

MAINE STATE LEGISLATURE

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1981 ANNUAL REPORT
ON AIR QUALITY
IN THE STATE OF MAINE

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1. INTRODUCTION

1.1 Purpose and Overview

The purpose of this report is to present the air quality monitoring data generated by and for the Maine Department of Environmental Protection, Bureau of Air Quality Control, and to provide a historical perspective from which the significance of that data can be interpreted. Air Quality monitoring measures the concentrations of various pollutants in the ambient air. The monitoring is in response to State and Federal requirements to determine whether the air we breathe is attaining and maintaining National and State Ambient Air Quality Standards which are designed to protect the health and welfare of the public. Federal Primary Standards are intended to protect public health. Federal Secondary Standards are intended to protect public welfare. The State Standards are at least as strict as Federal Standards and in some cases are more strict. The reasoning behind establishing more stringent standards is that generally air quality in Maine is significantly cleaner than in other areas and should remain cleaner. The current Federal and State Standards are presented in Tables 1-1 and 1-2. Table 1-3 is a summary indicating all the violations of ambient air quality standards in the State by regions. Later on in this report those violations will be listed by the sites at which they occurred.

In the past the majority of data has been collected by the Department of Environmental Protection. Recently, the Department has required industry to establish monitoring programs primarily when there are air quality problems associated with the industry, or when an industry is planning to build or expand causing a potential increase in air emissions. Now and in the future industry will be taking a greater air monitoring role until such time as Standards are met throughout the State.

Data summarized in this report is available for review in the Department headquarters in Augusta and copies can be obtained from that office for a nominal fee.

1.2 Monitoring Sites

Air quality data are developed using two basic methods; 1) the continuous monitoring of gaseous pollutants and; 2) the periodic sampling of particulate and gaseous pollutants. In addition to pollutant monitoring there is also the continuous monitoring of meteorological parameters.

Continuous gaseous monitoring is done at forty-two sites in Maine. Carbon Monoxide is monitored at two of these stations, ozone at six, sulfur dioxide at thirty-four, nitrogen oxides at two, hydrogen sulfide at two and hydrocarbons at one. Periodic gaseous monitoring is done at four sites. Sulfur dioxide is monitored at all four sites. Nitrogen dioxide is monitored at one of the sites.

Particulate sampling is done at eighty-eight sites in Maine. All of these stations monitor total suspended particulates. Two of these sites also collect fine particulate fractions. Also, lead monitoring is done at six stations. Eight of these sites are analyzed for sulfates although not all of them are on a regular basis.

TABLE 1-1

NATIONAL AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>Averaging Time</u>	<u>Concentration</u>
Particulates (TSP)	Annual Geometric Mean:	
	Primary	75 ug/m ³
	Secondary	60 ug/m ³ *
	Twenty-Four Hour:**	
	Primary	260 ug/m ³
	Secondary	150 ug/m ³
Lead (Pb)	Calendar Quarter	1.5 ug/m ³
Carbon Monoxide (CO)	One Hour**	35 ppm
	Eight Hour**	9 ppm
Ozone (O ₃)	One Hour***	0.12 ppm
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.05 ppm
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	0.03 ppm
	Twenty-Four Hour**	0.14 ppm
	Three-Hour** Secondary	0.50 ppm

* = Federal Guideline Only.

** = Not to be exceeded more than once per year.

*** = Statistically estimated number of days with exceedances is not to be more than 1.0 per year.

ppm = Parts of pollutant per million parts of air.

ug/m³ = Micrograms of pollutant per cubic meter of air.

TABLE 1-2

STATE OF MAINE AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>Averaging Time</u>	<u>Concentration</u>
Particulates (TSP)	Annual Geometric Mean	60 ug/m ³
	Twenty-Four Hour	150 ug/m ³
Lead (Pb)	Twenty-Four Hour*	1.5 ug/m ³
Carbon Monoxide (CO)	One Hour*	35 ppm(40 mg/m ³)
	Eight Hour*	9 ppm(10 mg/m ³)
Ozone (O ₃)	One Hour*	.08 ppm(120 ug/m ³)
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	.053 ppm(100 ug/m ³)
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	.022 ppm(57 ug/m ³)
	Twenty-Four Hour	.088 ppm(230 ug/m ³)
	Three Hour	.439 ppm(1150 ug/m ³)
Hydrocarbon	Three Hour*	160 ug/m ³

- * = Not to be exceeded more than once per year.
- PPM = Parts of pollutant per million parts of air.
- ug/m³ = Micrograms of pollutant per cubic meter of air.
- mg/m³ = Milligrams of pollutant per cubic meter of air.

In addition to pollutant monitoring, wind speed and direction is recorded at twenty-five sites around the State. Some of these sites also record other meteorological parameters such as sigma (stability) and temperature, precipitation and solar radiation.

Tables 1-4, 1-5, and 1-6 present all the monitoring sites in Maine and indicate which parameters are monitored at each site. The site numbers in the tables are two characters, a number and a letter. The number represents the Air Quality Control Region in which the site is located and the letter corresponds to the actual monitoring sites within the Regions. The map in Figure 1-1 shows the Air Quality Control Regions within the State and Figures 1-2 through 1-5 show the locations of the sites within the Regions.

1.3 Document Organization

This document is divided by pollutant into chapters. Each chapter contains: 1) a description of the nature and sources of that pollutant, 2) its health and welfare effects, 3) a discussion on the standards (current and proposed) for that pollutant, 4) a discussion of the monitoring methods for that pollutant, 5) a table presenting the 1981 monitored data, 6) in the case of some pollutants, historical tables presenting 1981 data along with data for previous years to show trends, effects of control strategy, or change in emission sources.

1.3.1 Explanation of Data Summary Tables

The Data Summary Tables were designed to facilitate comparing 1981 air quality monitoring data with the standards for each pollutant. Therefore, the data are presented for each averaging time for which standards exist for a pollutant.

An annual average concentration is presented for each pollutant that has a long-term, annual standard (NO₂, SO₂, TSP).

For pollutants that have short-term standards, the highest or the highest and second highest short-term values are presented. Some pollutants are allowed to exceed the standard once during the year so the second highest value would be used to determine whether there was a violation or not.

All of the data collected during 1981 has been presented in the Data Summary Tables. However, in making comparisons of the data, one should be aware that a site with only a few samples will not be a valid indicator of pollutant concentrations in the area.

1.3.2 Explanation of Historical Comparison Tables

The Historical Comparison Tables present air quality data for 1981 and those years prior to 1981 when the same pollutant was monitored at the same site. The purpose of the Tables are to indicate the variations in air quality from year to year. The Tables in some cases represent maximum concentrations for specific time periods and in others the number of days in each year that the standards were violated. There may be data for some sites prior to what is presented in this report. That data has not been entered into the computer and therefore statistical summaries are not available. As more of the past data is entered into the computer, historical comparisons will be of more value in showing variations from year to year.

TABLE 1-3

NUMBER OF AMBIENT AIR QUALITY VIOLATIONS BY REGIONS

<u>POLLUTANT</u>	<u>REGIONS*</u>				<u>TOTALS</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
Total Suspended Particulates					
Annual Geometric Mean**					
State	2	0	2	2	6
Federal	0	0	0	1	1
Twenty-four Hour					
State	7	38	83	34	162
Federal	0	6	9	12	27
Lead					
Twenty-four Hour					
State	0	0	0	0	0
Federal	0	0	0	0	0
Carbon Monoxide					
One Hour	n/a	0	0	n/a	0
Eight Hour	n/a	0	0	n/a	0
Ozone					
One Hour					
State	126	33	22	0	181
Federal	9	2	0	0	11
Nitrogen Dioxide					
Annual Arithmetic Mean	0	0	n/a	n/a	0
Sulfur Dioxide					
Annual Arithmetic Mean					
State	0	0	0	0	0
Federal	0	0	0	0	0
Twenty-four Hour					
State	0	0	12	7	19
Federal	0	0	3	0	3
Three Hour					
State	0	0	0	1	1
Federal	0	0	0	1	1

*Region 5 has not been included because there was no monitoring in this region during 1981.

