SECTION IV.C. NITROGEN DIOXIDE

SOURCES

Approximately 70% of the oxides of nitrogen (NO_x) is from the automobile, the remainder being from stationary sources. Most of the NO_x is the colorless gas NO. In the atmosphere this compound reacts further to give the brown gas NO_2. NO_2 may also participate in a number of other reactions, some of which require sunlight. Since NO_2 is formed from both automotive and stationary source emissions, it is expected to be present in greatest concentration downwind of the heavy concentrations of traffic and industry. Meteorological conditions which limit dispersion also tend to raise NO_2 concentrations. Surface inversions and low wind speeds are examples. NO_2 is also affected by sunlight intensity.

GEOGRAPHICAL DISTRIBUTION

The federal standard for NO_2 is an annual arithmetic mean of .05 ppm. This standard is violated in a large area of Los Angeles County and the western portion of Orange County, with a small area in San Bernardino and Riverside counties in violation, extending as far east as San Bernardino and Riverside in some years. The highest annual means for NO_2 occur in Los Angeles County. Figures IV.C-1 to IV.C-3 show the geographic distribution of annual arithmetic mean of NO_2 for the years 1972, 1974 and 1976. Table IV.C-I lists the pertinent data for 1970-1976, and Table IV.C-II similar data for the Los Angeles Basin, 1956-1976.

Figures IV.C-4 to IV.C-6 show the geographical distribution of violations of the state standard for nitrogen dioxide (NO_2) and Table IV.C-III lists the pertinent data. The greatest number of violations occur, as expected, in the densely populated areas of Los Angeles and Orange counties.

SEASONAL

The monthly averages of daily maximum one hour NO_2 for 1976 at several representative sites in the South Coast Air Basin are shown in Figures IV.C-7 and IV.C-8. Anaheim, La Habra, and Lennox show definite seasonality, with higher concentrations in the late fall and winter months and lower in summer. The relative magnitude differs by roughly a factor of two. At Central Los Angeles and San Bernardino there is only a slight seasonal difference, and at Riverside no seasonal difference is seen (see Table IV.C-IV).

In Figure IV.C-8, the number of violations of the state standard for each month of 1976 has been plotted for each of two stations. West Los Angeles shows the greatest number of violations in late fall and winter and fewest in spring and summer. In Central Los Angeles late fall and early winter were high, but the month of August was also high.

DIURNAL DISTRIBUTION

Figures IV.C-9 and IV.C-10 depict both the seasonal and diurnal variation in NO_2 concentration at several locations. At most locations there is an easily distinguished peak which occurs at about the end of the morning traffic rush-hour period. The NO_2 peak lags behind the carbon monoxide (CO) peak by a couple of hours. This is reasonable since CO is emitted from vehicles directly, whereas NO_2 is formed in the atmosphere by chemical reaction of NO.

At Central Los Angeles, Anaheim, Azusa, and Riverside diurnal patterns for summer months differ from late fall and winter months. In summer, concentrations drop after the morning peak and remain below the peak level for the rest of the day, as NO_2 participates in the photochemical reaction leading to ozone formation. In winter, concentrations start to rise again after the morning peak and reach even higher levels during the afternoon. The difference no doubt arises from a combination of meteorological effects. Variation in sunlight intensity affects the photochemical reactions in which NO_2 participates. Shorter days and lower intensity sunlight in winter prevent completion of the photochemical reaction. Hence, ozone is not formed in quantity and NO_2, a mid-product in the reaction, accumulates. Furthermore, seasonal changes in wind speed and

direction, inversion base height and mixing height affect the dispersal and transport and, therefore, the observed concentrations of NO_2. The precise relationship between these quantities is as yet unknown.

Figures IV.C-11 through IV.C-13 present diurnal data for oxides of nitrogen (NO_x), the precursor of NO_2. As emitted, NO_x is composed mainly of nitric oxide (NO), which, as stated earlier, is oxidized in the atmosphere to NO_2. The morning NO peaks usually coincide with CO, whereas the NO_2 peaks usually occur several hours later.

FREQUENCY DISTRIBUTION

In Figures IV.C-14 to IV.C-16 the frequency distributions of daily maximum hourly average NO_2 are given for the years 1972, 1974, and 1976 at several stations. There is no clear upward or downward trend indicated throughout the basin.

TRENDS

Several annual statistics for NO_2 concentrations at five sites have been plotted in Figures IV.C-17 to IV.C-22 for the years 1972-1976. Supporting data are presented in Table IV.C-V. West Los Angeles has shown increase in NO_2 concentration during the period. Riverside concentrations have gone up slightly. In San Bernardino, however, NO_2 appears to have gone down. Central Los Angeles NO_2 appears to have

gone down slightly. Anaheim and La Habra data have shown no clear tendency to go up or down. Overall, there appears to be no clear NO_2 trend in the South Coast Air Basin.

Available annual maximum one-hour concentrations of NO_2 are listed by station, for the period 1956-1976 in Table IV.C-VI. No consistent trends are indicated throughout the South Coast Basin. Highest concentrations are found most frequently in the western part of the Basin.

SUMMARY

Attainment of the nitrogen dioxide standards is a problem mainly in densely populated Los Angeles County. During the period 1972-1976, no clear up trend or down-trend has occurred in the South Coast Air Basin.

The effect of meteorology has not yet been precisely determined for this contaminant.

LIST OF FIGURES

Nitrogen Dioxide

Figure No.	Title
IV.C-1	Nitrogen Dioxide Annual Arithmetic Mean, ppm - 1972
IV.C-2	Nitrogen Dioxide Annual Arithmetic Mean, ppm - 1974
IV.C-3	Nitrogen Dioxide Annual Arithmetic Mean, ppm - 1976
IV.C-4	Nitrogen Dioxide Number of Days Violating State Standard (1-Hr. Avg. $NO_2 \geq 0.25$ ppm) - 1972
IV.C-5	Nitrogen Dioxide Number of Days Violating State Standard (1-Hr. Avg. $NO_2 \geq 0.25$ ppm) - 1974
IV.C-6	Nitrogen Dioxide Number of Days Violating State Standard (1-Hr. Avg. $NO_2 \geq 0.25$ ppm) -1976
IV.C-7	Nitrogen Dioxide Monthly Mean of Daily Max. 1-Hr., ppm - 1976
IV.C-8	Nitrogen Dioxide Monthly Mean of Daily Max. 1-Hr., ppm - 1976
IV.C-9	Diurnal Nitrogen Dioxide Concentrations Summer vs. Winter (Azusa, Central L.A., Lennox)
IV.C-10	Diurnal Nitrogen Dioxide Concentrations Summer vs. Winter (San Bernardino, Riverside, Anaheim)
IV.C-11	Diurnal Oxides of Nitrogen Concentrations Summer vs. Winter (Azusa, Anaheim)

LIST OF FIGURES

Nitrogen Dioxide

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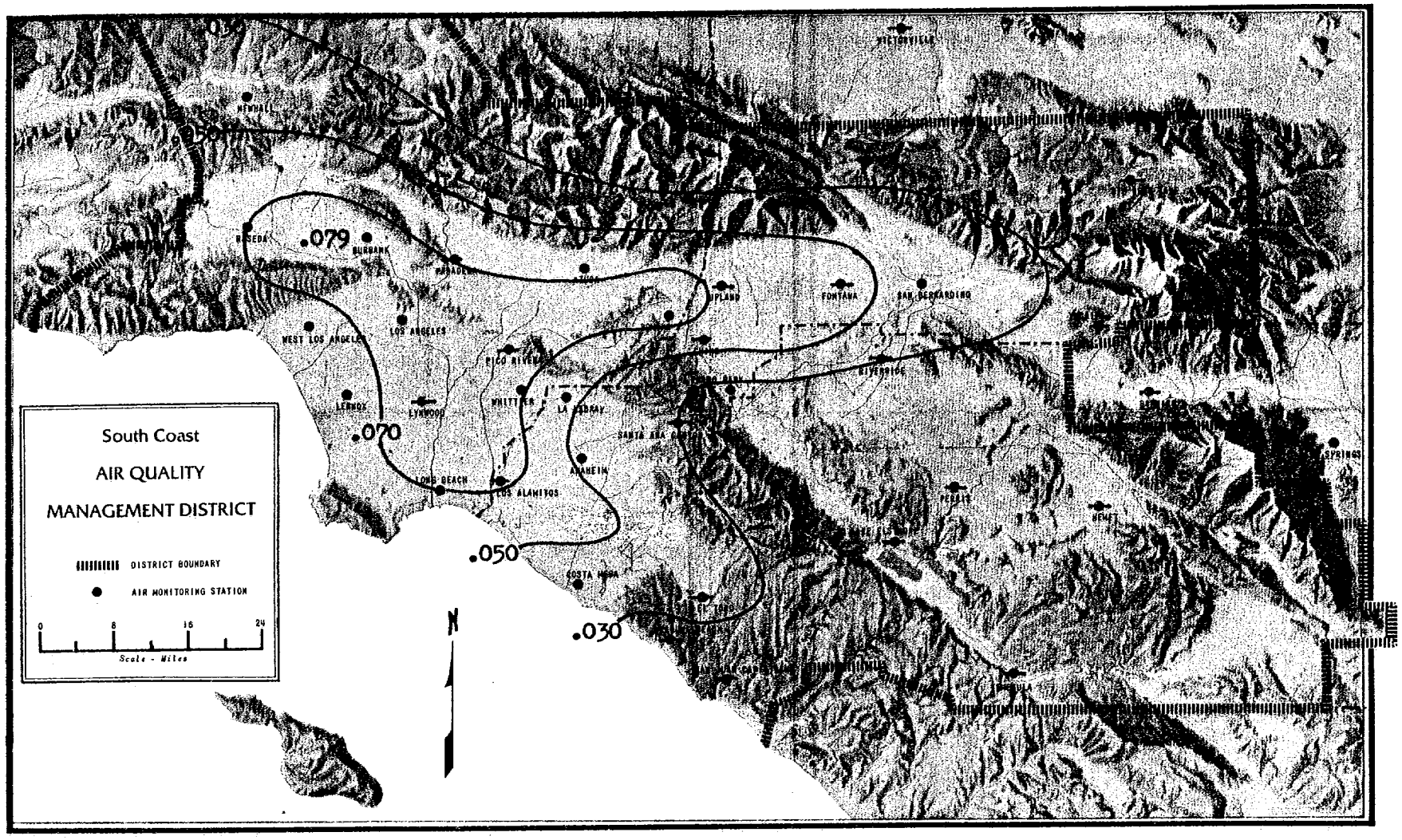
Figure No.	Title
IV.C-12	Diurnal Oxides of Nitrogen Concentrations Summer vs. Winter (Riverside, Central L.A.)
IV.C-13	Diurnal Oxides of Nitrogen Concentrations Summer vs. Winter (San Bernardino, Lennox)
IV.C-14	Nitrogen Dioxide, Frequency Distribution (Daily Max. 1-Hr. Avg. - ppm) (Downtown L.A., W. Los Angeles)
IV.C-15	Nitrogen Dioxide, Frequency Distribution (Daily Max. 1-Hr. Avg. - ppm)
IV.C-16	Nitrogen Dioxide, Frequency Distribution (Daily Max. 1-Hr. Avg. - ppm)
IV.C-17	Trends: Nitrogen Dioxide Los Angeles
IV.C-18	Trends: Nitrogen Dioxide West Los Angeles
IV.C-19	Trends: Nitrogen Dioxide Anaheim
IV.C-20	Trends: Nitrogen Dioxide La Habra
IV.C-21	Trends: Nitrogen Dioxide Riverside
IV.C-22	Trends: Nitrogen Dioxide San Bernardino

LIST OF TABLES

Nitrogen Dioxide

Table No.	Title
IV.C-I	Nitrogen Dioxide Annual Arithmetic Mean,ppm
IV.C-II	Summary of Annual Averages of Daily 1-Hr. Nitrogen Dioxide Maxima, 1955 - 1975
IV.C-III	Nitrogen Dioxide Number of Days Violating State Standard (1-Hr. Avg. $NO_2 \geq 0.25$ ppm)
IV.C-IV	Nitrogen Dioxide Monthly Mean of Daily Max. 1-Hr., ppm - 1976 -
IV.C-V	Data Summary - Nitrogen Dioxide, ppm
IV.C-VI	Nitrogen Dioxide - Annual Max. 1-Hr., ppm

NITROGEN DIOXIDE
ANNUAL ARITHMETIC MEAN, PPM
1972

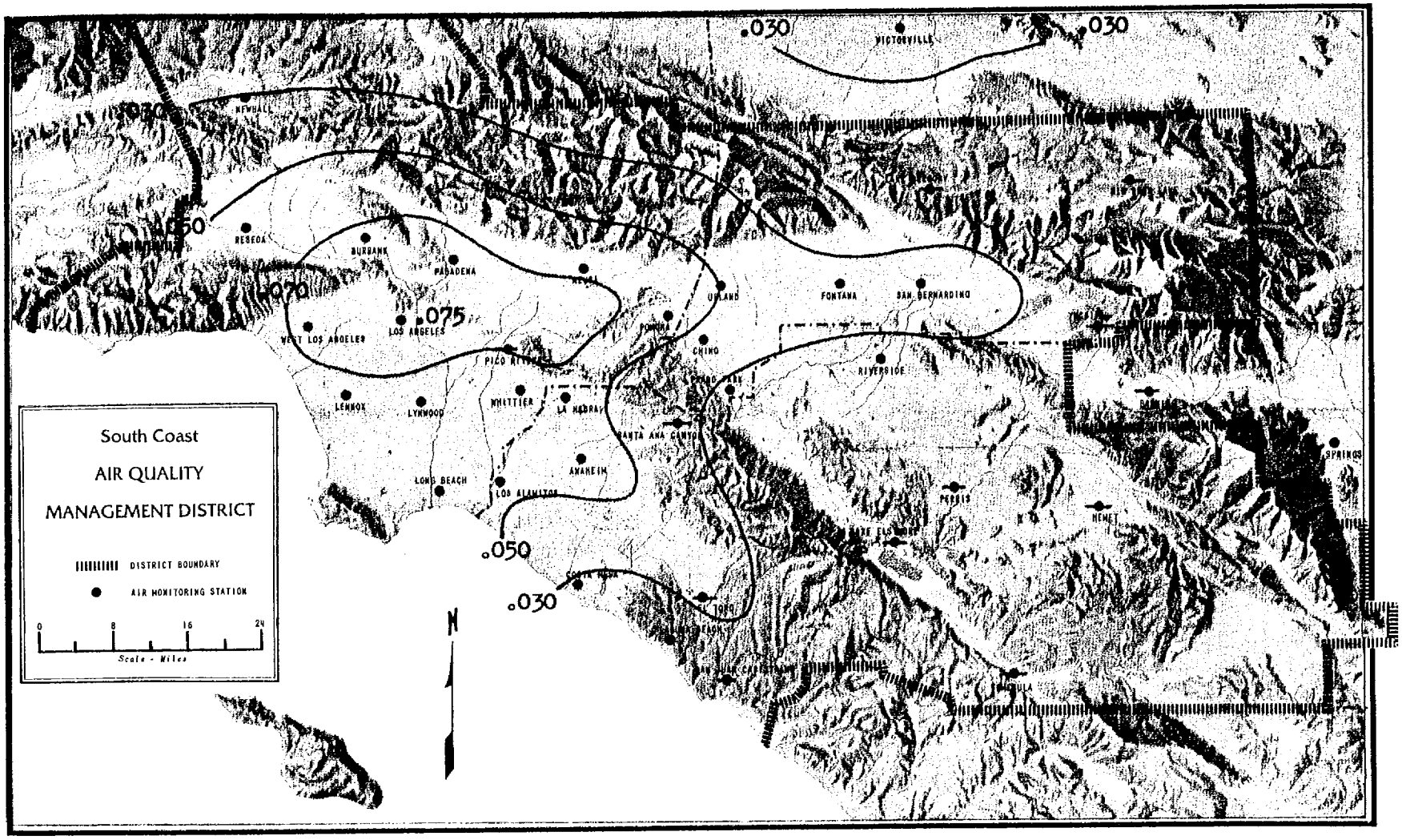


Less than 9 months of data.

