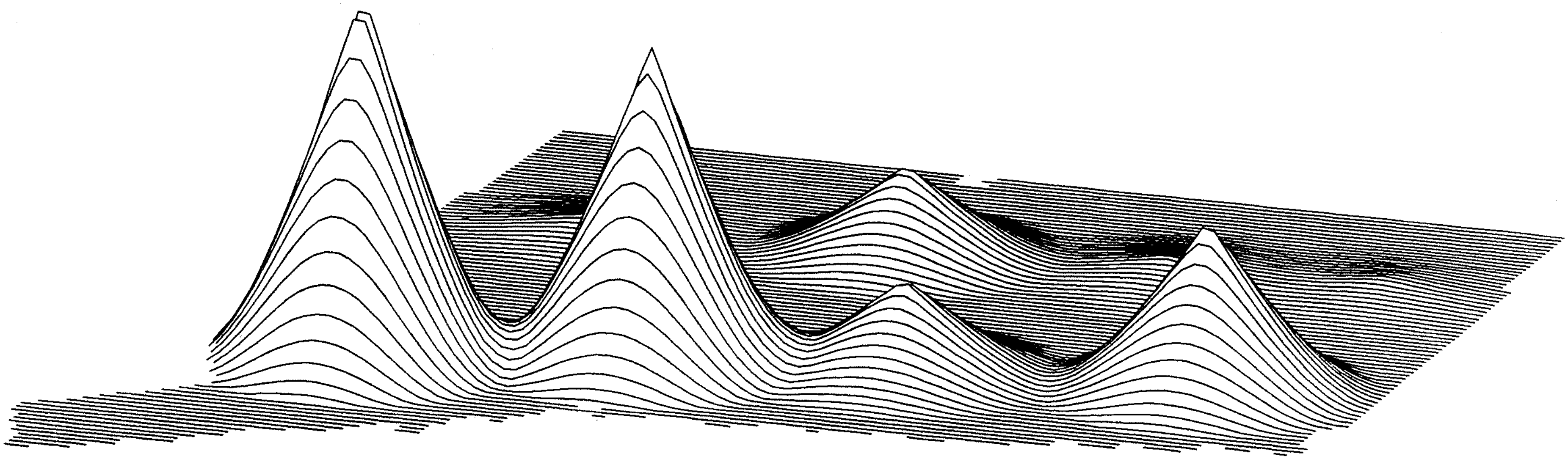


FIGURE 38

1985 SULFUR DIOXIDE

Total Emissions by County



Three Dimensional View of SO2 Emissions

FIGURE 39

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY
CARBON MONOXIDE

(TOTAL TONS PER YEAR : 533,524)