**Annual Means generated by only a few samples are not included in this summary.

TABLE 1-4

PARTICULATE POLLUTANTS MONITORING SITES

<u>Site</u>	<u>Location</u>	<u>TSP</u>	<u>FP</u>	<u>Pb</u>	<u>SO₄</u>
1-B	Cumberland/Great Chebeague Island	-			
1-D	Freeport/Webster Road	-			
1-E	Portland/Portland High School	-			
1-H	Portland/Seltzer and Rydholm	-			
1-I	Portland/Congress Square	X			
1-J	Portland/Shelter Site	X			
1-K	Portland/Tukey's Bridge	X		X	
1-L	South Portland/SMVTI/Vocational Drive	X			X
1-M	South Portland/Rigby Yard	-			
1-N	Westbrook/SD Warren/NET&T Company	X			
1-Q	Westbrook/Westbrook Police Dept.	X			
1-R	Westbrook/S.D. Warren/Research Bldg.	X			
1-T	Westbrook Hospital/SD Warren	+			
1-U	Westbrook/SD Warren/Park Road	+			
1-V	Westbrook/SD Warren/Warehouse #5	+			
1-Y	Biddeford/Biddeford Post Office	+			
1-Z	Biddeford/Biddeford Treatment Plant	+			
2-B	Auburn/Lepage Bakery/Second Street	X			
2-C	Lewiston/Post Office	X		X	X
2-G	Jay/International Paper Weather	+			
2-H	Jay/International Paper/Crash Road	X			
2-I	Jay/International Paper/Jay Hill	X			
2-J	Jay/IP/Bracketts/Crash Road	+			
2-K	Jay/IP/Water Treatment Plant	+			
2-L	Augusta/Cony High School	X		X	X
2-O	Fairfield/Fairfield Post Office	+			
2-Q	Skowhegan/Hinckley	X			
2-R	Waterville/Al Corey's Music Store	+			
2-U	Thomaston/Martin Marietta/Dexter Ave.	X			
2-V	Thomaston/Sanders Property	X			
2-W	Thomaston/Martin Marietta/Pease Prop.	X			
2-Z	Thomaston/Martin Marietta/Marsh Road	X			
2-CC	Mexico/Mexico Treatment Plant	X			X
2-DD	Mexico/Carter Residence	X			
2-FF	Mexico/Labonville/Route #2	+			
2-GG	Mexico/Mexico Pump House	+			
2-HH	South Paris/Wilner Wood-Bessey Motors	X			
2-II	South Paris/Wilner Wood/Reilly Property	X			
2-KK	Canton/IP/Kennetts Property	+			
2-MM	Rumford/Rumford High School	X			
2-NN	Madison Paper/Madison Municipal Bldg.	+			
2-OO	Madison Paper/Coro Property	+			
2-PP	Skowhegan/Eaton Ridge	X			
2-QQ	Brooks/Route #139/Ryan Property	+			

X = In operation through the year
 + = Started operating during the year.
 - = Discontinued operation during the year.
 0 = Operated during part of the year.

TABLE 1-4

PARTICULATE POLLUTANTS MONITORING SITES (CON'T)

<u>Site</u>	<u>Location</u>	<u>TSP</u>	<u>FP</u>	<u>Pb</u>	<u>SO₄</u>
3-A	Bucksport/St. Regis/Fire Station	+			
3-B	Bangor/Regional Office/31 Central St.	X			X
3-C	Bangor/Kenduskeag Pump Station	X		X	
3-D	Bangor/Bangor Daily News	X			
3-E	Bangor/BIA-Bldg. #487/Air Natn'l Guard	X			
3-F	Brewer/Fire Station/South Main St.	X			
3-G	Brewer/Brewer Junior High School	X			
3-H	East Millinocket/GNP/Aeration Lagoon	X			
3-I	East Millinocket/GNP/Katahdin School	X			
3-J	Lincoln/LP&P/Vocational Ed. Bldg.	X			
3-K	Lincoln/LP&P/Lincoln Post Office	X			
3-L	Lincoln/LP&P/Katahdin Avenue Field	X			
3-O	Millinocket/GNP/Wastewater Treatment Plant	X			
3-P	Millinocket/GNP/York Street	X			X
3-S	Millinocket/GNP/East Avenue	X			
3-T	Old Town/Marsh Island Apartments	X			
3-U	Old Town/Penobscot Shoe Company	X			
3-W	Newburgh/Newburgh School	X			
3-X	Milford/Shumway Field/Diamond Intern'l	X			
3-Y	Winn/Hynes/Route #2/Diamond Intern'l	-			
3-Z	Winn/Homgas/Route #2/Diamond Intern'l	-			
3-BB	Calais/Post Office	-			
3-CC	Calais/Calais Hospital	-			
3-DD	Woodland/Sewage Treatment Plant	-			
3-EE	Baring/Moosehorn Nat'l Wildlife Refuge	-			
3-FF	Woodland/GP/"D" Street	X			
3-HH	Woodland/GP/Secondary Treatment Pipeline	X			
3-II	Woodland/Woodland High School	X	-		
3-JJ	Woodland/Sunrise Trustworthy Hardware	-			
3-KK	Eastport/Eastport Elementary School	-	-		
3-LL	Eastport/Flagg Furniture	-			
3-MM	Campobello Island/Roosevelt Park	-			
3-OO	Woodland/GP/CNS Waferboard Mill	+			
4-A	Aroostook County/Portage Lake	X			
4-B	Aroostook County/T12 R8	X			
4-C	Easton/Patterson Property	+			
4-E	Madawaska/Madawaska High School	X			
4-G	Madawaska/Albert Street	X			
4-I	Presque Isle/Regional Office	X		X	X
4-J	Presque Isle/High School	X			
4-K	Presque Isle/Skyway School	X			
4-L	Presque Isle/Northeastland Hotel	X		X	X
4-M	Presque Isle/Steego Auto Parts	+			
4-N	Presque Isle/Creasey Ridge Road	+			

X = In operation through the year.

+ = Started operating during the year.

- = Discontinued operation during the year.

O = Operated during part of the year.

TABLE 1-5

GASEOUS POLLUTANT MONITORING SITES

<u>Site</u>	<u>Location</u>	<u>CO</u>	<u>O₃</u>	<u>SO₂</u>	<u>NO_x</u>	<u>HC</u>	<u>H₂S</u>
1-A	Cape Elizabeth/Shelter Site		0				
1-B	Cumberland/Great Chebeague Island			-			
1-C	Pownal/Trailer Site		0				
1-D	Freeport/Webster Road			0			
1-E	Portland/Portland High School			-B	-B		
1-F	Portland/Maine National Bank			X			
1-J	Portland/Shelter Site				0	0	
1-P	Westbrook/SD Warren/Stroudwater			-			
1-X	Yarmouth/Spruce Point Road/CMP			-			
2-D	Lewiston/Park Street Parking Lot			-			
2-E	Lewiston/Country Kitchen Parking Lot			+			
2-F	Lewiston/New England Telephone Bldg.			+			
2-H	Jay/International Paper/Crash Road			-			
2-I	Jay/International Paper/Jay Hill	+		+			+
2-J	Jay/IP/Bracketts/Crash Road			+			
2-K	Jay/IP/Water Treatment Plant			+			+
2-P	Gardiner/Gardiner High School		0				
2-Q	Skowhegan/Hinckley			-B			
2-S	Rockland/MC/Rockland Treatment Plant			+			
2-U	Thomaston/Martin Marietta/Dexter Avenue			X			
2-Y	Thomaston/Martin Marietta/Swamp Site			X			
2-Z	Thomaston/Martin Marietta/Marsh Road			X			
2-AA	Thomaston/Martin Marietta/Route #1			X			
2-BB	Thomaston/Martin Marietta/Benner Hill			X			
2-DD	Mexico/Carter Residence			X			
2-EE	Mexico/Riverside Service Station			X			
2-KK	Canton/IP/Kennetts Property			+	+		
2-MM	Rumford/Rumford High School			X			
2-PP	Skowhegan/Eaton Ridge			-B			
3-B	Bangor/Regional Office/31 Central Street	X					
3-I	East Millinocket/GNP/Katahdin School			X			
3-K	Lincoln/Post Office Building			0			
3-N	Millinocket/Millinocket Airport			0			
3-O	Millinocket/GNP/Wastewater Treatment Plant			X			
3-P	Millinocket/GNP/York Street			X			
3-Q	Millinocket/GNP/Westwood Street			X			
3-S	Millinocket/GNP/East Avenue			X			
3-V	Milford/St. Regis Stud Mill		0				
3-W	Newburgh/Newburgh School		0				
3-AA	Bradley/Buchanan Property			+			
3-FF	Woodland/Geomet/"D" Street			-B			
3-HH	Woodland/GP/Secondary Treatment Pipeline			X			

X = In operation through the year.
+ = Started operating during the year.
- = Discontinued operation during the year.
0 = Operated during part of the year.
B = Integrated samples using bubbler box.