RPG 9/06/77

Figure IV.C-1

NITROGEN DIOXIDE
ANNUAL ARITHMETIC MEAN, PPM
1974

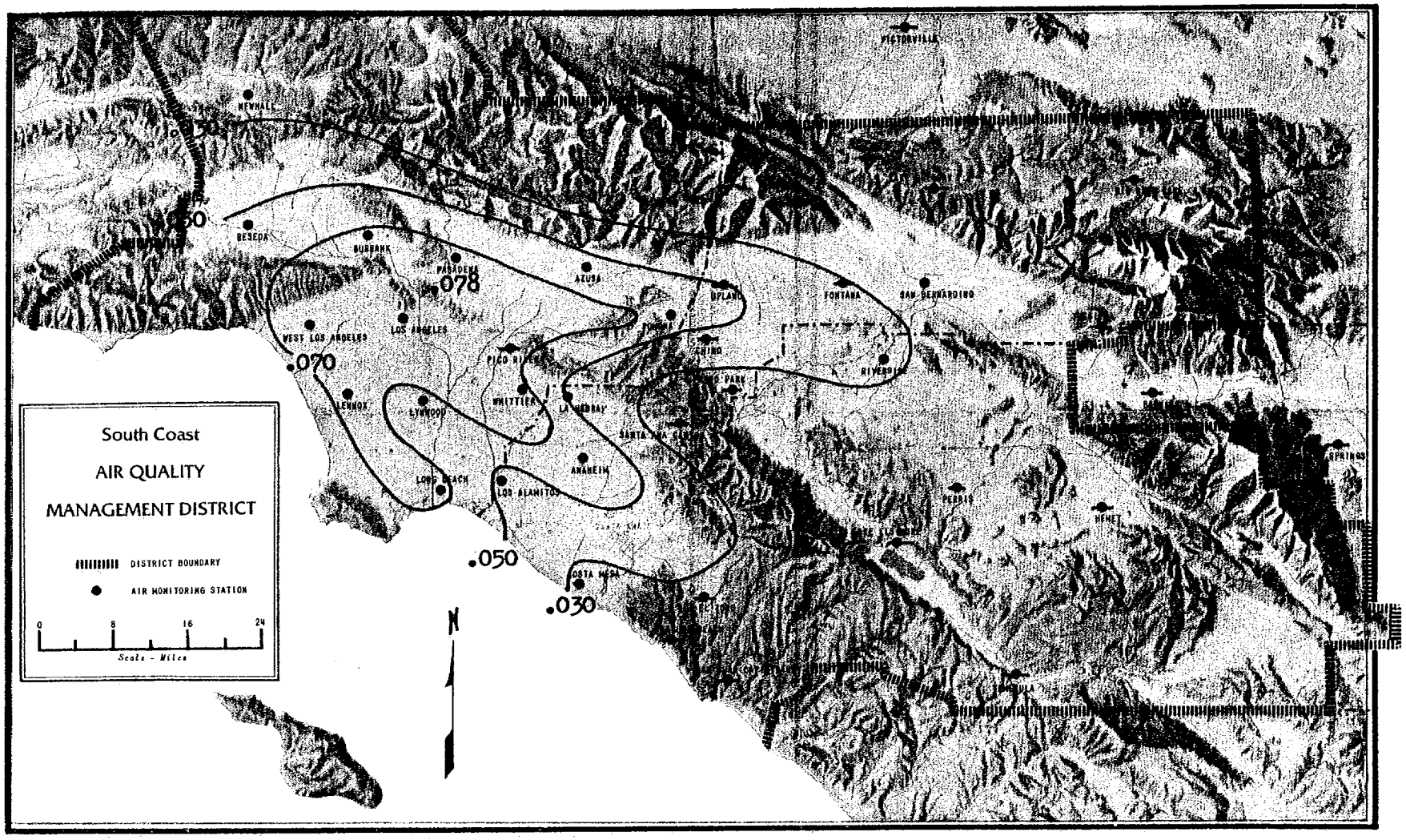


Less than 9 months of data.

RPG 9/06/77

Figure IV.C-2

NITROGEN DIOXIDE
ANNUAL ARITHMETIC MEAN, PPM
1976



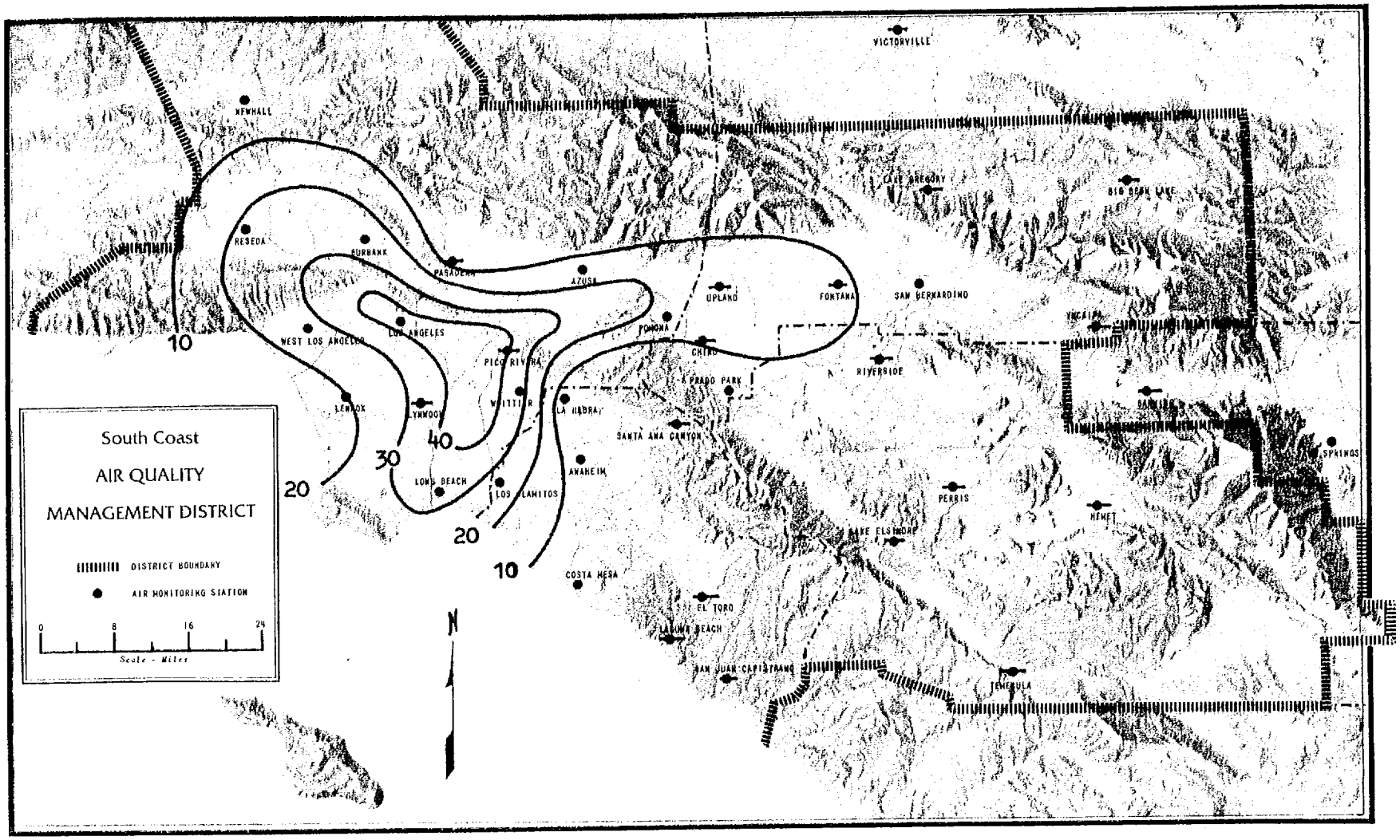
Less than 9 months of data.

Figure IV.C-3

NITROGEN DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $NO_2 \geqq 0.25$ ppm)

1972



Less than 9 months of data.

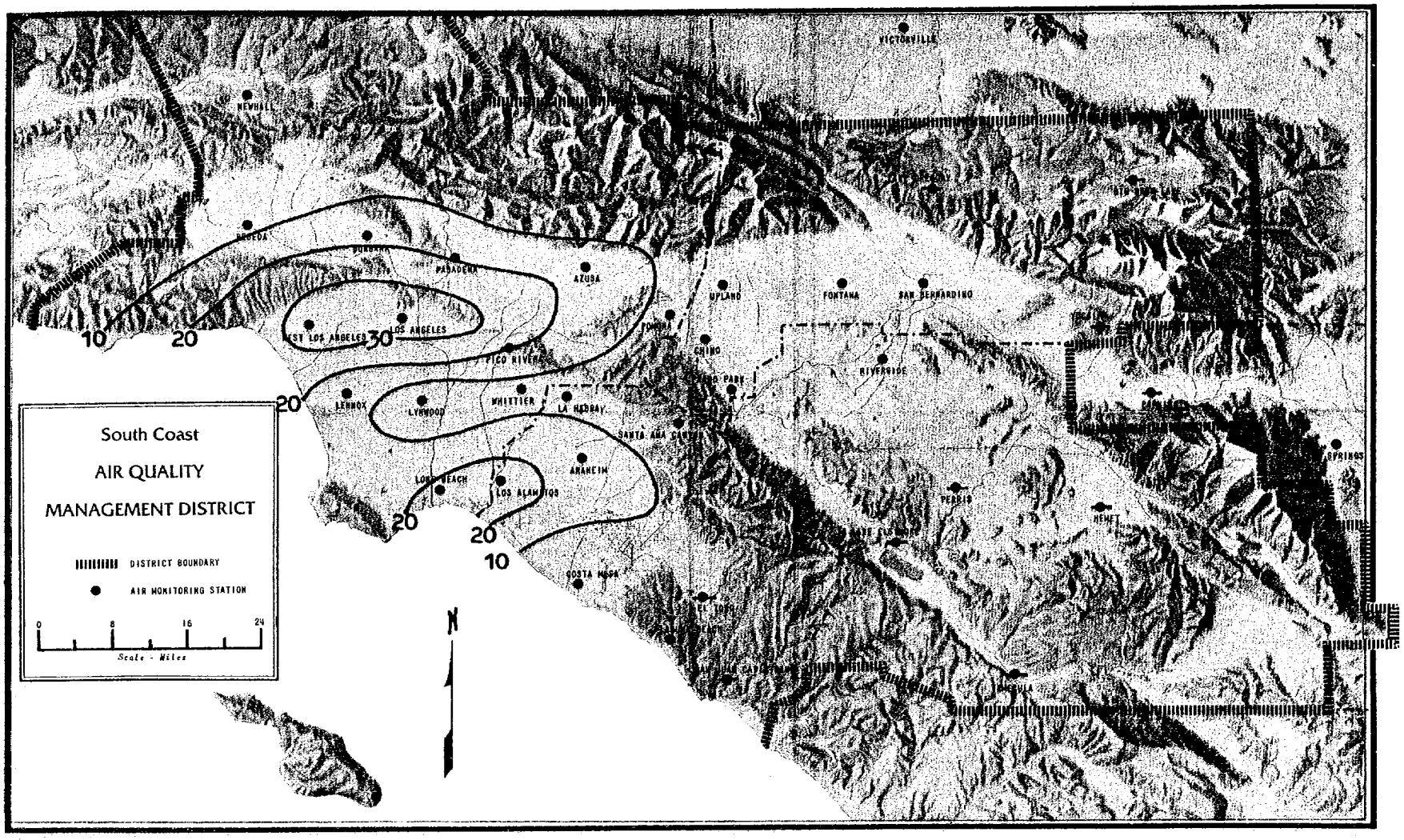
RPG 9/06/77

Figure IV.C-4

NITROGEN DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $NO_2 \geq 0.25$ ppm)

1974



Less than 9 months of data.

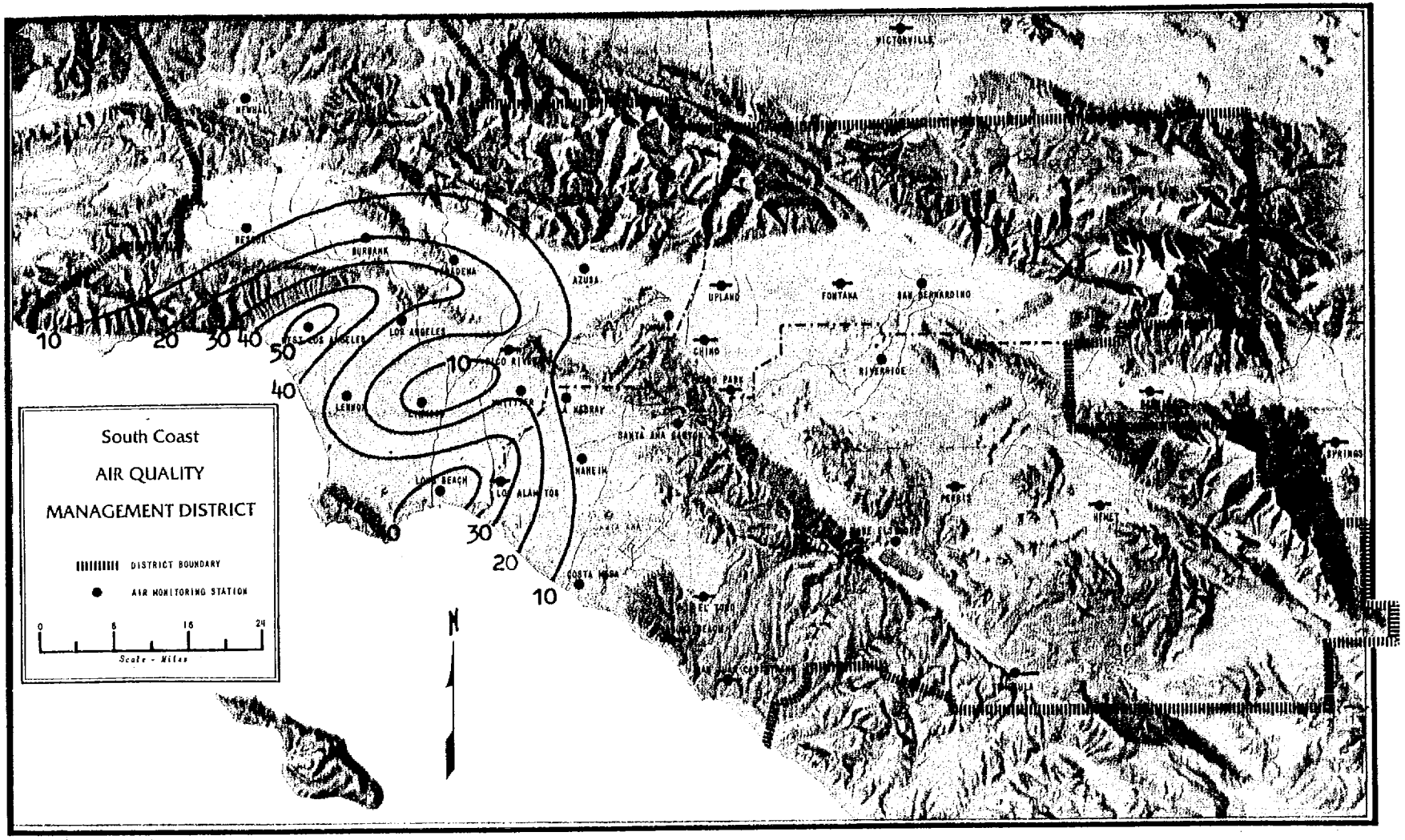
RPG 9/06/77

Figure IV.C-5

NITROGEN DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $NO_2 \geq 0.25$ ppm)

1976



Less than 9 months of data.