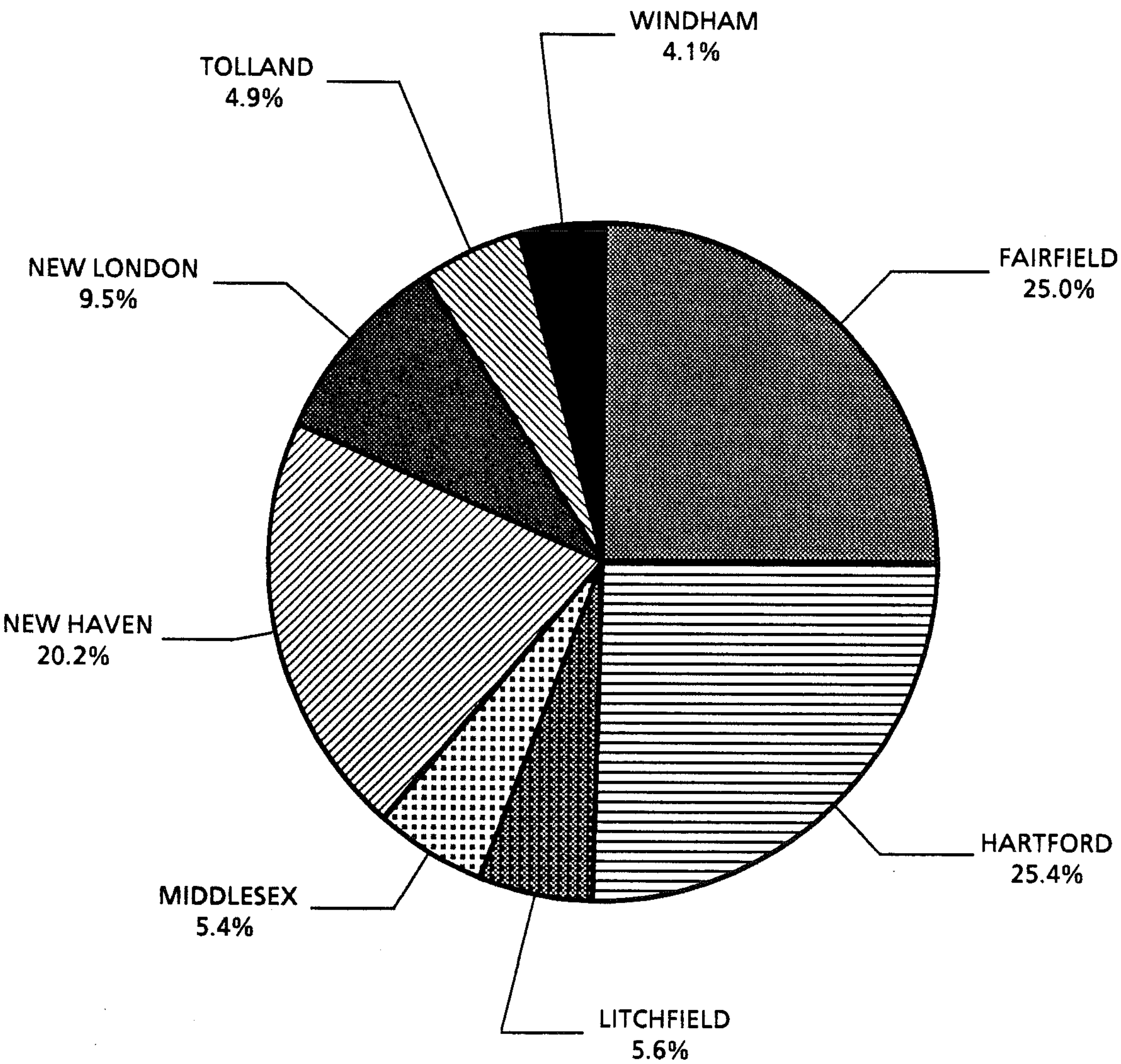


FIGURE 40

1985 CARBON MONOXIDE

Total Emissions by County