TABLE 1-5

GASEOUS POLLUTANT MONITORING SITES (CON'T)

<u>Site</u>	<u>Location</u>	<u>CO</u>	<u>O₃</u>	<u>SO₂</u>	<u>NO_x</u>	<u>HC</u>	<u>H₂S</u>
4-D	Caribou/Caribou Airport		0				
4-E	Madawaska/Madawaska High School			X			
4-G	Madawaska/Albert Street			X			
4-H	Madawaska/Sewage Treatment Plant			X			

X = In operation through the year.
 + = Started operating during the year.
 - = Discontinued operation during the year.
 O = Operated during part of the year.
 B = Integrated samples using bubbler box.

TABLE 1-6

METEOROLOGICAL MONITORING SITES

<u>Site</u>	<u>Location</u>	<u>WS/WD</u>
1-C	Pownal/Trailer Site	0
1-G	Portland/Cheverus High School	X
1-O	Westbrook/Prides Crossing	-
1-S	Westbrook/SD Warren Wind	X
1-W	Yarmouth/Cousins Island Meteorology	X
2-A	Auburn/Lewiston-Auburn Airport	X
2-G	Jay/International Paper Weather	+
2-M	Augusta/Deering Bldg./AMHI	-
2-N	Augusta/State Airport/Governor's Hangar	+
2-S	Rockland/MC/Crocketts Point	+
2-X	Thomaston/Martin Marietta Weather	X
2-JJ	South Paris/Wilner Weather	+
2-KK	Canton/IP/Kennetts Property	+
2-LL	Rumford/Boise-Cascade Weather	X
3-A	Bucksport/Fire Station/St. Regis	+
3-B	Bangor/Regional Office/31 Central Street	-
3-E	Bangor/BIA-Bldg.#487/Air Natn'l Guard	X
3-I	East Millinocket/GNP/Katahdin School	X
3-M	Lincoln/LP&P/Lincoln Town Garage	X
3-R	Millinocket/GNP-Office	X
3-GG	Woodland/GP/Georgia Pacific Mill	X
3-NN	Eastport/Pleasant Street	X
4-F	Madawaska/Fraser Paper Co./Bridge Street	X
4-H	Madawaska/Sewage Treatment Plant	X
4-I	Presque Isle/Regional Office	X

X = In operation through the year.
+ = Started operating during the year.
- = Discontinued operation during the year.
0 = Operated during part of the year.