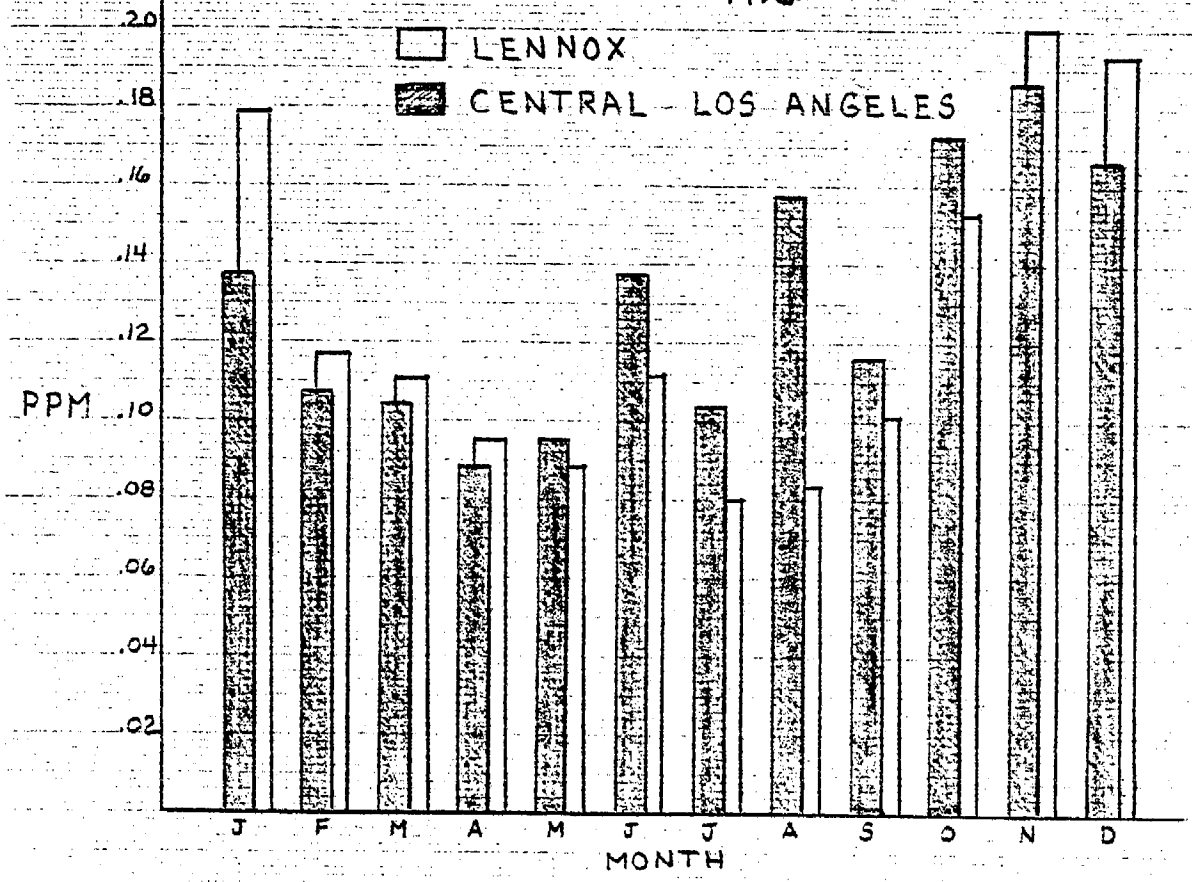
RPG 9/06/77

Figure IV.C-6

NITROGEN DIOXIDE

MONTHLY MEAN OF DAILY MAX. 1-HR., PPM

1976



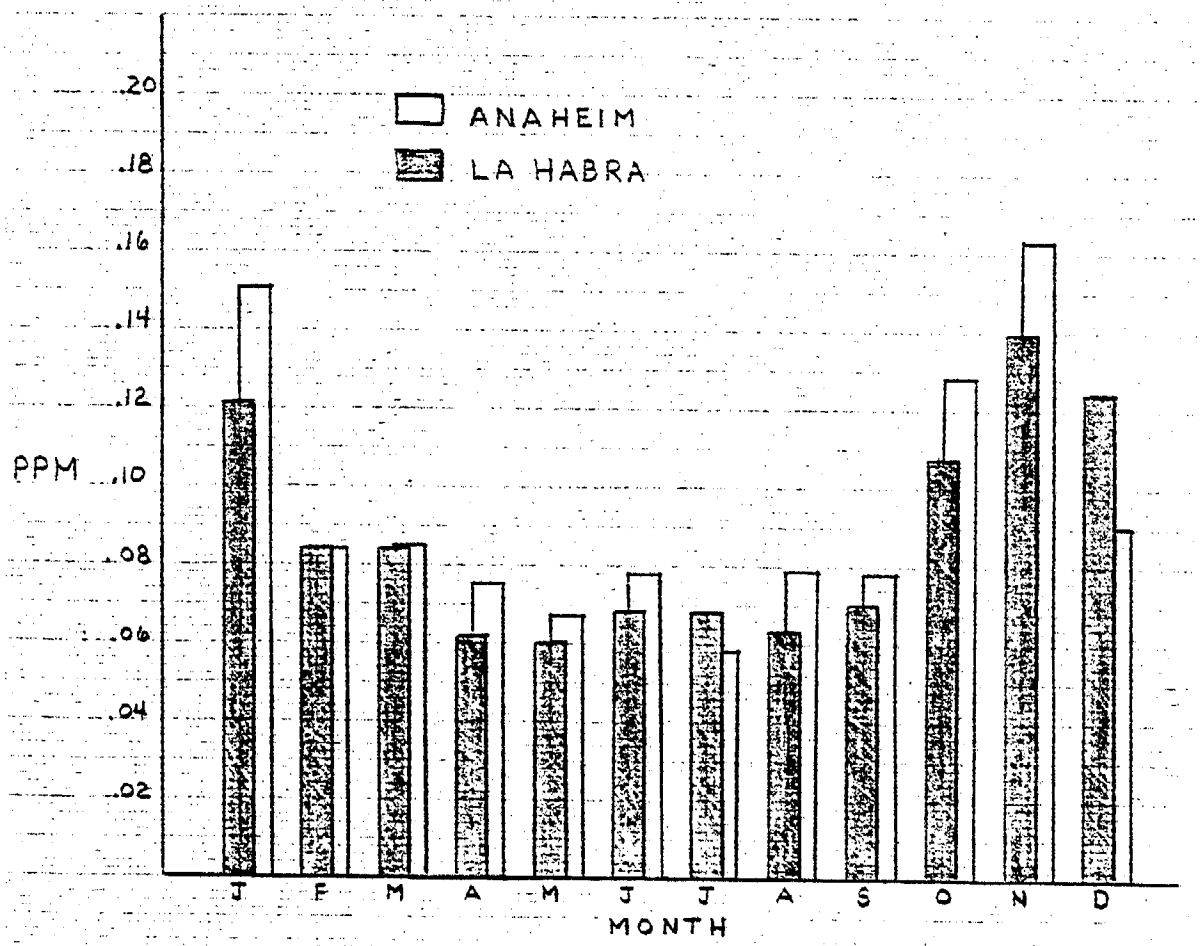
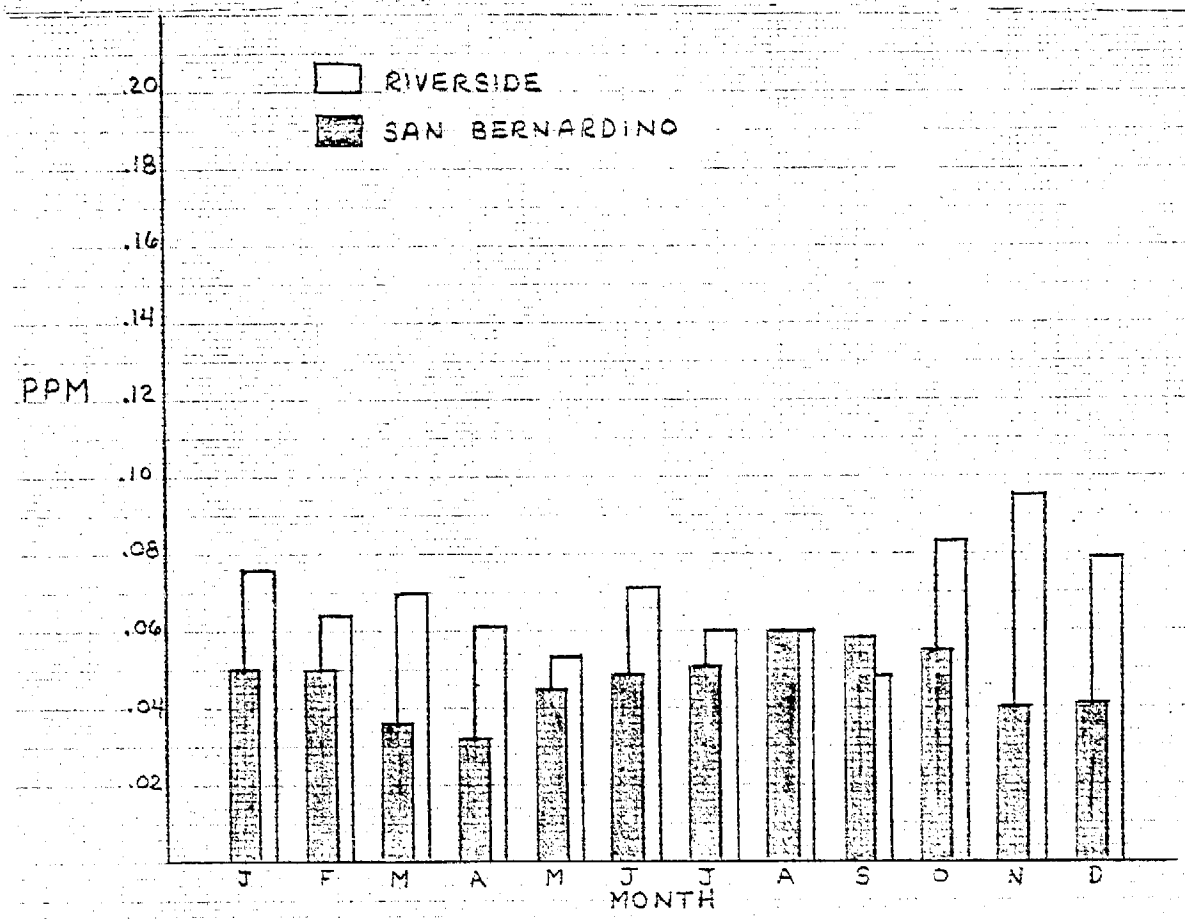
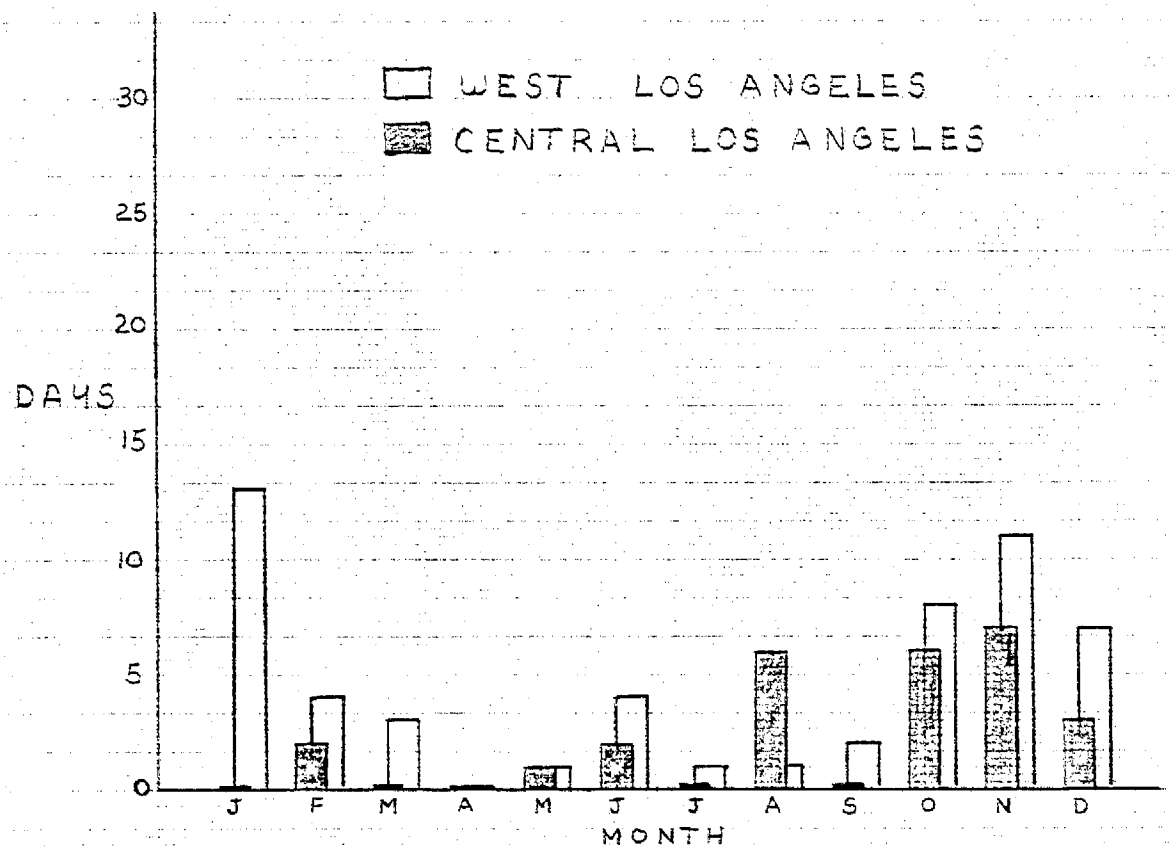