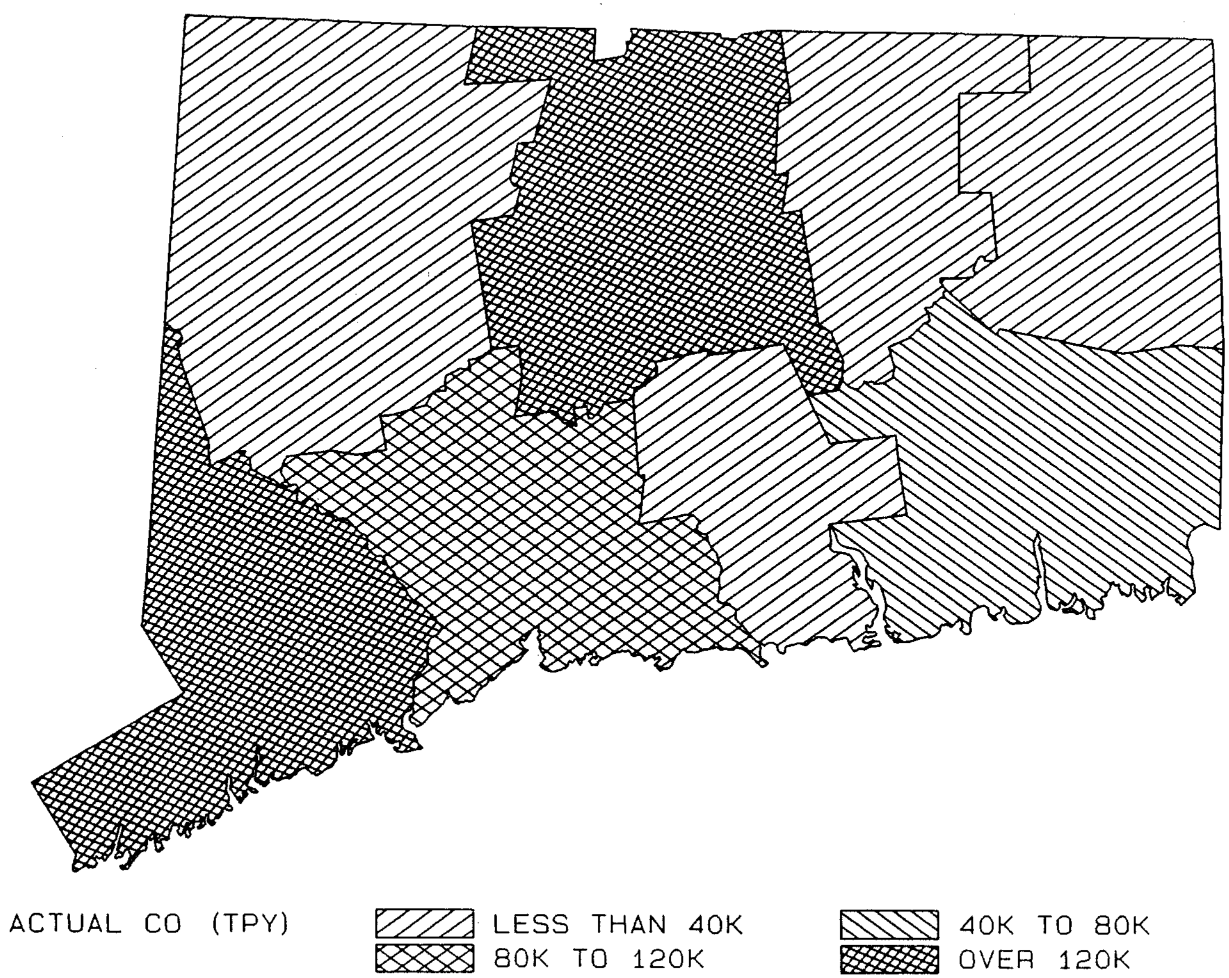
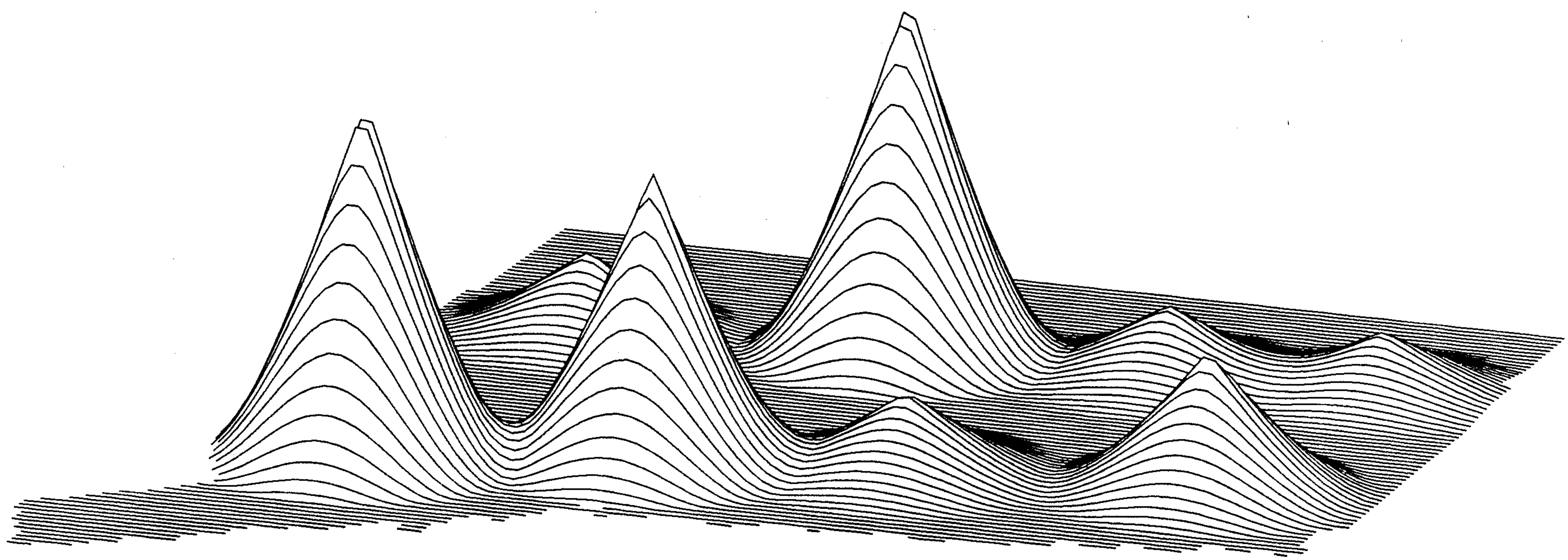