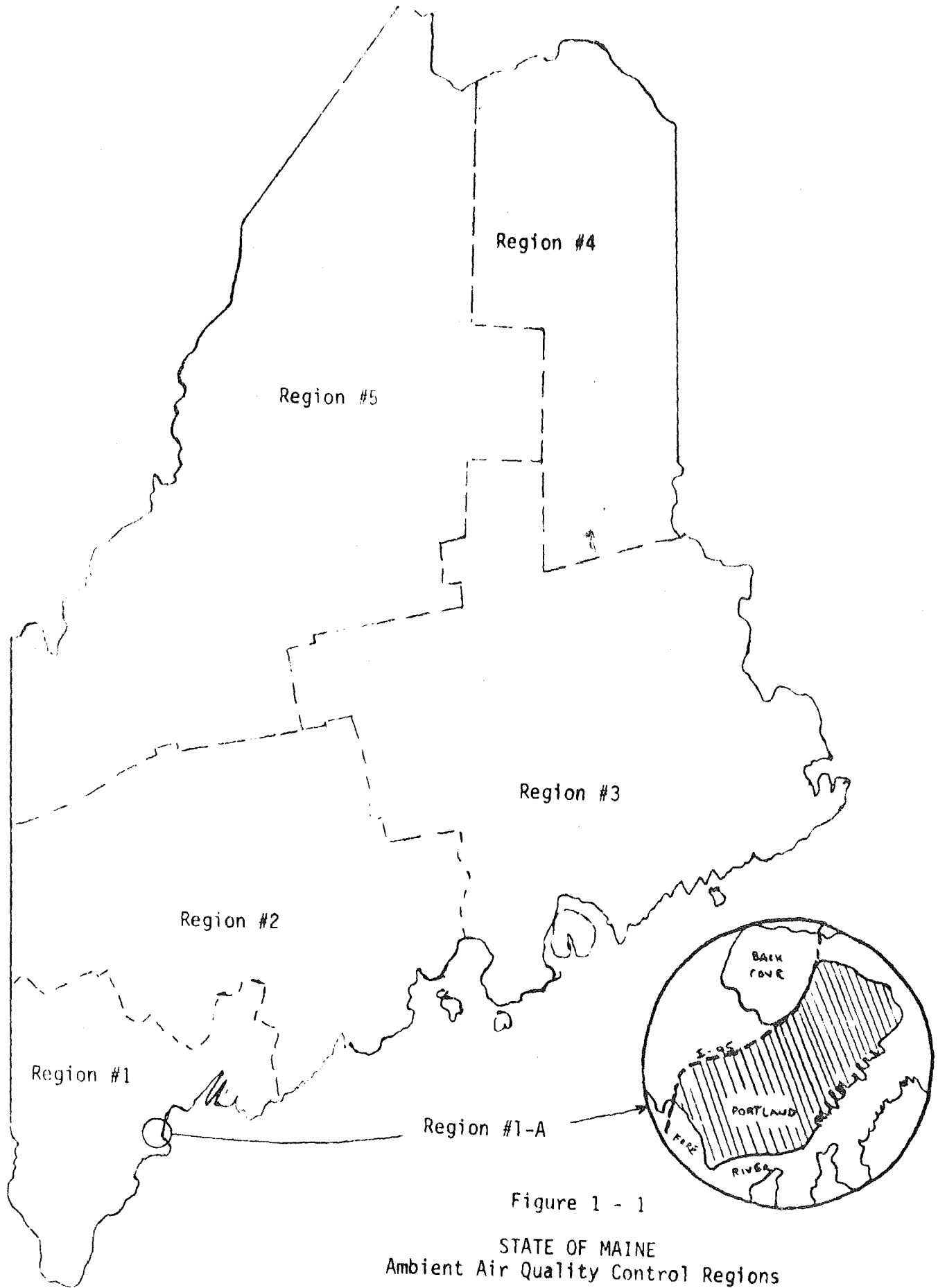


Figure 1 - 1

STATE OF MAINE
Ambient Air Quality Control Regions

FIGURE 1-2
AIR QUALITY MONITORING SITES
IN AIR QUALITY CONTROL REGION #1
AND REGION #1-A

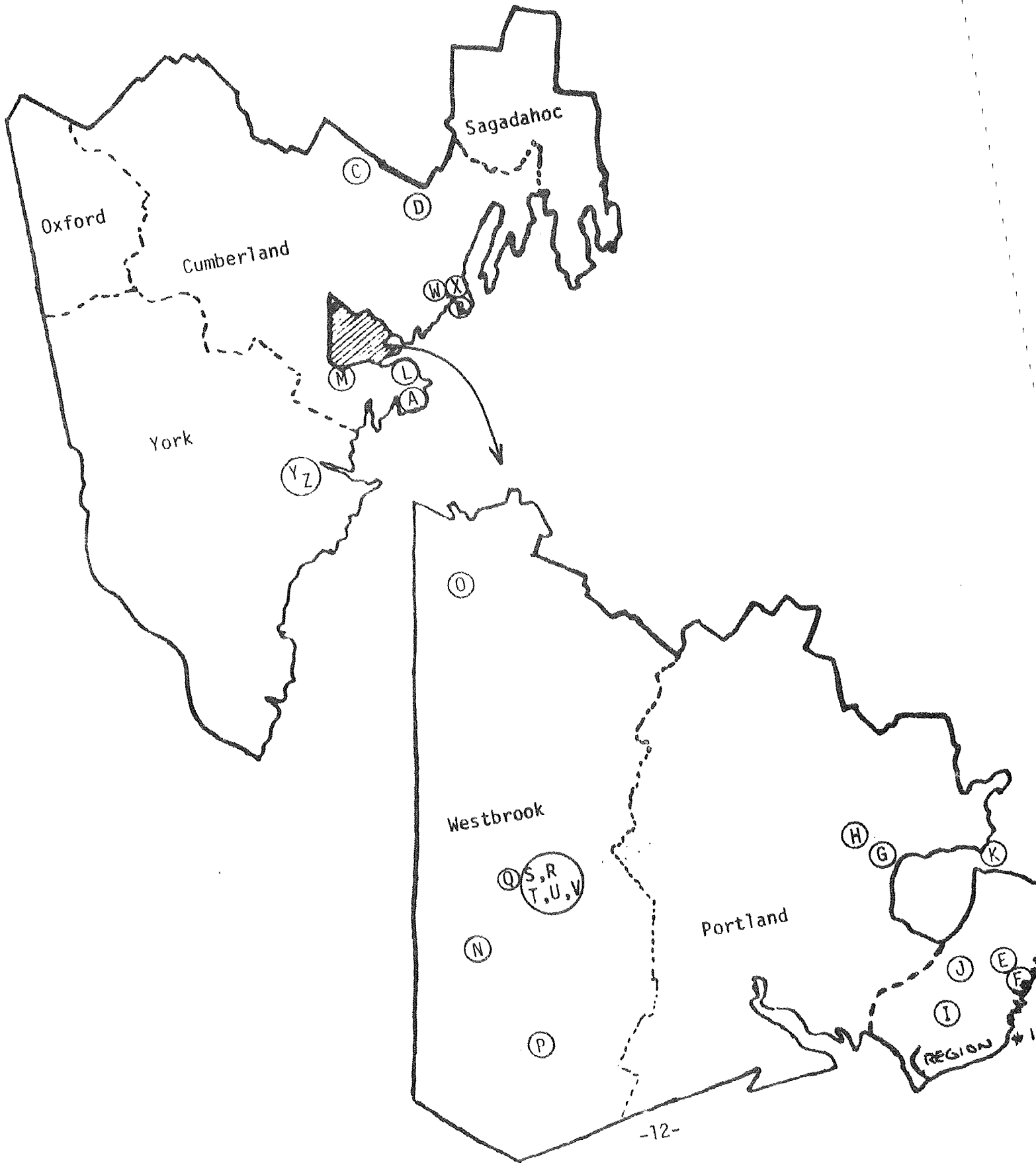


FIGURE 1-3

AIR QUALITY MONITORING SITES
IN AIR QUALITY CONTROL REGION #2

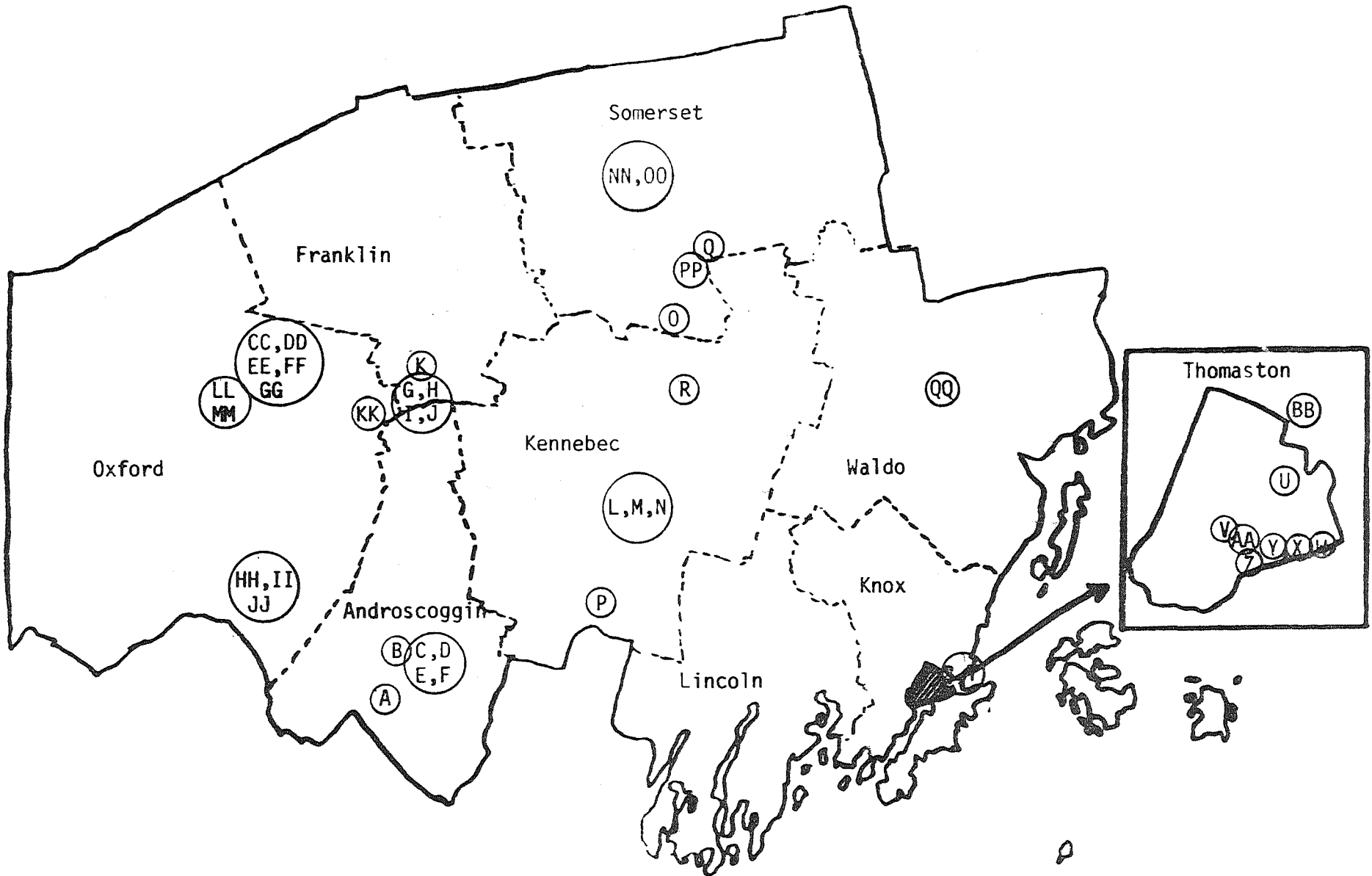


FIGURE 1-4

AIR QUALITY MONITORING SITES
IN AIR QUALITY CONTROL REGION #3

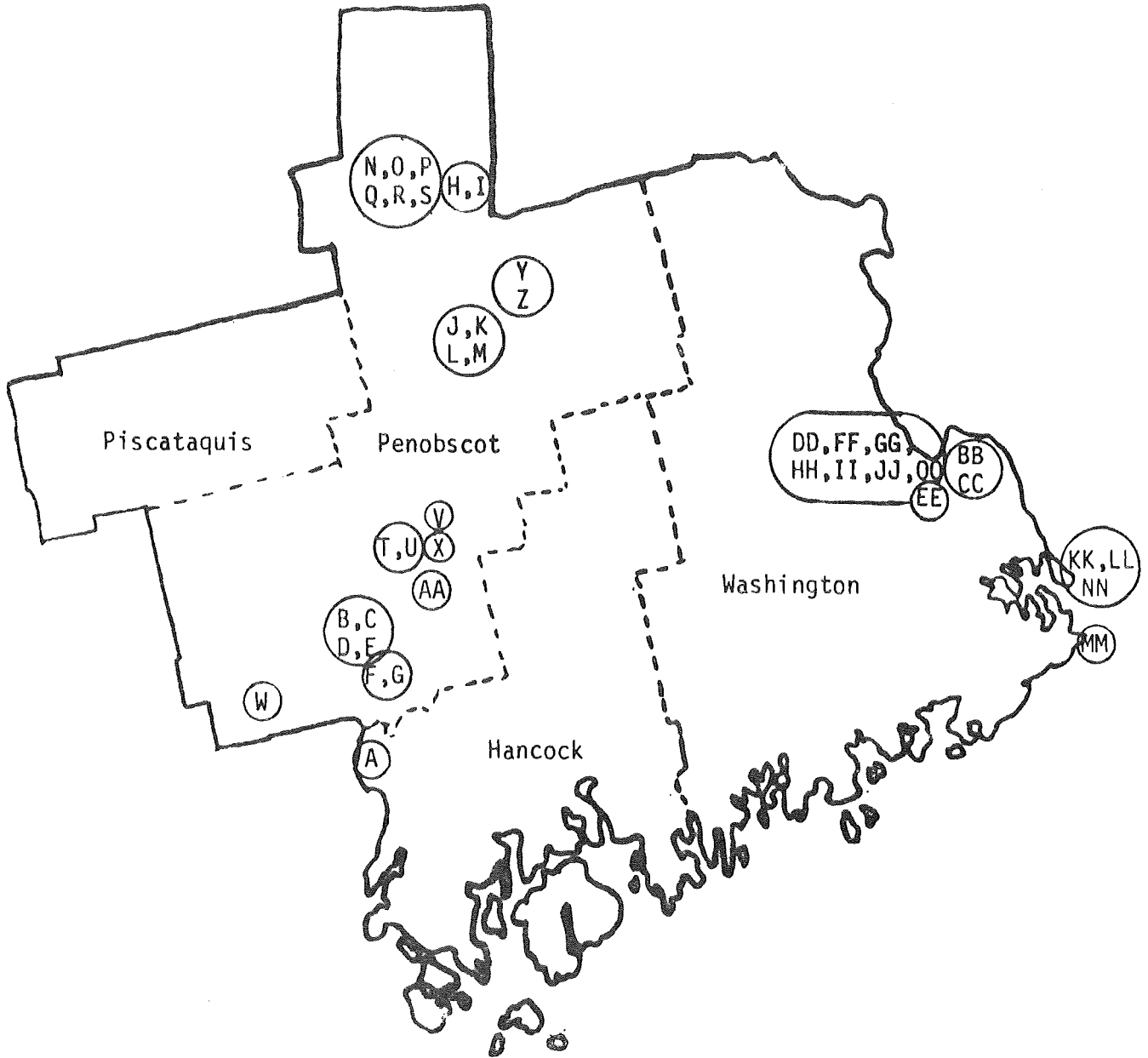
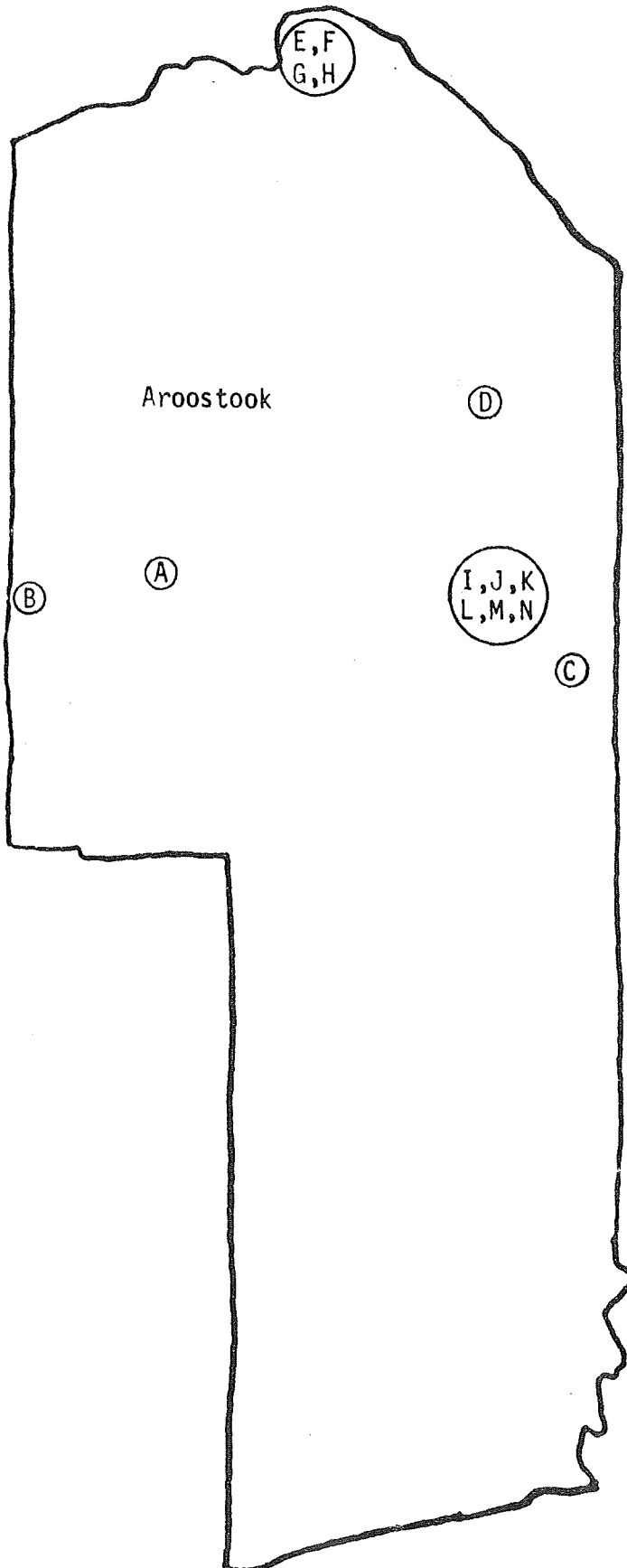


FIGURE 1-5

AIR QUALITY MONITORING SITES
IN AIR QUALITY CONTROL REGION #4



1.3.3 Explanation of Trends Tables

The highest hourly concentration in a year is not the best indicator of long-term air quality trends because it is an erratic value. Therefore, special trend tables are presented for carbon monoxide and ozone. The trend tables present the 10th, 50th, and 90th percentile values to represent the bulk of the air quality data for each year. Percentiles indicate the fraction, or percent, of the value that are below a particular level. For example, if the 90th percentile value for some set of CO observations is 5.0 ppm, it means that 90% of the time the concentrations of CO are less than 5.0 ppm. Conversely, it also means that 10% of the time the concentrations are above 5.0 ppm. Thus the existence or lack of long-term trends in overall air quality for CO and O₃ can be more reliably determined using the Trends Tables, than by looking at just the Historical Comparison Tables.

2. CARBON MONOXIDE (CO)

2.1 Description and Sources

Carbon monoxide is a colorless, odorless and tasteless gas. Therefore you do not even know you are breathing it until you feel its detrimental effects. It constitutes the largest single fraction of the pollutants found in urban atmospheres. It is produced primarily by the incomplete combustion of organic materials used as fuels for transportation and in the heating of buildings; it also results from industrial processes, refuse burning, and agricultural burning. Several natural sources of CO of both biological and nonbiological origin have also been identified, but their contributions to urban atmospheric concentrations are thought to be small. Background levels of CO (resulting from natural and technological sources) found in relatively unpolluted air range from 0.025 to 1.0 ppm. Urban carbon monoxide is produced primarily by motor vehicles.