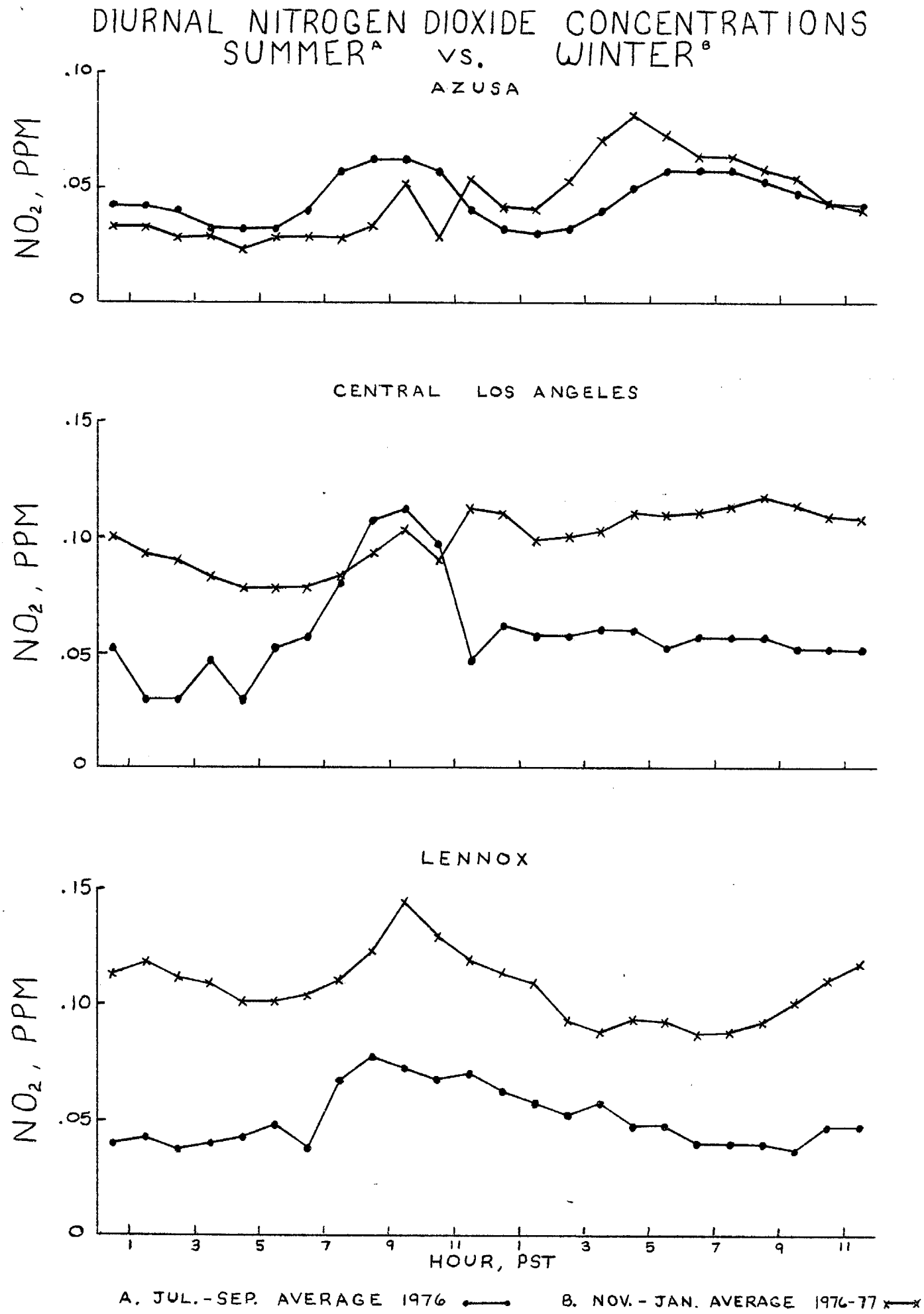
Figure IV.C-8

NITROGEN DIOXIDE
MONTHLY MEAN OF DAILY MAX. 1-HR., PPM
1976

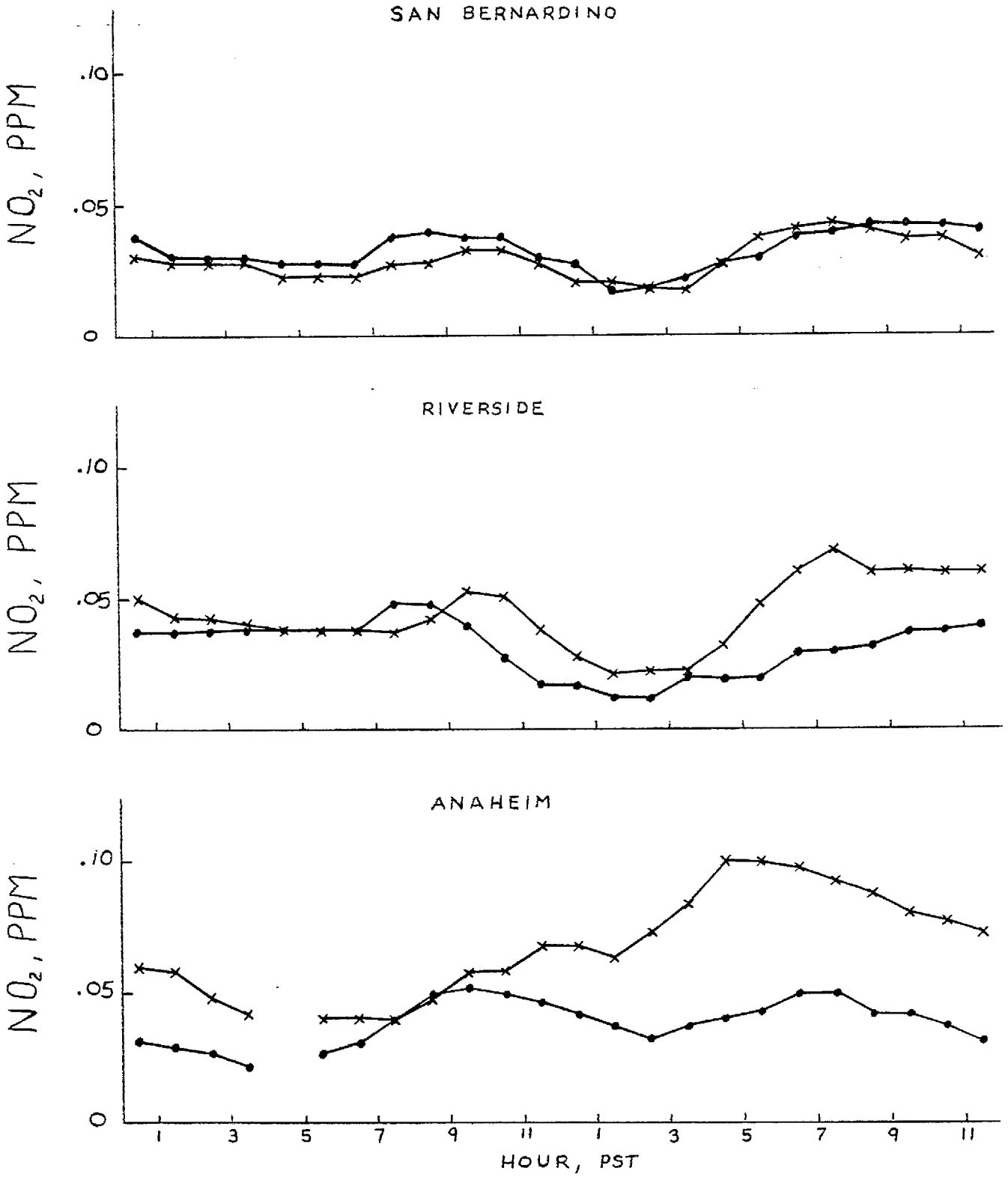


SEASONAL DISTRIBUTION OF DAYS ON WHICH
NITROGEN DIOXIDE (1-HR. AVG.) ≥ 0.25 PPM




DIURNAL NITROGEN DIOXIDE CONCENTRATIONS
SUMMER[A] VS. WINTER[B]
AZUSA
CENTRAL LOS ANGELES
LENNOX
NO_2, PPM
.15
.10
.05
0
1
3
5
7
9
11
HOUR, PST
A. JUL.-SEP. AVERAGE 1976
B. NOV.-JAN. AVERAGE 1976-77

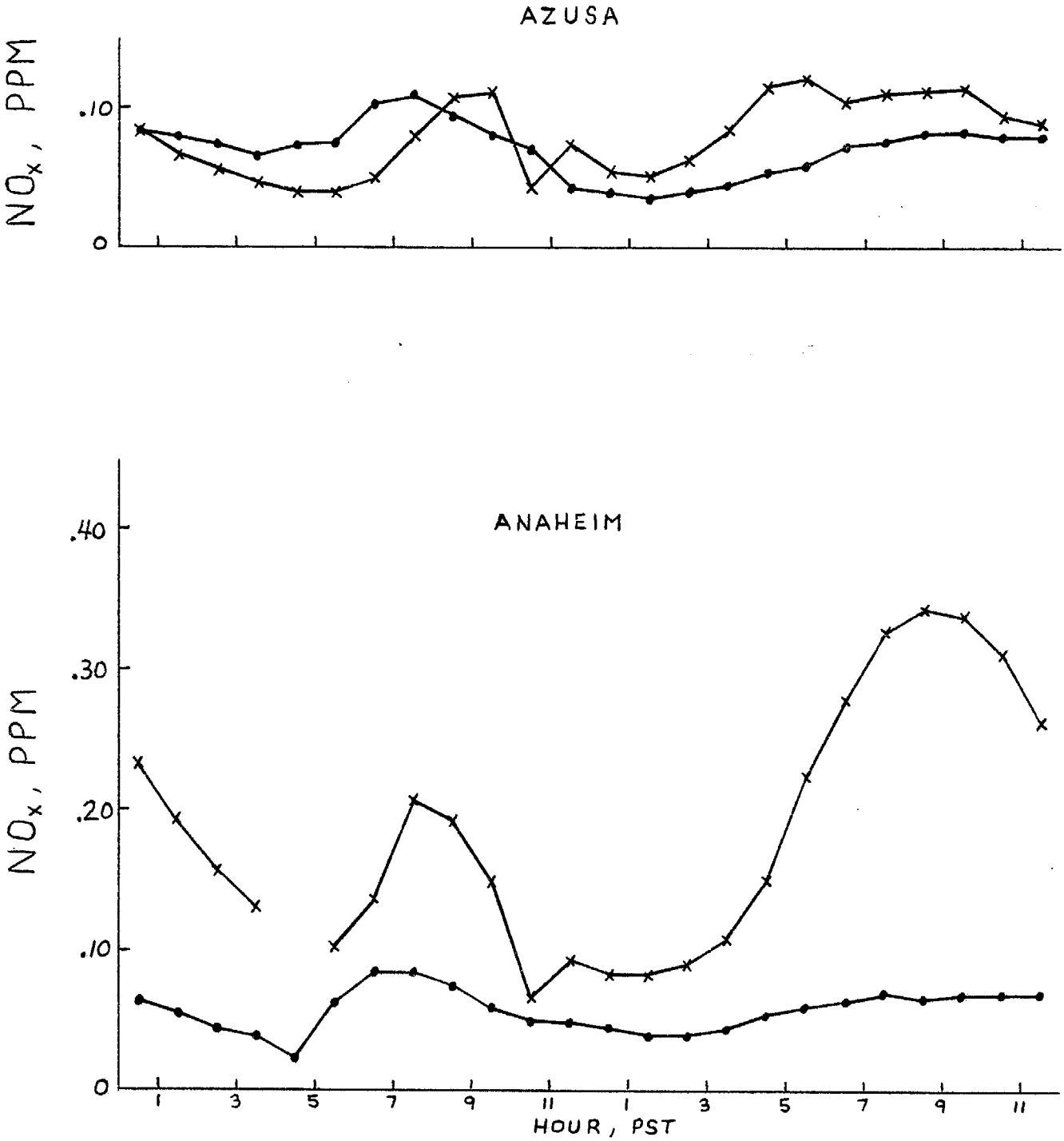
DIURNAL NITROGEN DIOXIDE CONCENTRATIONS SUMMER[A] vs. WINTER[B]



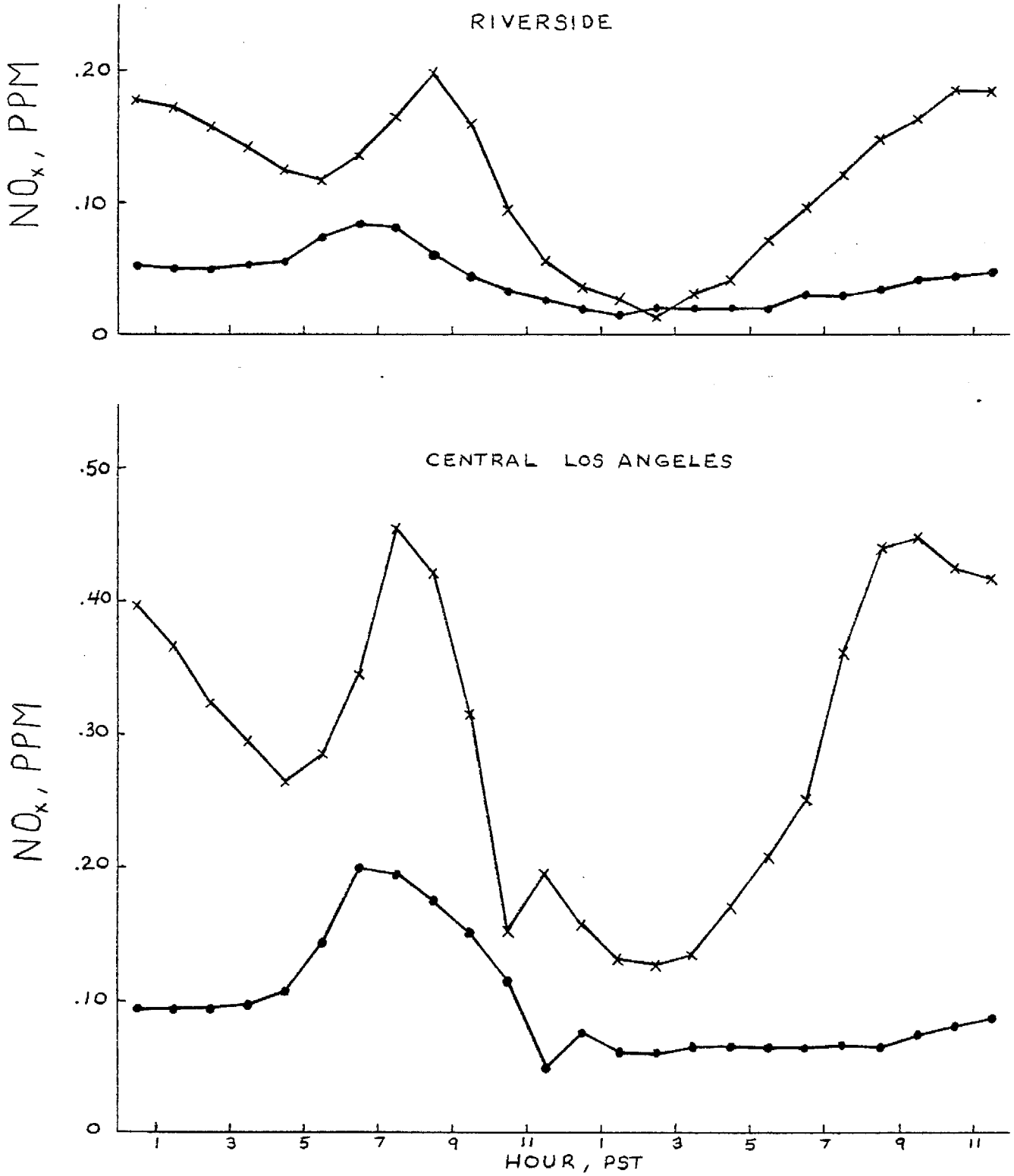
A. JUL. - SEP. AVERAGE 1976 ●——●

B. NOV. - JAN. AVERAGE 1976-77 ×——×

DIURNAL OXIDES OF NITROGEN CONCENTRATIONS SUMMER[A] vs. WINTER[B]