FIGURE 41

1985 CARBON MONOXIDE

Total Emissions by County



Three Dimensional View of CO Emissions

FIGURE 42

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY VOLATILE ORGANIC COMPOUNDS

(TOTAL TONS PER YEAR : 153,202)

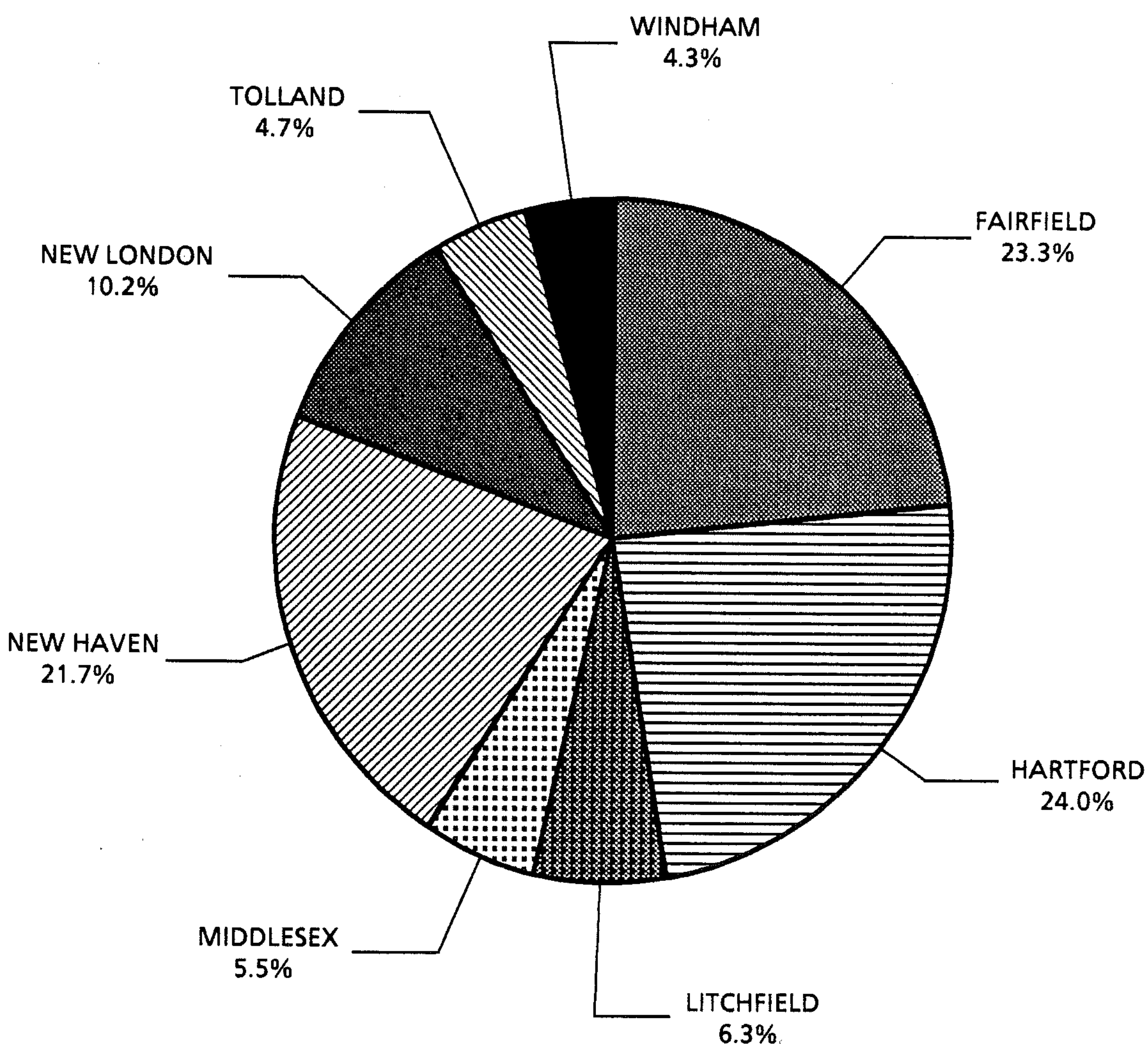


FIGURE 43

1985 VOLATILE ORGANIC COMPOUNDS

Total Emissions by County

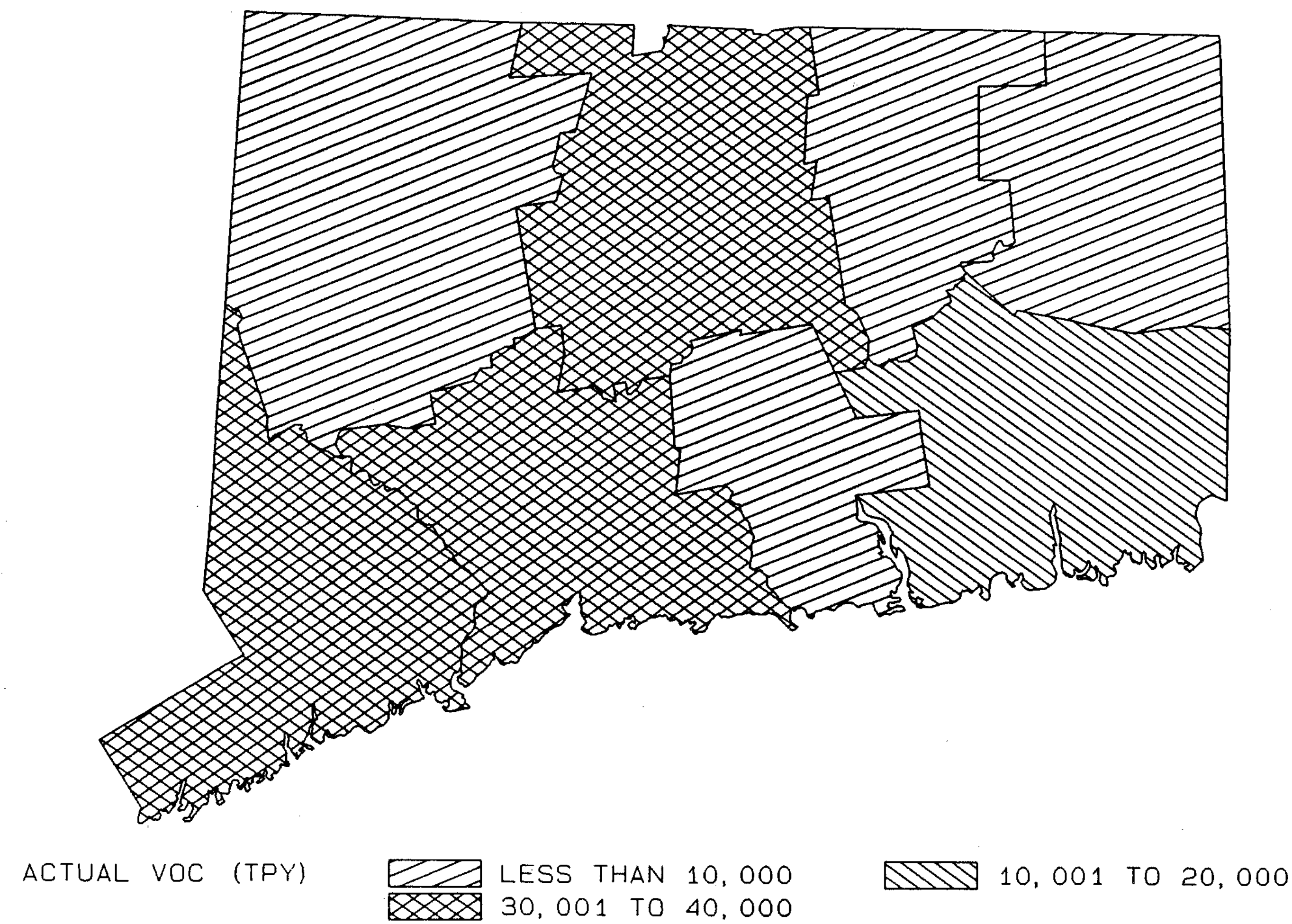
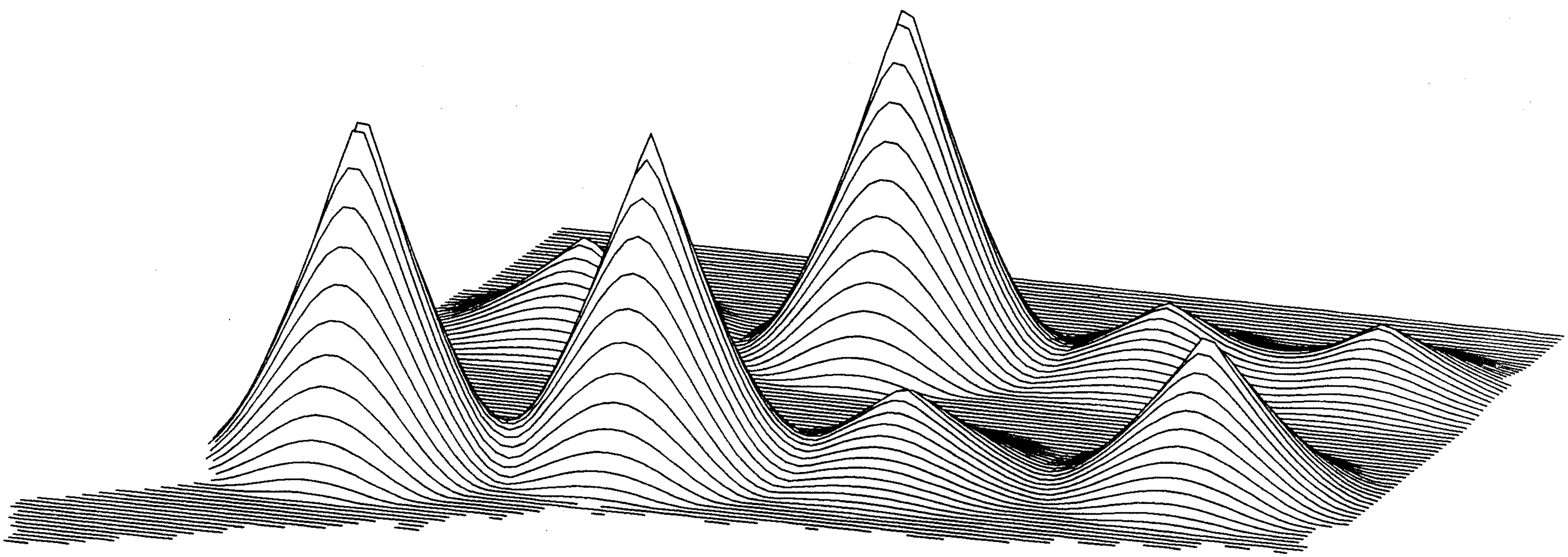