Because motor vehicle traffic is the major source of CO, daily concentration peaks coincide with morning and evening rush hours. The worst carbon monoxide problems are found where large numbers of slow moving cars congregate. These problems are further aggravated when they occur in a "street canyon" situation. When there are large amounts of slow moving traffic in a street canyon situation, with the wind blowing perpendicular to the street, carbon monoxide can be trapped in the canyon and build up to unhealthy levels. Such has been the case in Bangor.

CO problems are usually worse in winter because: 1) cold weather makes motor vehicles run dirtier and requires more combustion for space heating; and 2) on winter nights a strong inversion layer develops in the atmosphere, that traps pollution near the ground, preventing it from mixing with cleaner air above.

2.2 Health and Welfare Effects

Carbon monoxide affects the central nervous system by depriving the body of the oxygen it needs. Tests of automobile drivers show exposure to carbon monoxide can impair a driver's judgement and ability to respond rapidly in traffic. It can also impair vision and produce headaches.

Carbon monoxide enters the bloodstream by combining with hemoglobin, the substance that carries oxygen to the cells. Hemoglobin that is bound up with CO is called carboxyhemoglobin. This combination occurs 200 times more readily with CO than with oxygen, so the amount of oxygen being distributed throughout the body by the bloodstream is reduced in CO's presence. Blood laden with CO can weaken heart contractions, lowering the volume of blood distributed to various parts of the body. It can also significantly reduce a healthy person's ability to perform manual tasks, such as working, jogging and walking. A life-threatening situation exists in patients with heart disease, who can't compensate for the oxygen loss. The 4.2 million people in the U.S. suffering from angina pectoris (a heart disease characterized by brief spasmodic attacks of chest pain due to insufficient oxygen levels in the heart muscles) are especially susceptible. Carbon monoxide is also harmful to persons who have

lung disease, anemia or cerebral-vascular disease. Others sensitive to carbon monoxide include human fetus, and people exposed to long-term concentrations, such as traffic officers.

People who sit in idling cars over sustained periods risk harmful CO exposure, as do cigarette smokers. Since about two percent of cigarette smoke is carbon monoxide, if you or someone else smokes while driving in heavy traffic, you may both experience the harmful effects of CO from the cigarette smoke and the engine exhaust accumulated in streets. Even three or four hours after you're exposed, half the excess CO still remains in your bloodstream. Because it takes time for CO to build up in the bloodstream, the severity of health effects depends both on the concentration being breathed and the length of time the person is exposed.

2.3 Standards

The existing standards for carbon monoxide are currently set at 9 parts CO per million parts air (ppm), averaged over a period of 8 hours, and 35 ppm averaged over 1 hour, not to be exceeded more than once per year. As a result of a review and revision of the health criteria, EPA proposes to retain the existing primary 8-hour standard at 9 ppm and to lower the primary 1-hour standard to 25 ppm. The change in the 1-hour standard is being proposed because of the more rapid accumulation of blood carboxyhemoglobin in moderately exercising sensitive persons compared to resting individuals. The impact of exercise, which is greater for short-duration exposures, was not considered in the original standard.

2.4 Monitoring

Carbon monoxide was monitored at two sites in Maine during 1981 using continuous monitoring equipment utilizing the non-dispersive infrared technique.

Tables 2-1 and 2-2 are the 1981 Data Summaries for CO. Table 2-1 presents 1-hour concentrations. Table 2-2 presents 8-hour average concentrations. Table 2-3 presents the CO Historical Comparison and Table 2-4 presents the CO trends.

TABLE 2-1

CARBON MONOXIDE

1981 DATA SUMMARY

(1-Hour Concentrations -- Parts Per Million)

<u>SITE</u>	<u>LOCATION</u>	<u>% DATA RECOVERY</u>	<u>HIGHEST CONCENTRATION</u>	<u>SECOND HIGHEST</u>	<u># OF VIOLATIONS</u>
2-I	Jay/Jay Hill	33.5%	3.5	1.3	0
3-B	Bangor/Regional Office/31 Central Street.	89.8%	12.5	9.8	0

TABLE 2-2

CARBON MONOXIDE

1981 DATA SUMMARY

(8-Hour Concentrations -- Parts Per Million)

<u>SITE</u>	<u>LOCATION</u>	<u>% DATA RECOVERY</u>	<u>HIGHEST CONCENTRATION</u>	<u>SECOND HIGHEST</u>	<u># OF VIOLATIONS</u>
2-I	Jay/Jay Hill	33.5%	0.9	0.9	0
3-B	Bangor/Regional Office/31 Central Street	89.8%	8.2	7.2	0

TABLE 2-3

CARBON MONOXIDE

HISTORICAL COMPARISONS
(8-Hour Concentrations)

SITE 3-B

Bangor Regional Office - 31 Central Street

<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>
1974	20.9 PPM	46
1975	14.6 PPM	48
1976	12.9 PPM	25
1977	13.7 PPM	24
1978	11.8 PPM	8
1979	6.2 PPM	0
1980	8.2 PPM	0
1981	7.2 PPM	0

TABLE 2-4

CARBON MONOXIDE

TRENDS
(1-Hour Concentrations)

SITE 3-B

Bangor Regional Office - 31 Central Street

<u>YEAR</u>	<u>PERCENTILES</u>		
	<u>10%</u>	<u>50%</u>	<u>90%</u>
1978	0.0	1.3	5.2
1979	0.0	0.5	3.0
1980	0.0	0.5	3.2
1981	0.0	0.5	2.7

3. OZONE (O₃)

3.1 Description and Sources

Ozone is a highly reactive form of oxygen which, at very high concentrations, is a blue unstable gas that has a characteristic pungent odor most commonly identified around an arcing electric motor, lightning storms, or other electrical discharges. However, at normal ambient concentrations, ozone is colorless and odorless. Ozone is the major component of photochemical "smog", but the haziness and odors of smog are primarily caused by other components.

Natural ground level ozone occurs in low concentrations (less than .05 ppm) due to natural physical and chemical phenomena. Occasionally, unique meteorological conditions can result in natural levels between .05 and .10 ppm.

Ozone is not emitted directly from a source as are other pollutants. It forms as a secondary pollutant. Its precursors are hydrocarbons and nitrogen oxides, which chemically react in sunlight to form ozone. The hydrocarbons are emitted in automobile exhaust, from gasoline and oil storage and transfer, and from industrial use of paint solvents, degreasing agents, cleaning fluids, ink solvents, incompletely burned coal or wood and many other sources. Plants also give off hydrocarbons such as terpenes from pine trees. Nitrogen oxides are emitted by all combustion sources.

The highest ozone levels generally occur during summer afternoons when the high temperatures and strong sunlight promote photochemical reactions. Stagnant weather may cause smog to remain in an area for several days. The winds may also transport ozone many miles outside of the urban environment. For example, it is estimated that one-third of the ozone in the State of Maine is transported into the State from sources located outside the State. In addition one-third of the ozone is naturally occurring background concentrations, part of which is also transported into the State. The remaining one-third is assumed to be due to local sources within the State. Because of long-range transport, local control of emissions by itself may not solve the ozone problem. An effective national program may be necessary to achieve national compliance.

Ground-level ozone, discussed above, should not be confused with the stratospheric ozone layer, located about seven miles high in the atmosphere, which shields the earth from cancer-causing ultraviolet rays. Concentrations of ozone in this layer may reach as high as 10 ppm. Concern over potential reduction of the necessary levels of ozone in the stratosphere by reactions with fluorocarbons from aerosol cans has resulted in the removal of most of these propellants from the market. However, ozone at ground level, where it is breathed, is a pollutant.

3.2 Health and Welfare Effects

Ozone at low concentrations causes eye irritations and at higher concentrations difficulty in breathing for people with respiratory problems, the elderly, and children. Many plants, such as white pine, soybeans and alfalfa, are extremely sensitive to ozone, and O₃ is known to weaken materials such as rubber and fabrics.

3.3 Standards

The existing National Ambient Air Quality Standards (NAAQS) for ozone is 0.12 ppm and will be attained when "the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is equal to or less than one." This standard is new as of February 8, 1979 and replaces a more restrictive 0.08 ppm standard that was established April 10, 1971. The change was the result of a required assessment of existing NAAQS to include a review of new health effects data that have become available since 1970. As a result of this review and national public comments, the standard was changed to a level that is considered to be sufficient to protect the public health and welfare. The current State Standard is .08 ppm. It was established at the same time the original Federal Standard was established and has not been changed.