DIURNAL OXIDES OF NITROGEN CONCENTRATIONS
SUMMER[A] vs. WINTER[B]

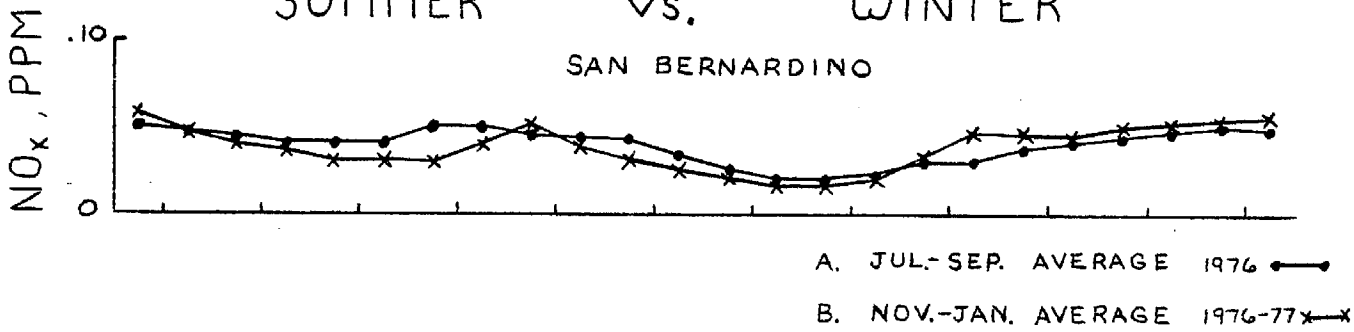


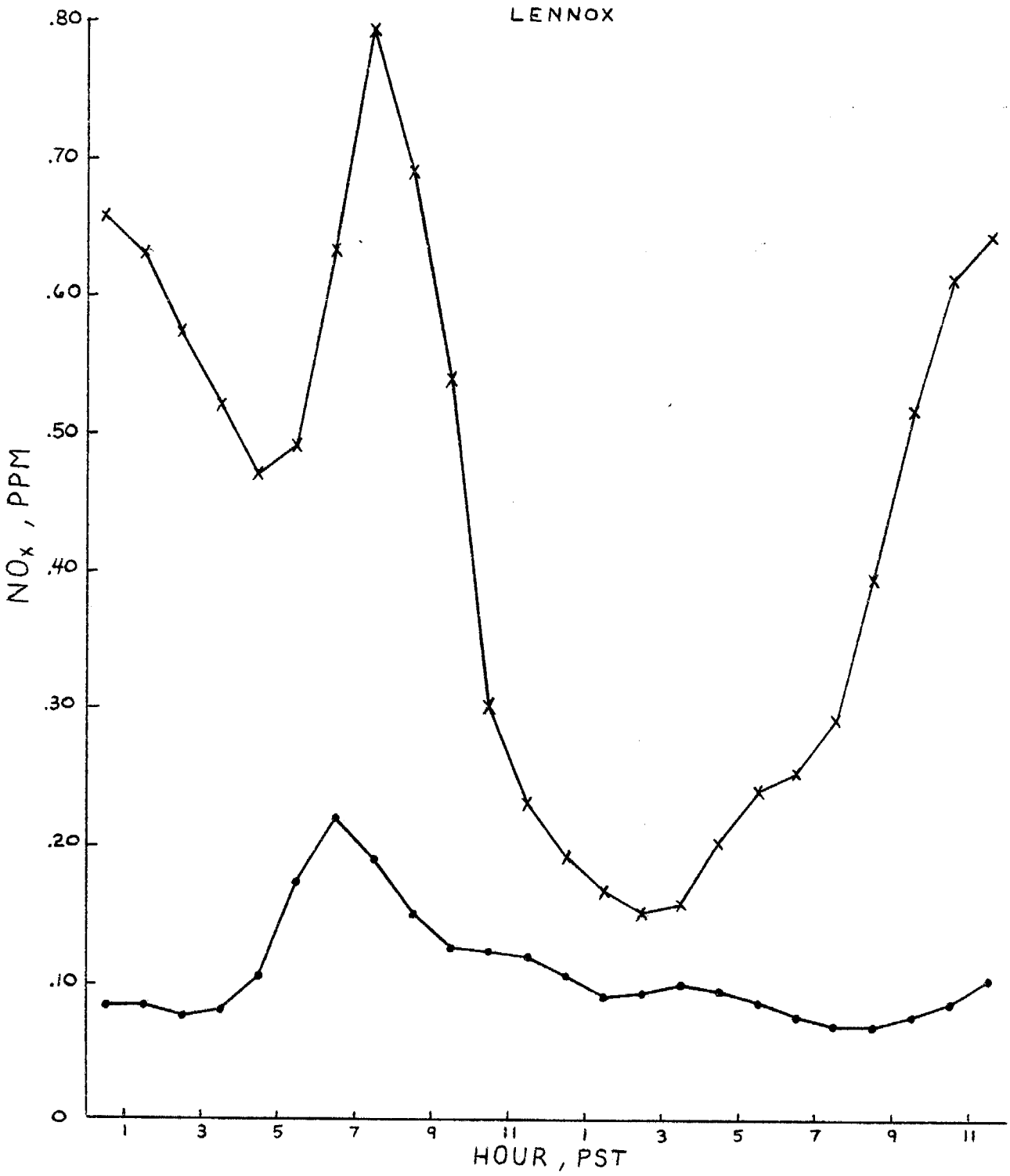
A. JUL.-SEP. AVERAGE 1976 ●——●

B. NOV.-JAN. AVERAGE 1976-77 ×——×

Figure IV.C-13

DIURNAL OXIDES OF NITROGEN CONCENTRATIONS SUMMER[A] VS. WINTER[B]





NITROGEN DIOXIDE

Daily Max. 1-Hour Average - ppm

DOWNTOWN LOS ANGELES

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	361	0.39	0.02	0.14	± 0.08
1973	353	0.58	0.03	0.12	± 0.07
1974	363	0.64	0.03	0.13	± 0.08
1975	358	0.56	0.01	0.13	± 0.09
1976	360	0.53	0.03	0.13	± 0.07

WEST LOS ANGELES

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	357	0.42	0.01	0.12	± 0.08
1973	358	0.47	0.03	0.13	± 0.07
1974	363	0.76	0.04	0.14	± 0.08
1975	360	0.60	0.01	0.13	± 0.09
1976	363	0.46	0.03	0.15	± 0.09