FIGURE 44

1985 VOLATILE ORGANIC COMPOUNDS

Total Emissions by County



Three Dimensional View of VOC Emissions

FIGURE 45

1985 CONNECTICUT EMISSIONS INVENTORY BY COUNTY NITROGEN OXIDES

(Expressed as Nitrogen Dioxide)

(TOTAL TONS PER YEAR : 143,826)

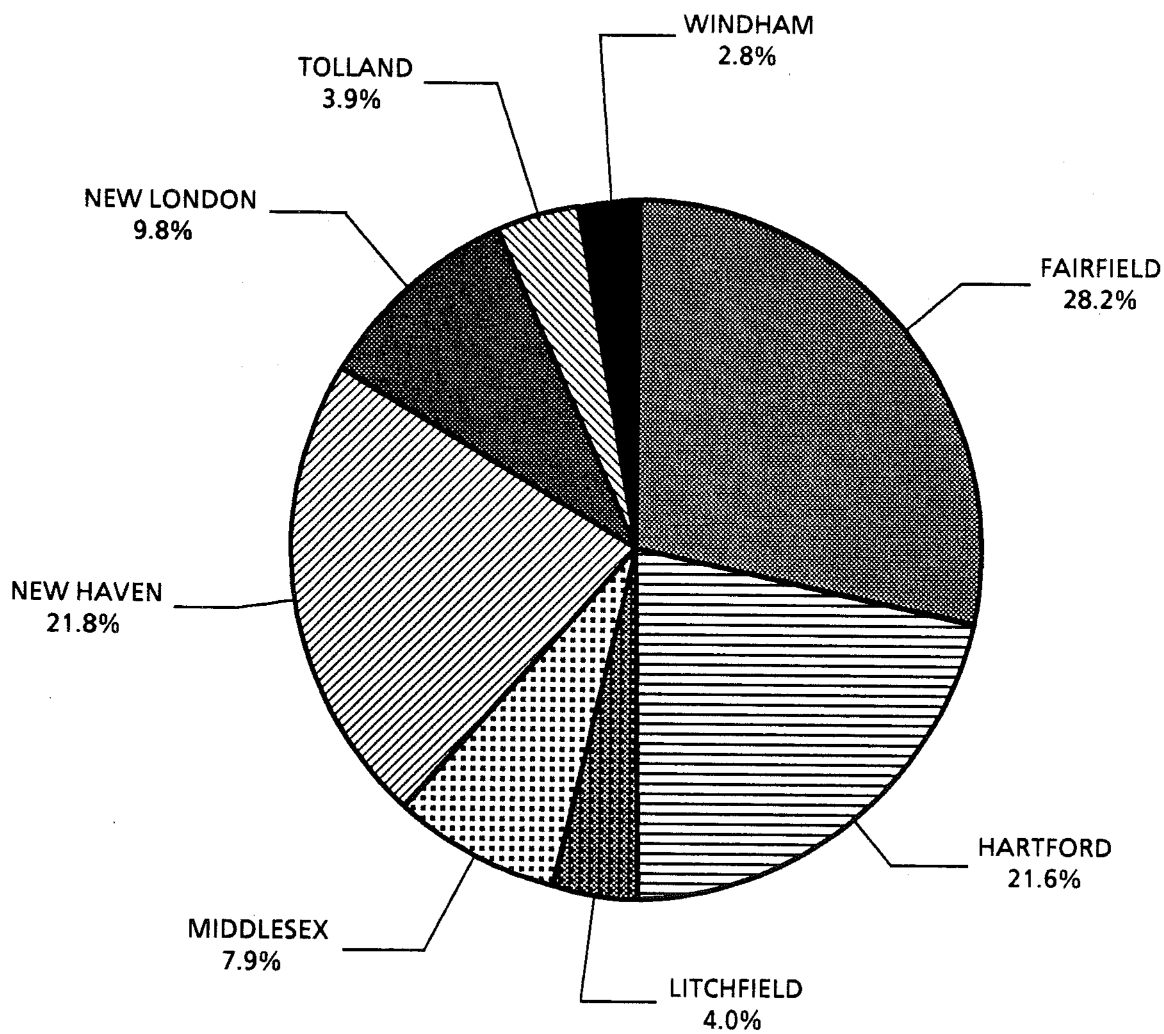


FIGURE 46

1985 NITROGEN OXIDES

(Expressed as Nitrogen Dioxide)

Total Emissions by County

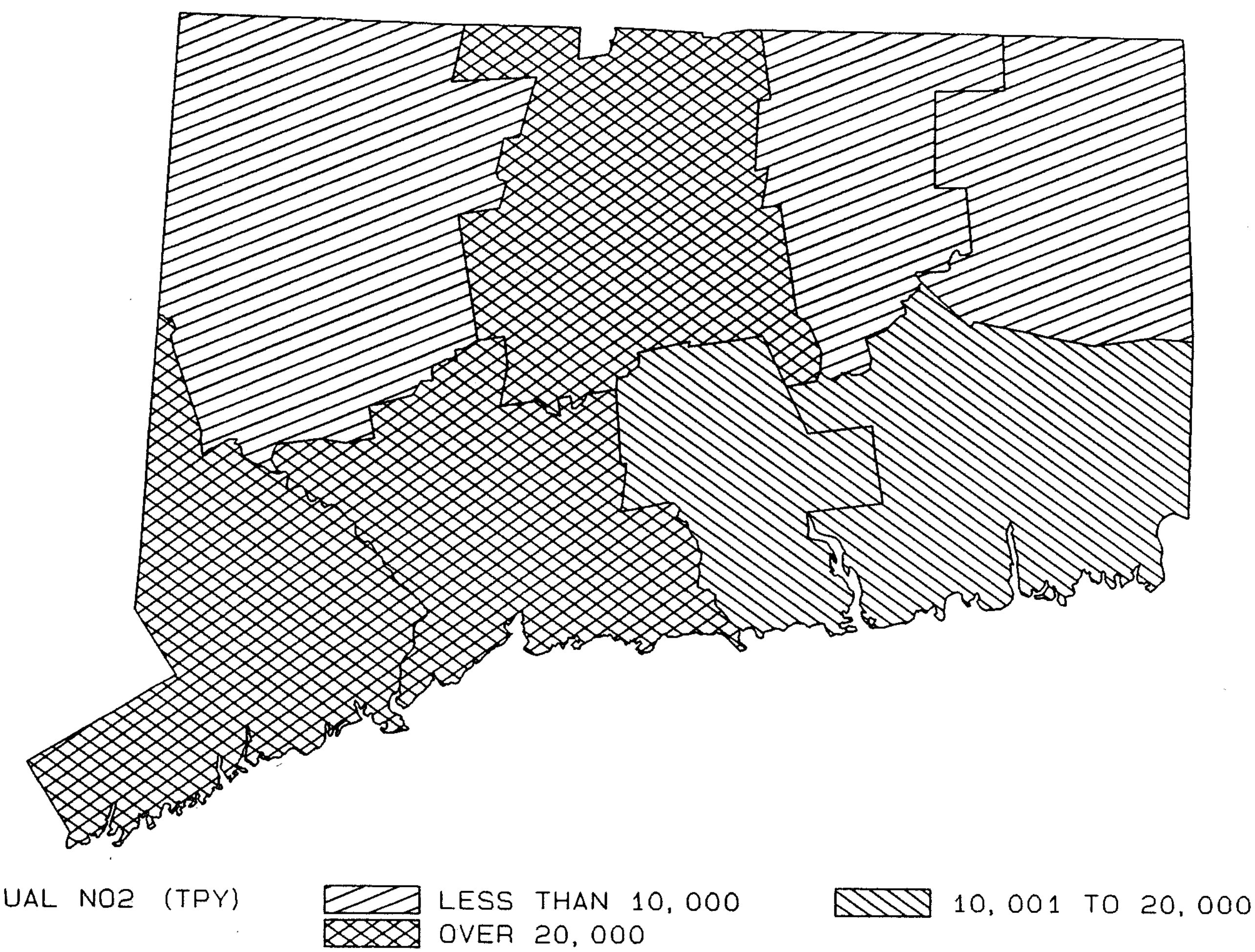
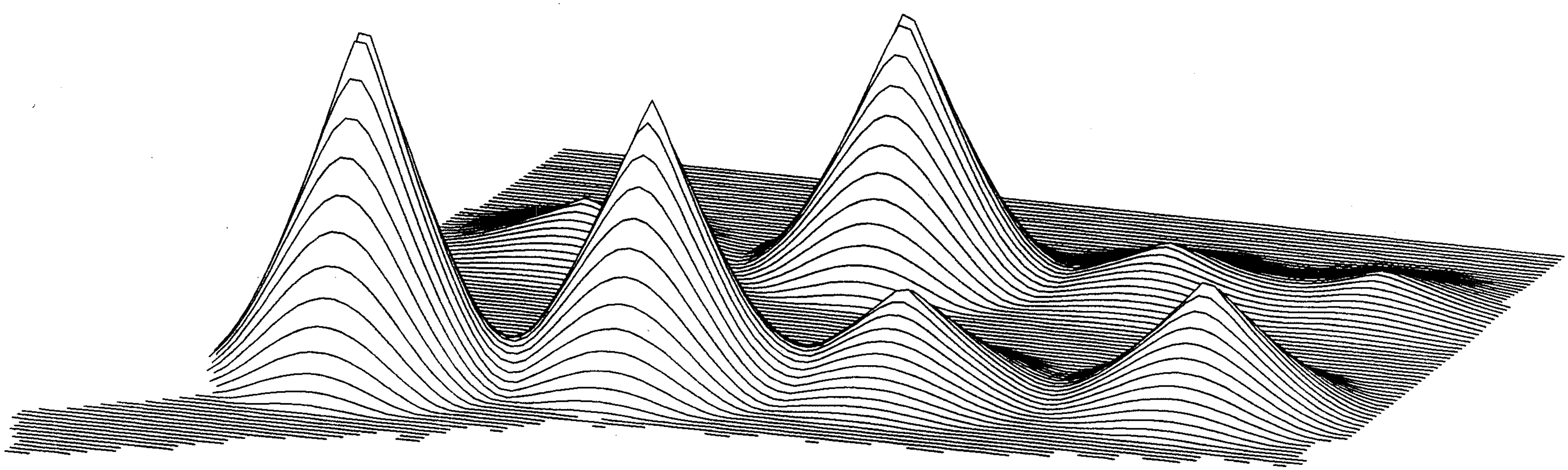