3.4 Monitoring

Ozone was monitored at six sites in Maine during 1981 using continuous monitoring equipment of two kinds, either chemiluminescence or ultra-violet absorption analyzers. Maine's ozone monitoring season is limited to April through September due to the weather conditions which are not conducive to ozone formation at other times of the year.

Table 3-1 is the 1981 Data Summary for Ozone. Table 3-2 presents the Ozone Historical Comparisons and Table 3-3 presents the Ozone Trends.

TABLE 3-1

OZONE

1981 DATA SUMMARY
(Parts Per Million)

<u>SITE</u>	<u>LOCATION</u>	<u>% DATA RECOVERY*</u>	<u>HIGHEST CONCENTRATION</u>	<u>SECOND HIGHEST</u>	<u># OF VIOLATIONS</u>	
					<u>STATE**</u>	<u>FEDERAL</u>
1-A	Cape Elizabeth/ Shelter Site	44.3%	.142	.138	101	9
1-C	Pownal/Trailer Site	37.5%	.116	.116	25	0
2-P	Gardiner/Gardiner High School	43.7%	.127	.122	33	2
3-V	Milford/St. Regis Stud Mill	39.7%	.105	.105	15	0
3-W	Newburgh/Newburgh School	39.0%	.100	.090	7	0
4-D	Caribou/Caribou Airport	41.8%	.070	.065	0	0

* Maximum data recovery based on ozone monitoring season is 50.0%.
 ** The number of hours of Federal Violations, because they are also State violations, are included in this number.

TABLE 3-2

OZONE

HISTORICAL COMPARISONS
(1-Hour Concentrations)

SITE 1-A			SITE 1-C		
CAPE ELIZABETH <u>Shelter Site</u>			POWNAI <u>Trailer Site</u>		
<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>	<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>
1978	.160 PPM	122	1980	.123 PPM	47
1979	.155 PPM	119	1981	.116 PPM	25
1980	.178 PPM	144			
1981	.122 PPM	101			

SITE 2-P			SITE 3-V		
GARDINER <u>Gardiner High School</u>			MILFORD <u>St. Regis Stud Mill</u>		
<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>	<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>
1980	.143 PPM	54	1979	.120 PPM	17
1981	.122 PPM	33	1980	.095 PPM	15
			1981	.105 PPM	15

SITE 3-W			SITE 4-D		
NEWBURGH <u>Newburgh School</u>			CARIBOU <u>Caribou Airport</u>		
<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>	<u>YEAR</u>	<u>SECOND HIGH</u>	<u># OF VIOLATIONS</u>
1979	.108 PPM	9	1980	.050 PPM	0
1980	.100 PPM	22	1981	.065 PPM	0
1981	.090 PPM	7			

TABLE 3-3

OZONE

TRENDS

(1-Hour Concentrations)

SITE 1-A				SITE 1-C			
CAPE ELIZABETH Shelter Site				POWNAI Trailer Site			
YEAR	PERCENTILES			YEAR	PERCENTILES		
	10%	50%	90%		10%	50%	90%
1978	.015	.035	.065	1980	.004	.025	.052
1979	.018	.036	.070	1981	.003	.023	.049
1980	.019	.035	.065				
1981	.015	.032	.056				

SITE 2-P				SITE 3-V			
GARDINER Gardiner High School				MILFORD St. Regis Stud Mill			
YEAR	PERCENTILES			YEAR	PERCENTILES		
	10%	50%	90%		10%	50%	90%
1980	.008	.031	.056	1979	.010	.025	.045
1981	.009	.029	.050	1980	.010	.030	.045
				1981	.005	.025	.045

SITE 3-W				SITE 4-D			
NEWBURGH Newburgh School				CARIBOU Caribou Airport			
YEAR	PERCENTILES			YEAR	PERCENTILES		
	10%	50%	90%		10%	50%	90%
1979	.010	.025	.045	1980	.000	.010	.025
1980	.010	.030	.048	1981	.000	.015	.030
1981	.000	.020	.045				

4. NITROGEN DIOXIDE (NO₂)

4.1 Description and Sources

In its pure state, nitrogen dioxide is a reddish-orange-brown gas with a characteristic pungent odor. It is corrosive and a strong oxidizing agent. Nitrogen dioxide comprises about 10% of the oxides of nitrogen (NO_x) that are formed when nitrogen in the air combines with oxygen during high temperature combustion. Most of the rest of the NO_x emitted by combustion sources is nitric oxide (NO). However, during the day most of the NO is photochemically transformed into NO₂. Thus, essentially all the NO_x emitted can be assumed to eventually become NO₂.

4.2 Health and Welfare Effects

Exposure to NO₂ affects the delicate structure of lung tissue. High levels cause lung irritation and potential lung damage. Lower levels have been associated with increased respiratory disease. Oxides of nitrogen can cause serious injury to vegetation, including bleaching or death of plant tissue, loss of leaves, and reduced growth rate. NO_x also deteriorates fabrics and fades fabric dyes. Nitrate salts formed from nitrogen oxides have been associated with the corrosion of metals. Nitrogen oxides can also reduce visibility.

4.3 Standards

The current standard for NO₂ is an annual arithmetic mean (average) value not to exceed .05 ppm. NO₂ is the only gaseous pollutant for which only a long-term (annual average) standard has been established.

4.4 Monitoring

Nitrogen Dioxide was monitored at three sites in Maine during 1981 using continuous monitoring equipment and integrated samplers. Only one site used a bubbler box to collect data during 1981 and it was shut down during the year.

Table 4-1 is the 1981 Data Summary for NO₂. Table 4-2 presents the NO₂ Historical Comparison.

TABLE 4-1
NITROGEN DIOXIDE
1981 DATA SUMMARY
(Parts Per Million)

<u>SITE</u>	<u>LOCATION</u>	<u>% DATA RECOVERY</u>	<u>ANNUAL AVERAGE</u>
1-E	Portland/Portland High School	1.4	.024
1-J	Portland/Shelter Site	68.0	.029
2-KK	Canton/IP/Kennetts Property	32.6	.004

TABLE 4-2
NITROGEN DIOXIDE
HISTORICAL COMPARISONS
(Annual Concentrations in PPM)

<u>SITE</u>	<u>LOCATION</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
1-E	Portland/Portland High School	.025	.021	.022	.019	.024
1-J	Portland/Shelter Site	--	--	--	.013	.029

5. SULFUR DIOXIDE (SO₂)

5.1 Description and Sources

Sulfur dioxide is a colorless irritating gas having the same pungent odor as a struck match. Most people can detect its taste at a level of about 0.3 to 1 part per million. SO₂ is highly soluble in water, forming sulfurous acid. On a worldwide basis, SO₂ is considered to be one of the major pollution problems. It is emitted mainly from stationary sources that utilize fossil fuels (coal, oil) such as power plants, ore smelters, and refineries.

5.2 Health and Welfare Effects

The health effects of sulfur dioxide appear to be always associated with high levels of particulates or other pollutants. The world's major recorded air pollution disasters have been associated with high levels of sulfur dioxide and particulates. The excess deaths attributed to these pollutants were due to respiratory failures and occurred predominantly, but not exclusively, in the elderly and infirm. Atmospheres containing high levels of sulfur dioxide are associated with elevated concentrations of other sulfur compounds such as sulfates and sulfuric acid mists, which are corrosive and potentially carcinogenic.

The corrosiveness of SO₂ and its derivatives also causes crop and material damage. Its transport and transformation into sulfurous and sulfuric acids contribute to acid precipitation, causing soils and lakes to become seriously acidified.

5.3 Standards

There are two existing Primary National Ambient Air Quality Standards for sulfur dioxide. The first is a long-term one year arithmetic average of 0.03 parts per million (ppm). The second is a short-term 24-hour average standard where concentrations are not to exceed 0.14 ppm more than once per year. The current Secondary NAAQS for SO₂ is a 3-hour average concentration of 0.5 ppm not to be exceeded more than once per year.