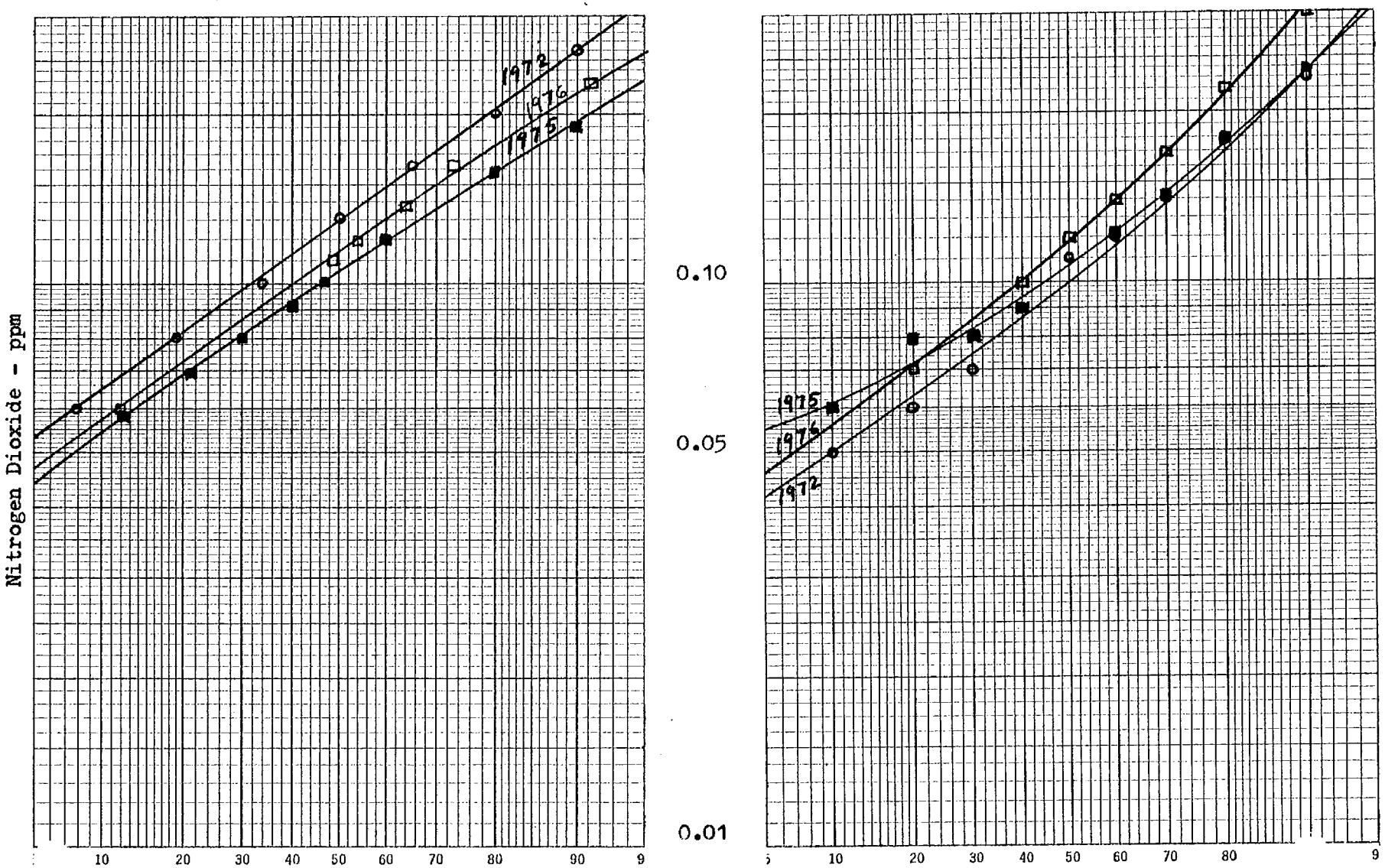


Figure IV.C.1

NITROGEN DIOXIDE

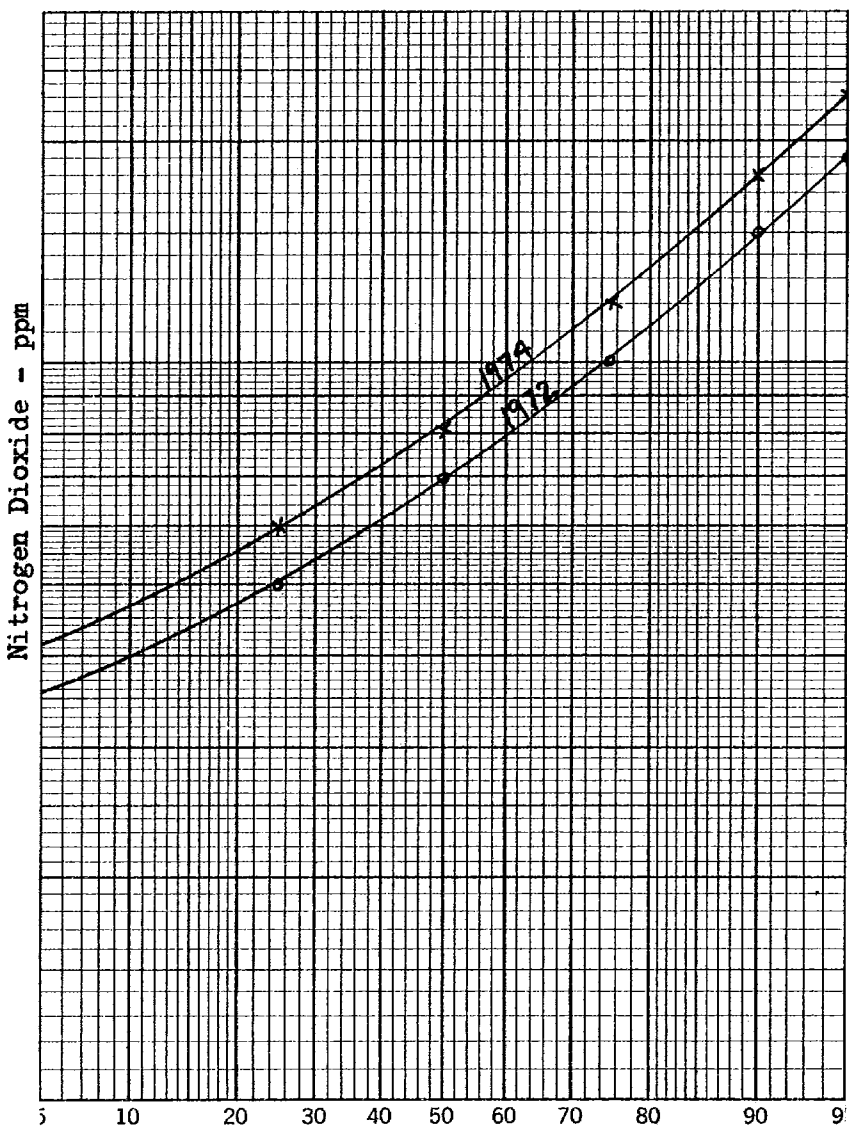
Daily Max. 1-H[illegible] Average - ppm

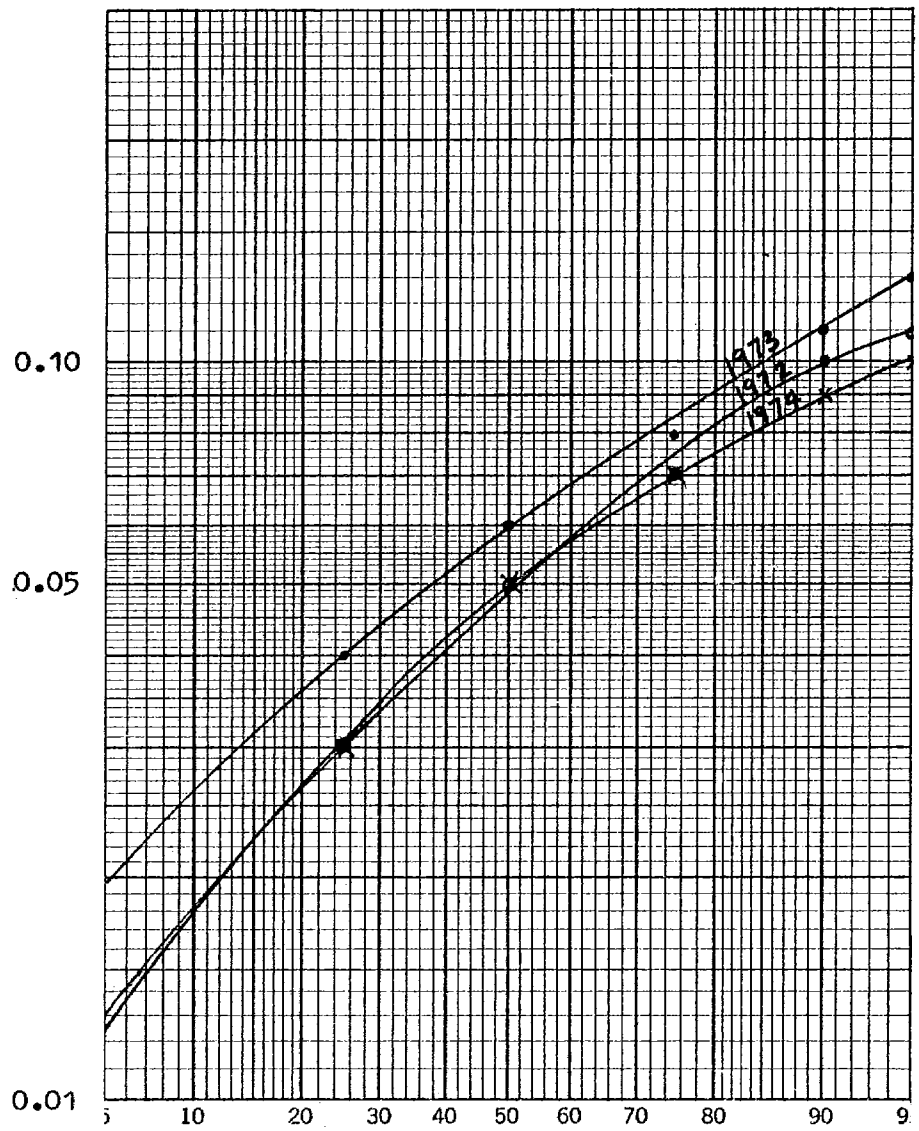
ANAHEIM

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Std.Dev.
1972	358	0.33	-	0.08	± 0.05
1973	329	0.49	-	0.09	± 0.06
1974	360	0.37	-	0.10	± 0.06
1975	346	0.50	-	0.09	± 0.06

RIVERSIDE-RUBIDOUX

Year	N	Max.	Min.	Arithmetic Mean	Std.Dev.
1972	118	0.16	-	0.06	± 0.03
1973	363	0.18	-	0.06	± 0.03
1974	362	0.20	-	0.06	± 0.03
1975	361	0.21	-	0.06	± 0.03





Concentration equal to or less than stated percentage.

Figure IV.C-15

NITROGEN DIOXIDE

(Daily Max. 1-Hour Average - ppm)

SAN BERNARDINO

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Std. Dev.
1972	341	0.29	-	0.08	± 0.04
1973	356	0.19	-	0.08	± 0.03
1974	351	0.45	-	0.09	± 0.05
1975	355	0.25	-	0.08	± 0.05

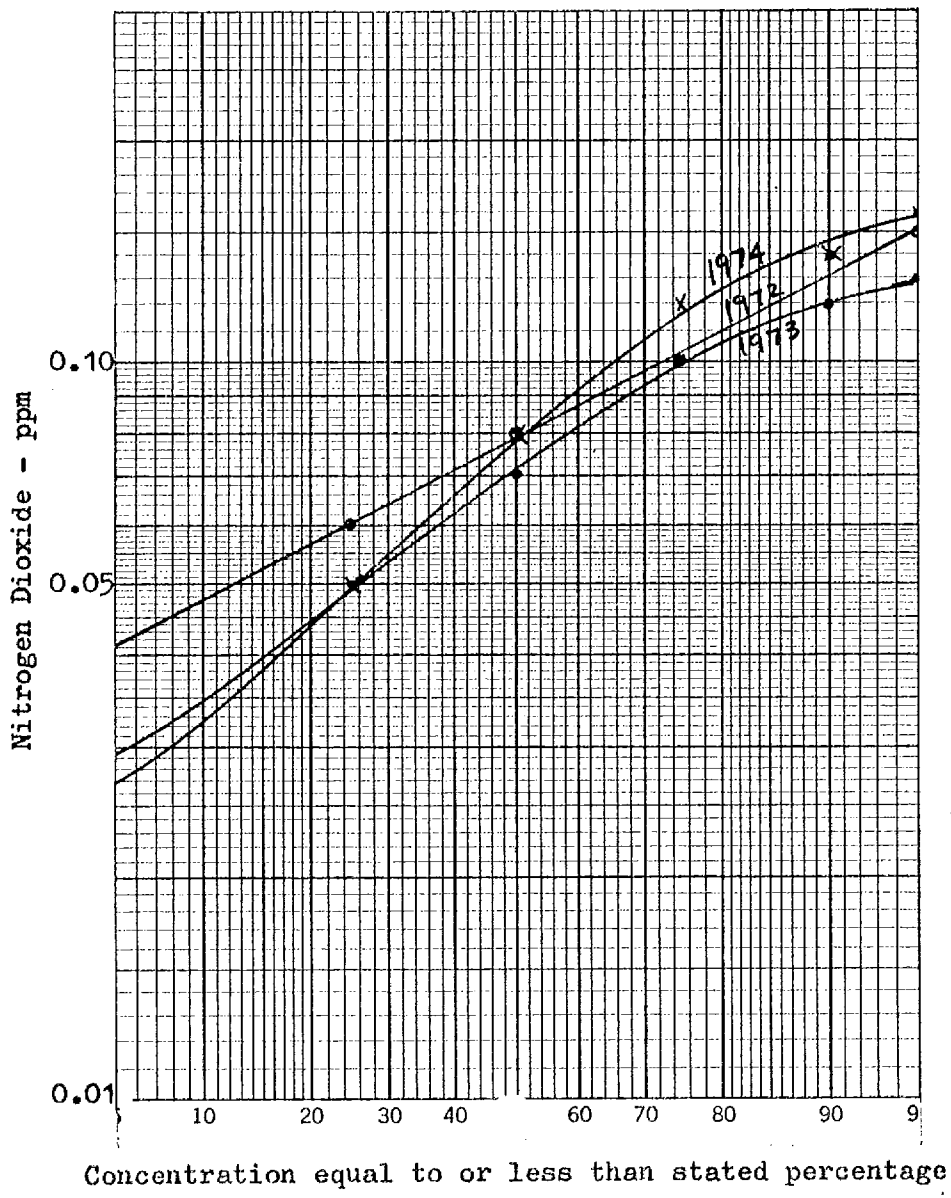
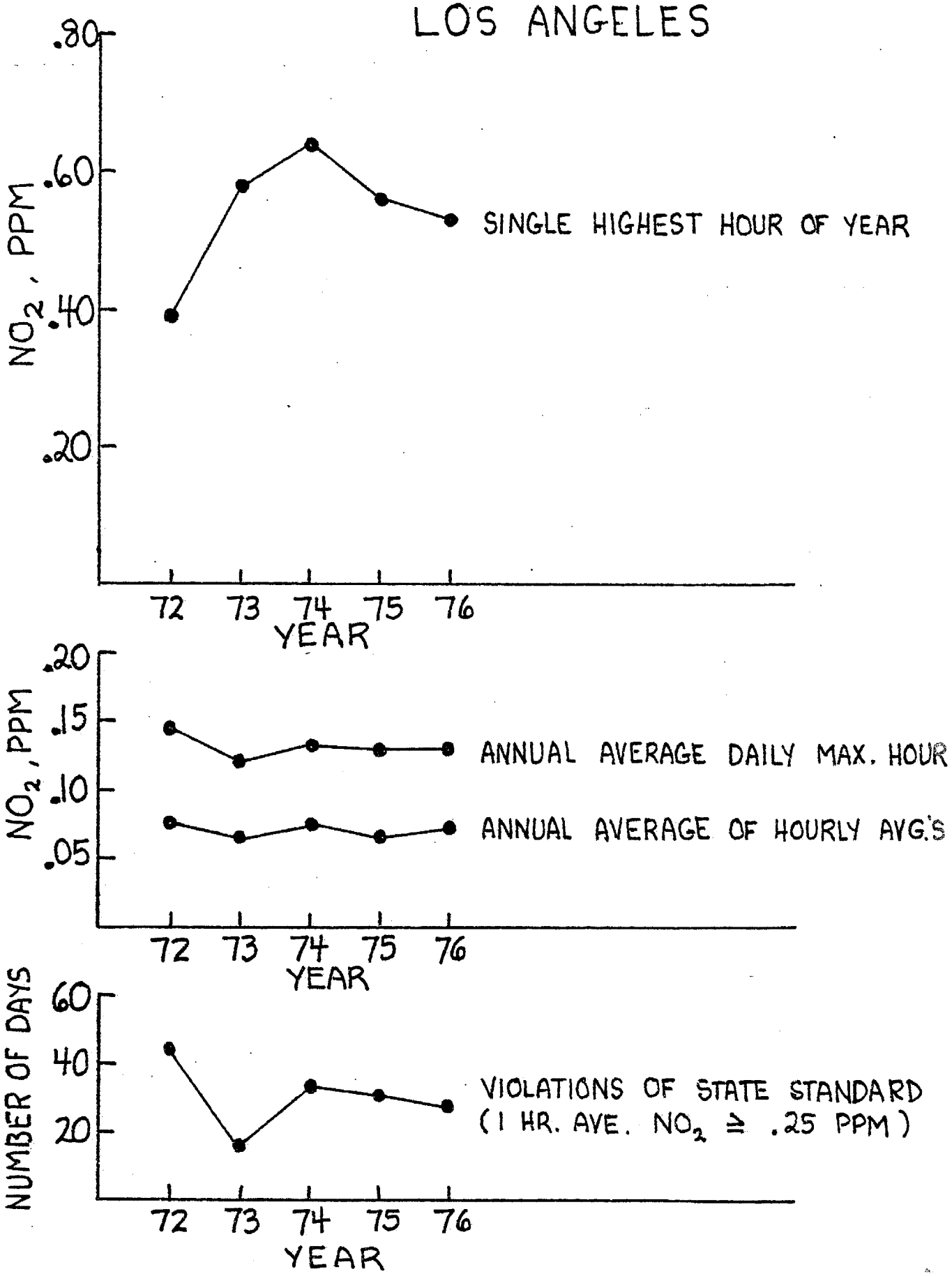