FIGURE 47

1985 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.

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.

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.

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).

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).

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.

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.

Lepow, M.L., L. Bruckman, M. Gillette, R.A. Rubino and J.Kapish, ***"Investigations into Sources of Lead in the Environment of Urban Children, "*** Environ. Res., 10: 415-26 (1975).

Bruckman, L., E. Hyne and P. Norton, ***"A Low Volume Particulate Ambient Air Sampler,"*** paper presented at the APCA Specialty Conference entitled "Measurement Accuracy as it Relates to Regulation Compliance," New Orleans, Louisiana, October 26-28, 1975, APCA publication SP-16, Air Pollution Control Association, Pittsburgh, Pennsylvania, 1976.

Bruckman, L. and R.A. Rubino, ***"High Volume Sampling Errors Incurred During Passive Sample Exposure Periods,"*** J. Air Pollut. Cntr. Assoc., 26: 881-3 (1976).

Bruckman, L., R.A. Rubino and B. Christine, ***"Asbestos and Mesothelioma Incidence in Connecticut,"*** J. Air Pollut. Cntr. Assoc., 27: 121-6 (1977).

Bruckman, L., ***Suspended Particulate Transport in Connecticut: An Investigation Into the Relationship Between TSP Concentrations and Wind Direction in Connecticut***, internal report issued by the Connecticut Department of Environmental Protection, Hartford, Connecticut, December 24, 1976.

Bruckman, L. and R.A. Rubino, ***"Monitored Asbestos Concentrations in Connecticut,"*** paper presented at the 70th Annual Meeting of the Air Pollution Control Association, Toronto, Ontario, June 20-24, 1977.

Bruckman, L., ***"Suspended Particulate Transport,"*** paper presented at the 70th Annual Meeting of the Air Pollution Control Association, Toronto, Ontario, June 20-24, 1977.

Bruckman, L., ***"A Study of Airborne Asbestos Fibers in Connecticut,"*** paper presented at the "Workshop in Asbestos: Definitions and Measurement Methods" sponsored by the National Bureau of Standards/U.S. Department of Commerce, July 18-20, 1977.

Bruckman, L., ***"Monitored Asbestos Concentrations Indoors,"*** paper presented at The Fourth Joint Conference of Sensing Environmental Pollutants, New Orleans, Louisiana, November 6-11, 1977.

Bruckman, L., paper presented at the Joint Conference on Applications of Air Pollution Meteorology, Salt Lake City, Utah, November 28 - December 2, 1977.

Bruckman, L., E. Hyne, W. Keever, ***"A Comparison of Low Volume and High Volume Particulate Sampling,"*** internal report issued by the Connecticut Department of Environmental Protection, Hartford, Connecticut, 1976.

"Data Validation and Monitoring Site Review," (part of the Air Quality Maintenance Planning Process), internal report issued by the Connecticut Department of Environmental Protection, Hartford, Connecticut, June 15, 1976.

"Air Quality Data Analysis," (part of the Air Quality Maintenance Planning Process), internal report issued by the Connecticut Department of Environmental Protection, Hartford, Connecticut, August 16, 1976.

Bruckman, L., ***"Investigation into the Causes of Elevated SO2 Concentrations Prevalent Across Connecticut During Periods of SW Wind Flow,"*** paper presented at the 71st Annual Meeting of the Air Pollution Control Association, Paper #78-16.4, Houston, Texas, June 25-29, 1978.

Anderson, M.K., ***"Power Plant Impact on Ambient Air: Coal vs. Oil Combustion,"*** paper presented at the 68th Annual Meeting of the Air Pollution Control Association, Paper #75-33.5, Boston, MA, June 15-20, 1975.

Anderson, M.K., G. D. Wight, ***"New Source Review: An Ambient Assessment Technique,"*** paper presented at the 71st Annual Meeting of the Air Pollution Control Association, Paper #78-2.4, Houston, TX, June 25-29, 1978.

Wolff, G.T., P.J. Lioy, G.D. Wight, R.E. Pasceri, ***"Aerial Investigation of the Ozone Plume Phenomenon,"*** J. Air Pollut.8 Control Association, 27: 460-3 (1977).