Figure IV.C-16

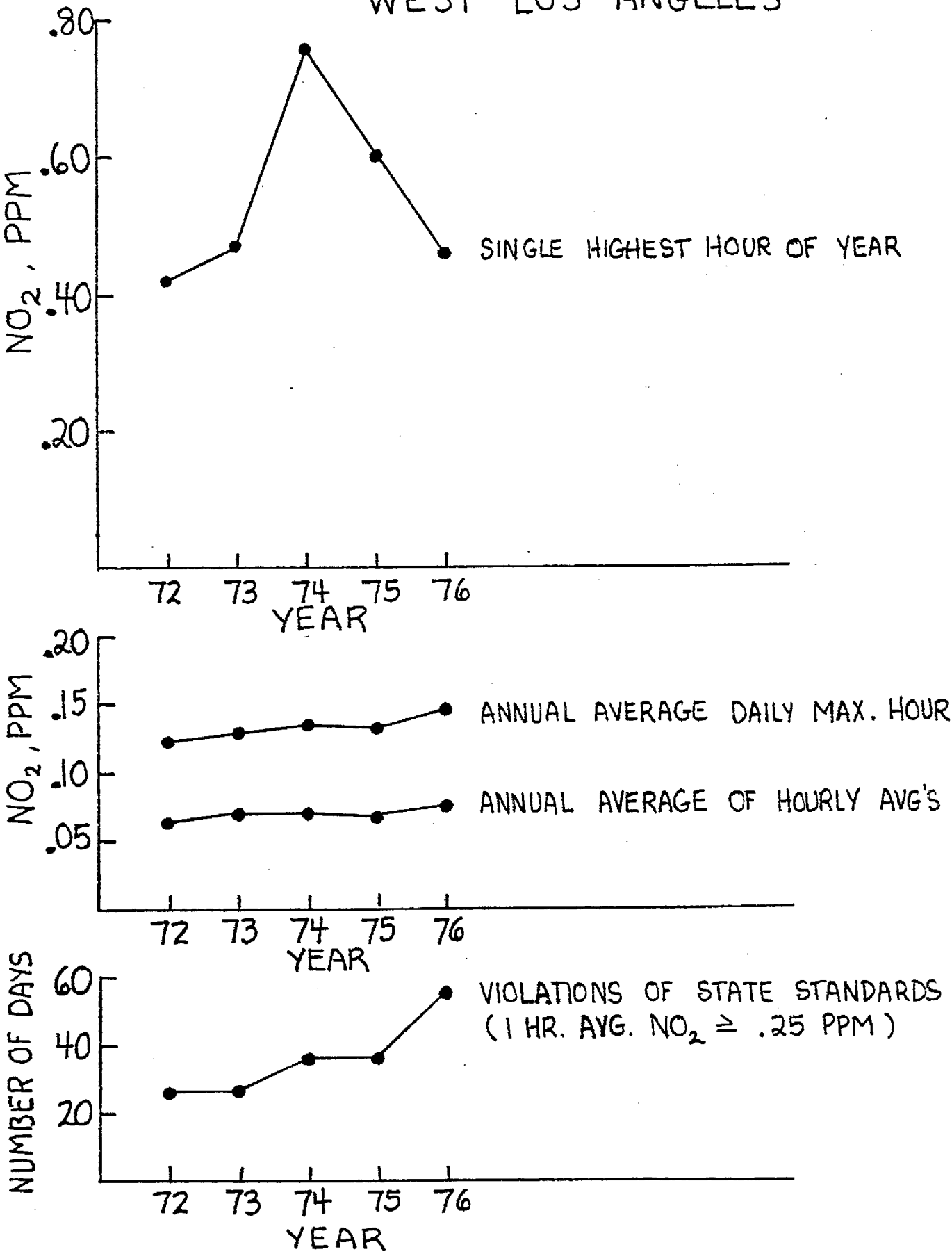
NITROGEN DIOXIDE

LOS ANGELES

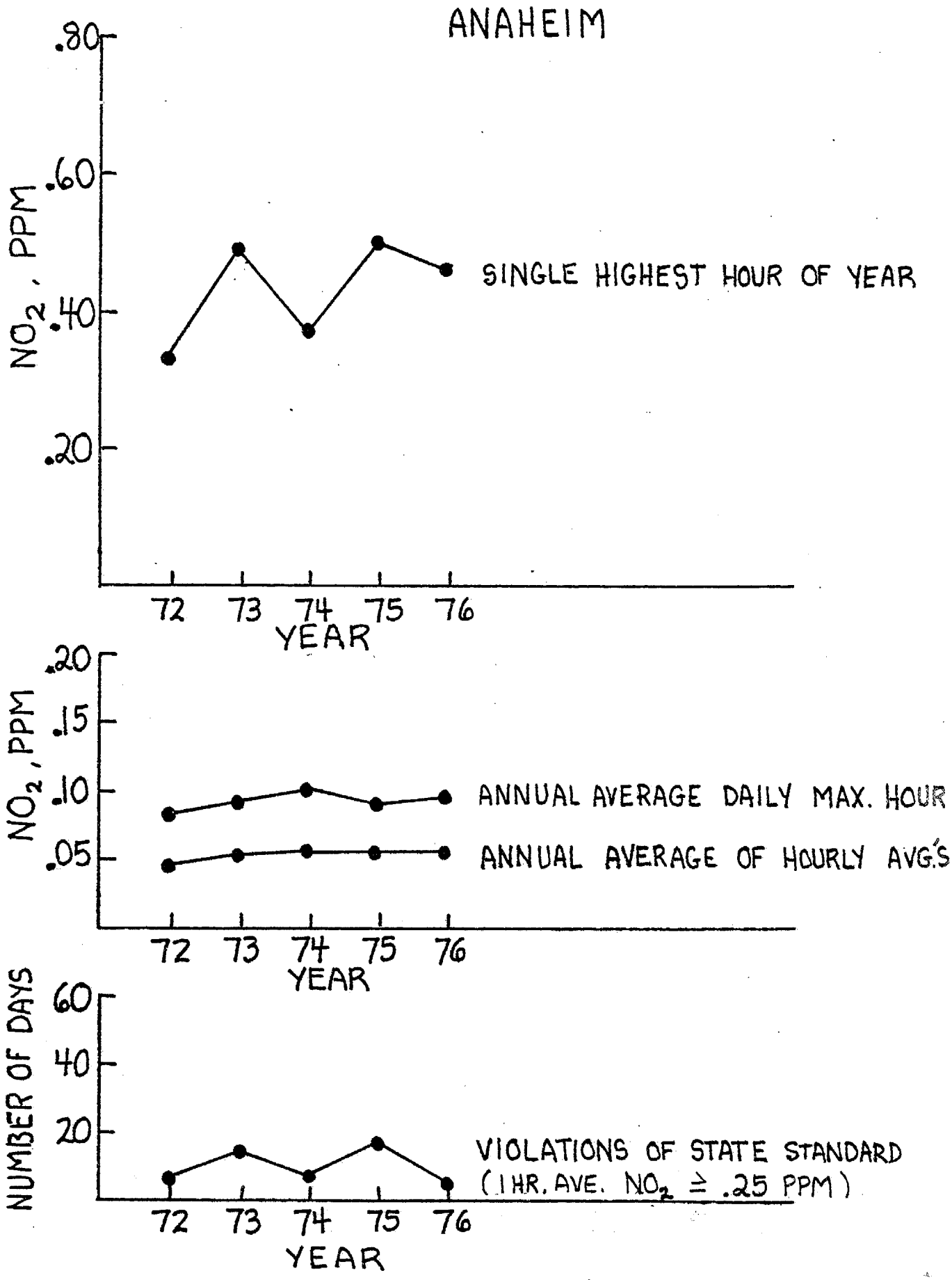


NITROGEN DIOXIDE

WEST LOS ANGELES

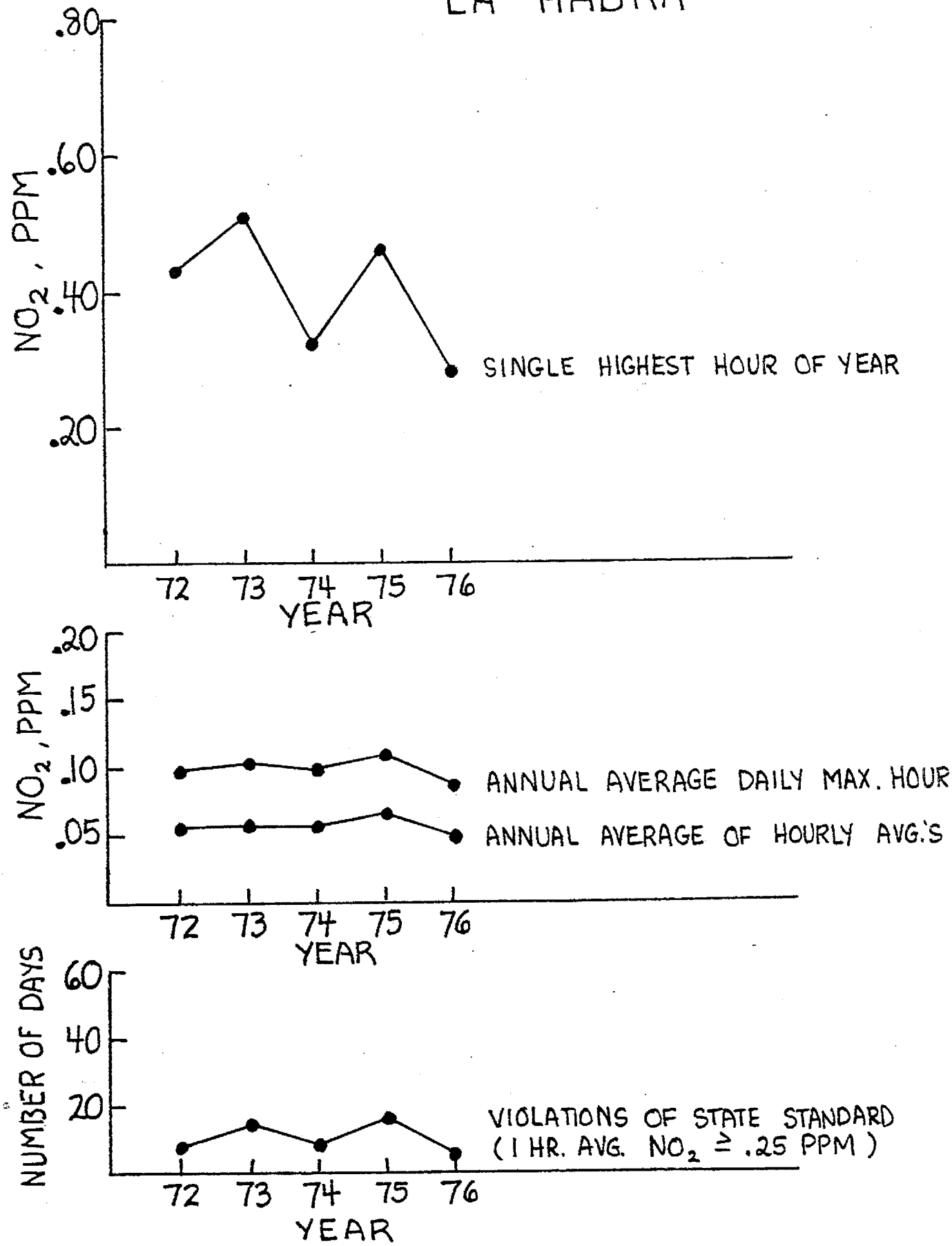


NITROGEN DIOXIDE



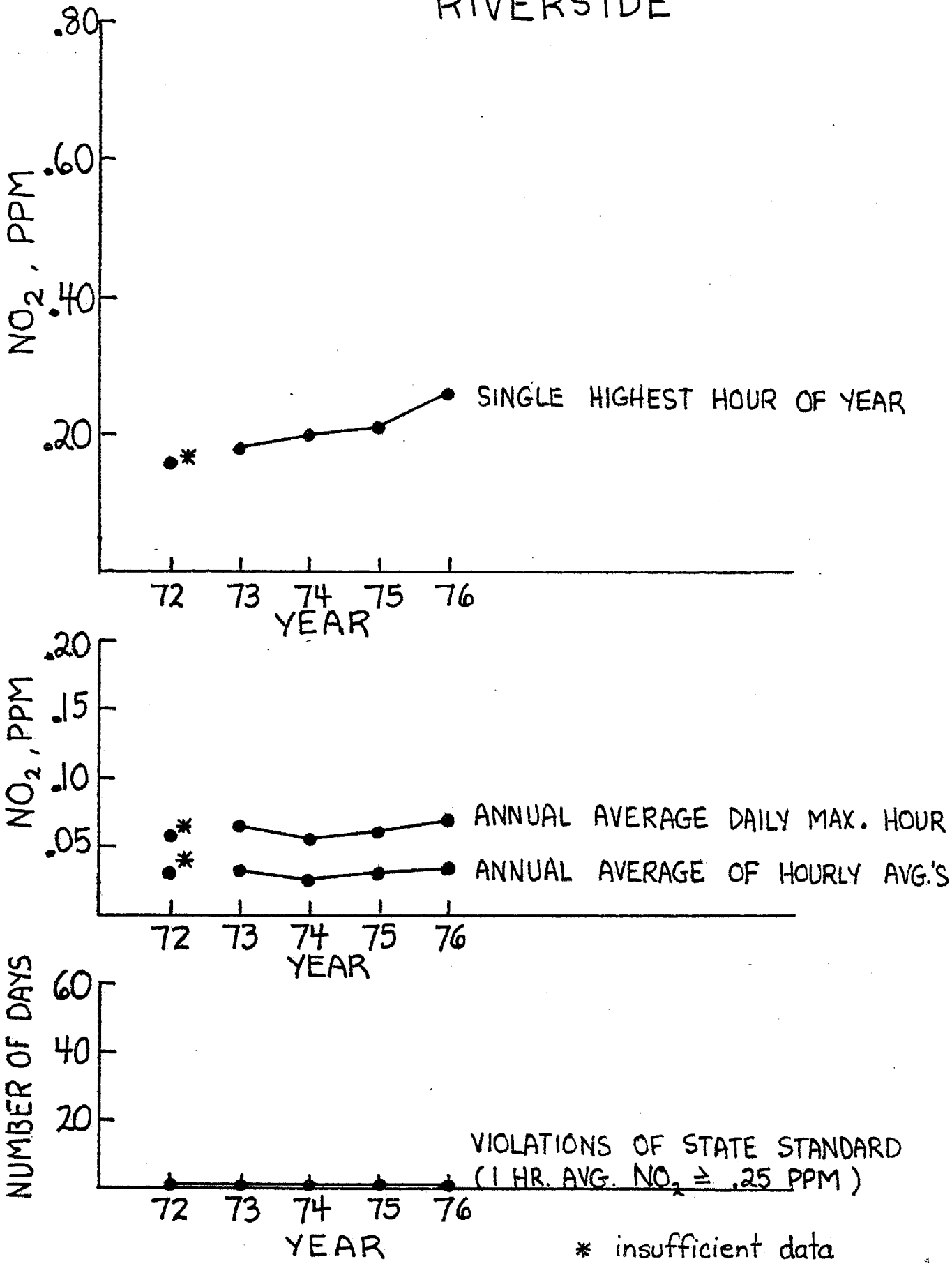
NITROGEN DIOXIDE

LA HABRA

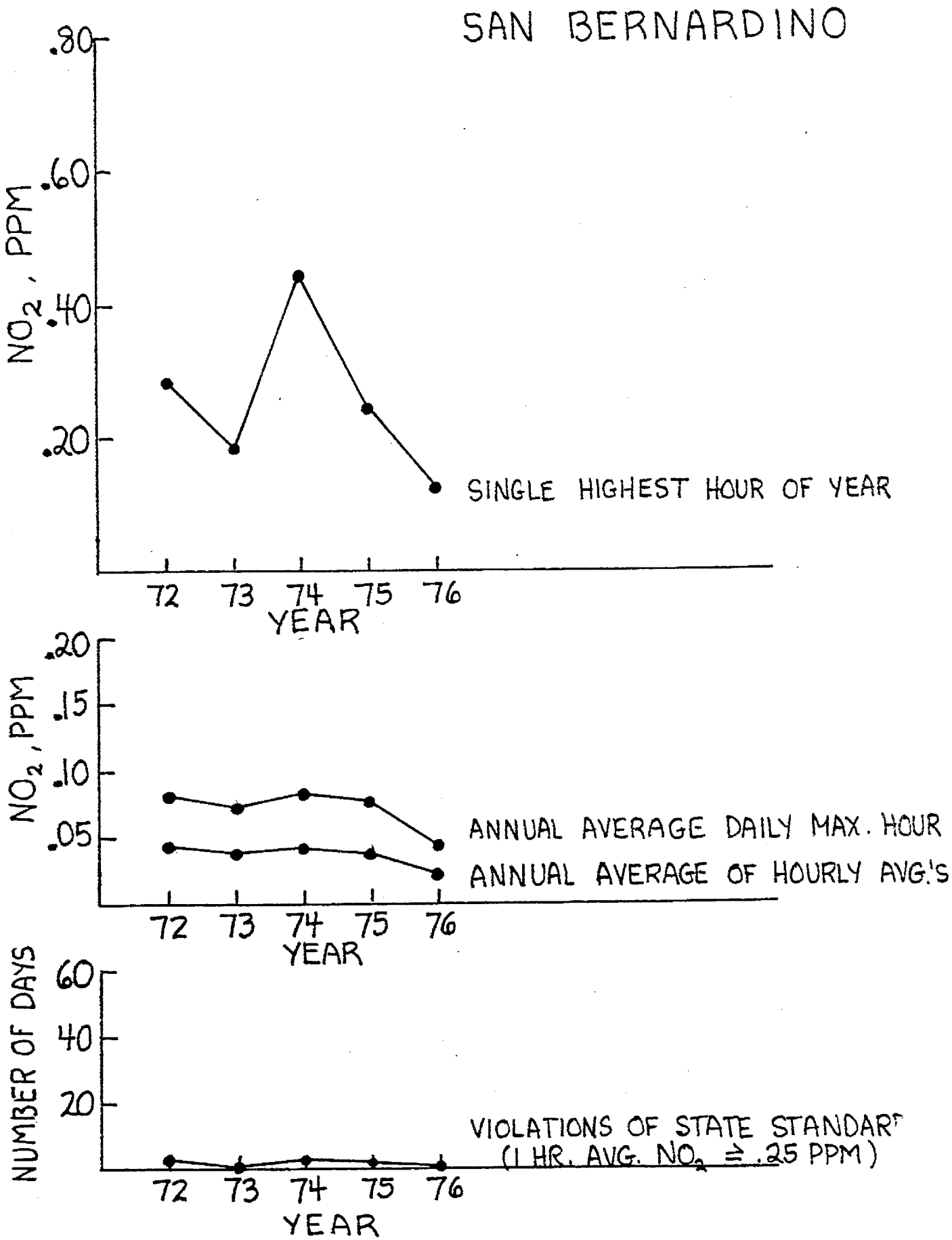


NITROGEN DIOXIDE

RIVERSIDE



NITROGEN DIOXIDE



ANNUAL ARITHMETIC MEAN, PPM

ZONE #	STATION Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	0.075	0.092	0.077	0.066	0.075	0.067	0.073
060	Azusa	0.063	0.062	0.062	0.062	0.063	0.060	0.053
069	Burbank	0.092	0.092	0.079	0.074	0.071	0.074	0.072
071	WLA	0.067	0.075	0.063	0.070	0.071	0.068	0.076
072	L. B.	0.079	0.067	0.070	0.068	0.067	0.062	0.074
074	Reseda	0.069	0.071	0.069	0.063	0.058	0.064	0.055
075	Pomona	0.084	0.078	0.077	0.072	0.069	0.072	0.068
076	Lennox	0.070	0.069	0.064	0.064	0.063	0.056	0.073
080	Whittier	0.066	0.078	0.074	0.065	0.055	0.072	0.073
081	Newhall		0.041	0.041	0.038	0.030	0.032	0.027
082	Lancaster		0.015	0.015	0.014	0.016	0.018	0.014
083	Pasadena				0.072	0.074	0.082	0.078
084	Lynwood					0.055	0.052	0.053
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	0.049	0.052	0.046	0.052	0.056	0.054	0.055
3177	La Habra	0.028	0.053	0.054	0.057	0.056	0.064	0.048
3185	Costa Mesa			0.036	0.031	0.029	0.030	0.027
3186	El Toro				0.031			
3188	San Juan Capistrano							
3189	Laguna					0.022		
3190	Los Alamitos							
3191	Santa Ana Canyon							
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs		0.010	0.015	0.015	0.012		
4139	Indio			0.016	0.018	0.016	0.017	
4140	Prado Park			0.024	0.028	0.028		
4141	Hemet							
4144	Riverside				0.032	0.026	0.030	0.036
4149	Perris							
4150	Banning							
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino		0.050	0.046	0.040	0.044	0.040	0.024
5155	Barstow					0.039	0.020	
5165	Redlands	0.032	0.042	0.040	0.044	0.038	0.039	0.024
5168	Victorville					0.040	0.029	
5173	Chino				0.045	0.034	0.024	
5174	Upland				0.047	0.060	0.018	
5175	Upland (ARB)				0.062	0.049	0.053	
5176	Fontana					0.036	0.041	
5177	Big Bear							
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							

SUMMARY OF ANNUAL AVERAGES OF DAILY

ONE-HOUR NITROGEN DIOXIDE MAXIMA, 1955-1975

Year	Annual[a] Averages of Daily One-Hour Nitrogen Dioxide Maxima, ppm, By Basin and Station												
	Los Angeles Basin, by Station[b]											USCRV Basin	AV Basin
	1	60	69	71	72	74[c]	75[d]	76[e]	80	83	84	81	82
1955													
1956	.137[6]	.105[4]	.140[6]	.177[6]	.116[7]	.144[5]		.142[6]		.115[6]			
1957	.118	.058	.115	.119	.109	.125[6]		.138		.104			
1958	.149	.073	.119	.145	.113			.153[4]		.145			
1959	.148	.096	.139	.135	.113		.070[2]			.133			
1960	.143	.088	.173	.133	.118					.111			
1961	.143	.080	.134	.153	.117					.096			
1962	.141	.103	.119	.118	.123			.135[2]		.103			
1963	.132	.085	.108	.104	.116			.137		.099			
1964	.117	.088	.105	.104	.114			.129		.109			
1965	.148	.079[10]	.128	.138	.109	.091[10]	.111[7]	.128		.108			
1966	.159	.093	.135	.123	.114	.107	.108	.118		.106			
1967	.136	.095	.164	.123	.144	.118	.118	.161		.119			
1968	.132	.093	.191	.146	.164	.118	.135	.144		.122			
1969	.113	.094	.168	.121	.143	.107	.128	.121	.146[5]	.143			
1970	.143	.113	.163	.133	.148	.129	.141	.133	.127	.169		.085[4]	.040[1]
1971	.173	.117	.167	.146	.126	.131	.128	.135	.139	.143		.079	.030
1972	.146	.118	.141	.125	.134	.128	.126	.119	.134	.137		.080	.032
1973	.118	.111	.129	.132	.118	.115	.117	.111	.113	.119	.127[3]	.068	.028
1974	.134	.115	.125	.138	.116	.110	.114	.115	.097	.127	.096	.052	.033
1975	.128	.108	.127	.134	.112	.119	.119	.100	.126	.140	.093	.055	.037
1976	.131	.103	.124	.146	.132	.106	.113	.126	.120	.134	.092	.045	.033

a) Data are for currently operated stations or for their predecessors in the same areas. If less than a full year's data are available, averages are provided for available months. Note that when only partial years of data are involved, the averages will tend to reflect only seasonal and not annual trends.

b) Exponents indicate number of months of data in the year involved. Unless noted otherwise (underlined), the number indicates the last "n" months of a fractional year.

c) Data for Station 74 in 1957 are for the first 6 months.

d) Data for Station 75 in 1959 are for the first 2 months.

e) Data for Station 76 in 1958 are for the first 4 months.

NITROGEN DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $NO_2 \geq 0.25$ PPM)

ZONE STATION #	Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	45	70	44	16	33	30	27
060	Azusa	18	13	15	12	14	9	3
069	Burbank	61	75	27	28	19	24	15
071	WLA	32	54	26	27	35	36	55
072	L. B.	42	33	36	20	21	26	43
074	Reseda	22	24	22	10	8	17	6
075	Pomona	22	17	13	7	7	14	8
076	Lennox	30	34	17	18	14	10	21
080	Whittier	21	40	35	16	9	25	19
081	Newhall		0	4	0	0	0	0
082	Lancaster		0	0	0	0	0	0
083	Pasadena				8	18	35	23
084	Lynwood					7	12	6
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	4	14	6	12	13	11	9
3177	La Habra	0	6	7	14	7	16	4
3185	Costa Mesa			4	6	1	3	8
3186	El Toro				2			
3188	San Juan Capistrano							
3189	Laguna					3		
3190	Los Alamitos							
3191	Santa Ana Canyon							
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs		0	0	0	0		
4139	Indio			0	0	0	0	
4140	Prado Park			0	0	0		
4141	Hemet							
4144	Riverside				0	0	0	1
4149	Perris							
4150	Banning							
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino		3	2	0	2	1	0
5155	Barstow					4	0	
5165	Redlands	1	1	0	0	2	1	1
5168	Victorville					0	4	
5173	Chino				1	2	2	6
5174	Upland				1	7	4	
5175	Upland (ARB)				0	3	3	
5176	Fontana					0	1	2
5177	Big Bear							
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							

NITROGEN DIOXIDE

MONTHLY MEANS OF DAILY MAX. 1-HOUR AVERAGE, PPM

- 1976 -

MONTH	AREA					
	CENTRAL LOS ANGELES	LENNOX	ANAHEIM	LA HABRA	RIVERSIDE	SAN BERNARDINO
JANUARY	0.137	0.179	0.151	0.121	0.076	0.050
FEBRUARY	0.107	0.117	0.084	0.084	0.064	0.050
MARCH	0.104	0.111	0.085	0.084	0.069	0.036
APRIL	0.088	0.091	0.075	0.062	0.061	0.032
MAY	0.095	0.088	0.067	0.060	0.053	0.045
JUNE	0.137	0.112	0.078	0.068	0.071	0.049
JULY	0.103	0.080	0.058	0.068	0.060	0.051
AUGUST	0.157	0.083	0.079	0.063	0.060	0.060
SEPTEMBER	0.116	0.101	0.078	0.070	0.048	0.058
OCTOBER	0.172	0.153	0.128	0.107	0.083	0.055
NOVEMBER	0.186	0.200	0.163	0.139	0.095	0.040
DECEMBER	0.166	0.193	0.090	0.124	0.079	0.041

SCAQMD - E & P Div.
MFB 10/6/77

Table IV.C-IV

DATA SUMMARY - NITROGEN DIOXIDE, ppm

STATION YEAR	ANNUAL MAXIMUM	ANNUAL ARITHMETIC MEAN		NUMBER OF DAYS IN VIOLATION OF STANDARDS
	1-HOUR AVERAGE	HOURLY AVERAGE	DAILY MAXIMUM HOURLY AVERAGE	1-HOUR AVERAGE ≧ 0.25 PPM
LOS ANGELES COUNTY				
LOS ANGELES				
1972	0.39	0.077	0.146	44
1973	0.58	0.066	0.118	16
1974	0.64	0.075	0.134	33
1975	0.56	0.067	0.129	30
1976	0.53	0.073	0.131	27
WEST LOS ANGELES				
1972	0.42	0.063	0.124	26
1973	0.47	0.070	0.130	27
1974	0.76	0.071	0.137	35
1975	0.60	0.068	0.134	36
1976	0.46	0.076	0.146	55
ORANGE COUNTY				
ANAHEIM				
1972	0.33	0.046	0.082	6
1973	0.49	0.052	0.093	12
1974	0.37	0.056	0.100	13
1975	0.50	0.054	0.092	11
1976	0.46	0.055	0.095	9
LA HABRA				
1972	0.43	0.054	0.095	7
1973	0.51	0.057	0.103	14
1974	0.32	0.056	0.099	7
1975	0.46	0.064	0.109	16
1976	0.28	0.048	0.087	4

Table IV.C-V

DATA SUMMARY - NITROGEN DIOXIDE, ppm

STATION YEAR	ANNUAL MAXIMUM	ANNUAL ARITHMETIC MEAN		NUMBER OF DAYS IN VIOLATION OF STANDARDS
	1-HOUR AVERAGE	HOURLY AVERAGE	DAILY MAXIMUM HOURLY AVERAGE	1-HOUR AVERAGE ≧0.25 PPM
RIVERSIDE COUNTY				
RIVERSIDE (RUBIDOUX)				
1972	0.16*	0.030*	0.058*	0
1973	0.18	0.032	0.064	0
1974	0.20	0.026	0.055	0
1975	0.21	0.030	0.061	0
1976	0.26	0.036	0.068	1
SAN BERNARDINO COUNTY				
SAN BERNARDINO				
1972	0.29	0.046	0.084	2
1973	0.19	0.040	0.075	0
1974	0.45	0.044	0.085	2
1975	0.25	0.040	0.080	1
1976	0.13	0.024	0.047	0

* Yearly statistics may not be representative, due to insufficient data.

Table IV.C-V

NITROGEN DIOXIDE - ANNUAL MAXIMUM 1-HOUR, PPM

STATION	- YEAR -																					
	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
LOS ANGELES	-	.62*	.52	1.29 /	.75*	.60	.57	.53	.55	.70	.70	.80	.54	.47	.80	.71	.74	.39	.58	.64	.56	.53
AZUSA	-	-	.20	.26	.47	.33	.30	.42	.36	.21	.30	.31	.32	.34	.35	.43	.37	.44	.32	.45	.37	.31
BURBANK	-	.42*	.81	.60	1.00	1.23 /	.65	.35	.39	.30	.47	.40	.56	.54	.50	.48	.53	.49	.38	.35	.48	.38
WEST LOS ANGELES	-	-	-	-	-	-	-	.63	.41	.40	.53	.47	.50	.47	.48	.52	.60	.42	.47	.76	.60	.46
LONG BEACH	-	-	-	.48	.56	.53	.46 /	.50	.57	.59	.46	.42	.46	.70	.53	.52	.46	.55	.35	.37	.45	.43
RESEDA	-	-	-	-	-	-	-	-	-	-	.33	.35	.44	.46	.35	.39	.38	.42	.37	.30	.33	.30
POMONA	-	-	-	-	-	-	-	-	-	-	.29*	.29	.37	.42	.43	.45	.40	.43	.36	.34	.41	.32
LENNOX	-	-	-	-	-	-	-	-	-	-	.43	.40	.67	.57	.40	.40	.43	.39	.39	.43	.40	.39
WHITTIER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.67*	.39	.53	.62	.48	.40	.62	.52
NEWHALL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22*	.20	.31	.20	.17	.23	.12
LANCASTER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.12*	.13	.10	.08	.10	.12	.11
PASADENA	-	.88*	.33	/ .54*	.45	.31	.31	.39	.33	.36	.34	.33	.37 /	.53*	.53	.83	.55	.43*/	.33	.47	.49	.38
LYNWOOD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.38*	.37	.32	.39
ANAHEIM	-	-	-	-	-	-	-	-	.20	.22	.23	.27	.27	.34	.35	.34	.54	.33	.49	.37	.50	.46
LA HABRA	-	-	-	-	-	-	-	-	-	-	-	-	.25*	.47	.41	.22	.34	.43	.51	.32	.46	.28
COSTA MESA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.33	.29	.30	.35	.34
EL TORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.30	.33*	.41*	-
SAN JUAN CAPISTRANO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAGUNA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.32	.35*	-
LOS ALAMITOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.34 /	-	.50*	.21*	-
SANTA ANA CANYON	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PALM SPRINGS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.04	.10	.09	.07	.05*	-
INDIO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.06*	.14	.10	.09	.09	.09*
PRADO PARK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22	.17	.22	.18*	-
HEMET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RIVERSIDE	-	-	-	-	-	-	-	-	.27*	.56	.49	.25	.31	.22*	-	-	.38 /	.23*/	.33	.25	.35	.30
PERRIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BANNING	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMECULA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIGHORN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAN BERNARDINO	-	-	-	-	-	-	-	-	.14	.06	.11*	.25	.22	.25	.21	.24*	.27	.29	.19	.45	.25	.13
BARSTOW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17*	.45	.23	.30*
REDLANDS	-	-	-	-	-	-	-	-	-	-	-	-	-	.20	.10	.27	.32	.23	.19	.30	.29	.25
VICTORVILLE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.13*	.22	.30	.10*
CHINO	-	-	-	-	-	-	-	-	-	-	-	-	.13*	.10* /	-	-	-	-	.29	.37	.67	.14*
UPLAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.36	.38	.34	-
UPLAND-ARB	-	-	-	-	-	-	-	-	-	-	-	-	.31* /	-	-	-	-	-	.24	.28	.30	.21*
FONTANA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.13*	.24	.26	.15*
BIG BEAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAKE GREGORY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.01*	.06*	-
YUCAIPA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.11*

* Data may not be representative. / Station location change.

Table IV.C- VI