Wolff, G.T., P.J. Lioy, R.E. Meyers, R.T. Cederalll, G.D. Wight, R.E. Pasceri, R.S. Taylor, ***"Anatomy of Two Ozone Transport Episodes in the Washington, D.C., to Boston, Mass., Corridor,"*** Environ. Sci. Technol., 11-506-10 (1977).

Wolff, G.T., P.J. Lioy, G.D. Wight, R.E. Meyers, and R.T Cederwall, ***"Transport of Ozone Associated With an Air Mass,"*** In: Proceed. 70 Annual Meeting APCA, Paper 377-20.3, Toronto, Canada, June, 1977.

Wight, G.D., G.T. Wolff, P.J. Lioy, R.E. Meyers, and R.T.Cederwall, ***"Formation and Transport of Ozone in the Northeast Quadrant of the U.S.,"*** In: Proceed. ASTM Sym. Air Quality and Atmos. Ozone, Boulder, Colo., Aug. 1977.

Wolff, G.T., P.J. Lioy, and G.D. Wight, ***"An Overview of the Current Ozone Problem in the Northeastern and Midwestern U.S.,"*** In: Proceed. Mid-Atlantic States APCA Conf. on Hydrocarbon Control Feasibility, p. 98, New York, N.Y., April, 1977.

Wolff, G.T., P.J. Lioy, G.D. Wight, R.E. Meyers, and R.T.Cederwall, ***"An Investigation of Long-Range Transport of Ozone Across the Midwestern and Eastern U.S.,"*** Atmos. Environ. 11:797 (1977).

Pollutant	Town/Site	Objective
NO_2	Bridgeport 123	High Conc.
	East Hartford 003	High Conc.
	New Haven 123	High Conc.
Ozone	New Haven 123	Population
	Stratford 007	High Conc.
TSP	Bridgeport 009	Population
	Danbury 002	High Conc.
	Danbury 123	Population
	New Britain 007	High Conc.
	New Britain 008	Population
	Stratford 007	High Conc.
	Waterbury 005	Population
	Waterbury 007	High Conc.
SO_2	Bridgeport 123	High Conc.
	Milford 002	Source
	New Haven 123	High Conc.

- Regarding previous Air Quality Summaries:

1. In Section I.B. of the 1978-1981 editions, a portion of the third sentence in the third paragraph should be rewritten to read: "...the statewide average and standard deviation of the mean pollutant concentrations at the sites..."

2. Figure 1 and all references thereto should be ignored in favor of Figure 1 in the 1983 edition.

3. Table 2 in the 1978-1981 editions should be ignored in favor of relevant portions of Table 3 in the 1983 edition.

4. Paragraph I.F.2.b in the 1983 edition should be inserted into the appropriate areas of Section I.F in the 1978-1981 editions.

5. Table 7 in the 1981 edition is incomplete. The site Stamford 021 should be inserted with a first high of 85 on July 9 and a second high of 83 on March 29.

6. Table 22 in the 1981 edition contains erroneous data. The correct data can be found in Table 22 in the 1983 edition.

7. In the 1978-1981 editions, the last sentence in the second paragraph of Section VIII. CLIMATOLOGICAL DATA should be deleted.

8. In the 1981 edition, the same corrections should be made to Table 32 that were listed in Item 21 of the foregoing section regarding the 1982 Air Quality Summary.

ERRATA REPORTED IN THE 1982 AIR QUALITY SUMMARY

- Regarding the 1975 TSP data, all references to the following monitoring sites should be ignored: Enfield 123, Enfield 001/123, Danbury 001, Danbury 123, Danbury 001/123, Groton 001, Groton 123, Groton 001/123, Torrington 001, Torrington 123, Torrington 001/123. These sites either had insufficient data for a valid annual average concentration or they included data from two different sites.

- Regarding 1976 TSP data, all references to the following monitoring sites should be ignored: Stamford 003, Stamford 123, Stamford 003/123. These sites either had insufficient data for a valid annual average concentration or they included data from two different sites.

- Regarding 1980 TSP data, the following corrections have been made:

  1. Bridgeport 001: The number of samples for the year at this site has been changed from 57 to 58, and the annual geometric mean concentration has been changed from 47.8 to 47.6 $\mu g/m^3$.

  2. Bridgeport 123: the annual geometric mean concentration at this site has been changed from 64.2 to 63.8 $\mu g/m^3$.

  3. Greenwich 016: All references to this site should be ignored. This site is considered to have been unsuitably located for acceptable particulate monitoring.

  4. Morris 001: The standard deviation of the sampling data at this site has been changed from 1.567 to 1.557.

- Regarding 1981 TSP data, the following corrections have been made:

  1. Bristol 001: The number of samples for the year at this site has been changed from 55 to 58, and the annual geometric mean concentration has been changed from 34.1 to 34.6 $\mu g/m^3$.

- Regarding TSP data for the years 1975 through 1981, all references to sites Torrington 123 and Waterbury 123 should be ignored. These sites are now considered to have been unsuitably located for acceptable particulate monitoring.

- The above corrections, where relevant, are implicit in Table 2 and Table 8 of the 1982 Air Quality Summary. Accordingly, versions of these tables found in post-1974 (and pre-1982) editions of this document contain erroneous information and should be ignored or appropriately footnoted.

- Regarding Table 2, some of the earlier editions of this document have contained versions of this table which appeared to present annual "arithmetic" mean data. This is incorrect. All versions of this table contain annual "geometric" mean data.