In addition there are three state standards for sulfur dioxide. The first is a long-term one-year arithmetic average of .022 parts per million. The second is a short-term 24-hour average standard of .088 ppm not to be exceeded. The third is a short-term 3-hour average concentration of .439 ppm not to be exceeded.

5.4 Monitoring

Sulfur dioxide was monitored at 34 sites in Maine during 1981 using continuous monitoring equipment utilizing either the pulsed fluorescent or coulometric methods. In addition, monitoring was done at four sites with bubbler boxes utilizing the Pararosaniline method.

Table 5-1 is the 1981 Data Summary for SO₂. Tables 5-2 and 5-3 present the SO₂ Historical Comparison Data.

TABLE 5-1

SULFUR DIOXIDE

1981 DATA SUMMARY
(Parts Per Million)

<u>SITE</u>	<u>LOCATION</u>	<u>% DATA RECOVERY</u>	<u>MAX 3-HR</u>	<u>MAX 24-HR</u>	<u>ANNUAL AVERAGE</u>
1-B	Cumberland/Great Chebeague Island	21.3%	.040	.021	.004
1-D	Freeport/Webster Road	41.2%	.042	.011	.002
1-E	Portland/Portland High School	1.4%	---	.053	.031
1-F	Portland/Maine National Bank	91.6%	.117	.058	.013
1-P	Westbrook/SD Warren/Stroudwater	61.1%	.051	.027	.004
1-X	Yarmouth/Spruce Point Rd./CMP	83.5%	.070	.029	.002
2-D	Lewiston/Park Street Parking Lot	39.4%	.196	.080	.017
2-E	Lewiston/Country Kitchen Parking Lot	44.1%	.066	.035	.009
2-F	Lewiston/New England Telephone Building	11.2%	.084	.043	.019
2-H	Jay/IP/Crash Road	34.9%	.042	.014	.004
2-I	Jay/IP/Jay Hill	64.3%	.047	.021	.004
2-J	Jay/IP/Bracketts Crash Road	39.6%	.060	.024	.006
2-K	Jay/IP/Water Treatment Plant	38.9%	.081	.015	.004
2-Q	Skowhegan/Hinckley	21.6%	---	.008	.001
2-S	Rockland/MC/Rockland Treatment Plant	72.8%	.156	.033	.005
2-U	Thomaston/Martin Marietta/Dexter Avenue	91.1%	.085	.026	.003
2-Y	Thomaston/Martin Marietta/Swamp Site	42.1%	.061	.022	.002
2-Z	Thomaston/Martin Marietta/Marsh Road	72.2%	.032	.010	.002
2-AA	Thomaston/Martin Marietta/Route #1	57.4%	.019	.011	.002
2-BB	Thomaston/Martin Marietta/Benner Hill	88.6%	.026	.013	.002
2-DD	Mexico/Carter Residence	91.7%	.128	.028	.004
2-EE	Mexico/Riverside Service Station	94.0%	.133	.080	.012
2-KK	Canton/IP/Kennetts Property	35.9%	.140	.031	.006
2-MM	Rumford/Rumford High School	94.7%	.145	.034	.006
2-PP	Skowhegan/Eaton Ridge	21.4%	---	.013	.001
3-I	East Millinocket/GNP/Katahdin School	98.8%	.154	.077	.006
3-K	Lincoln/Post Office Building	81.6%	.317	.226	.011
3-N	Millinocket/Millinocket Airport	18.5%	.062	.025	.006
3-O	Millinocket/GNP/Wastewater Treatment Plant	97.5%	.195	.084	.013
3-P	Millinocket/GNP/York Street	97.9%	.216	.092	.009
3-Q	Millinocket/GNP/Westwood Street	97.5%	.083	.052	.003
3-S	Millinocket/GNP/East Avenue	97.6%	.091	.044	.005
3-AA	Bradley/Buchanan Property	0.4%	.008	.004	.003
3-FF	Woodland/Geomet/"D" Street	21.6%	---	.012	.004
3-HH	Woodland/GP/Secondary Treatment Pipeline	26.9%	.211	.103	.007
4-E	Madawaska/High School	94.0%	.252	.125	.003
4-G	Madawaska/Albert Street	95.7%	.552	.135	.018
4-H	Madawaska/Sewage Treatment Plant	94.0%	.307	.085	.003

TABLE 5-2

SULFUR DIOXIDEHISTORICAL COMPARISONS-MAXIMUM 24-HOUR CONCENTRATIONS

SITE	LOCATION	MAXIMUM 24-HOUR CONCENTRATIONS			
		1978	1979	1980	1981
1-B	Cumberland/Great Chebeague Island	----	----	.028	.021
1-D	Freeport/Webster Road	----	----	.013	.011
1-E	Portland/Portland High School	.051	.055	.055	.053
1-F	Portland/Maine National Bank	.065	.081	.068	.058
1-P	Westbrook/SD Warren/Stroudwater	----	.022	.024	.027
2-D	Lewiston/Park Street Parking Lot	----	----	.083	.080
2-H	Jay/IP/Crash Road	----	----	.016	.014
2-Q	Skowhegan/Hinckley	.035	.019	.011	.008
2-U	Thomaston/Martin Marietta/Dexter Ave.	----	----	.017	.026
2-Y	Thomaston/Martin Marietta/Swamp Site	----	----	.012	.022
2-Z	Thomaston/Martin Marietta/Marsh Road	----	----	.017	.010
2-AA	Thomaston/Martin Marietta/Route #1	----	----	.011	.011
2-BB	Thomaston/Martin Marietta/Benner Hill	----	----	.021	.013
2-DD	Mexico/Carter Residence	----	----	.034	.028
2-EE	Mexico/Riverside Service Station	----	----	.056	.080
2-MM	Rumford/Rumford High School	----	----	.034	.034
2-PP	Skowhegan/Eaton Ridge	.029	.022	.050	.013
3-I	East Millinocket/GNP/Katahdin School	----	----	.118	.077
3-O	Millinocket/GNP/Waste Treatment Plant	.211	.207	.264	.084
3-P	Millinocket/GNP/York Street	.341	.303	.149	.092
3-Q	Millinocket/GNP/Westwood St.	.050	.048	.076	.052
3-S	Millinocket/GNP/East Avenue	----	.156	.114	.044
3-FF	Woodland/Geomet/"D" Street	----	----	.073	.012
3-HH	Woodland/GP/Secondary Treatment Pipeline	----	----	.037	.103
4-E	Madawaska/Madawaska High School	.042	.124	.062	.125
4-G	Madawaska/Albert Street	----	.174	.132	.135
4-H	Madawaska/Sewage Treatment Plant	----	.108	.073	.085

TABLE 5-3

SULFUR DIOXIDE

HISTORICAL COMPARISONS-SITES WITH VIOLATIONS

<u>SITE</u>	<u>LOCATION</u>	<u>TOTAL NUMBER OF VIOLATIONS*</u>			
		<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
3-O	Millinocket/GNP/Waste Treatment Plant	48	32	31	0
3-P	Millinocket/GNP/York Street	37	22	14	1
3-S	Millinocket/GNP/East Avenue	--	2	1	0
3-HH	Woodland/GP/Secondary Treatment Pipeline	--	--	0	1
4-E	Madawaska/Madawaska High School	0	1	0	1
4-G	Madawaska/Albert Street	--	5	10	7
4-H	Madawaska/Sewage Treatment Plant	--	2	0	0

*Includes 3-Hour and 24-Hour Violations.

6. PARTICULATES (TSP)

6.1 Description and Sources

Particulates is the term given to the tiny particles of solid or semi-solid material found in the atmosphere. It is this "dirt" in the air that is visible as a "Brown Cloud", haze or smog. The sources of particulates are many: wind-blown dust and sand from roadways, fields, and construction; coal dust, fly ash, and carbon black from various combustion sources; and automobile exhaust, to name a few. Particulates that range in size from less than 0.1 micrometer to hundreds of micrometers are called "total suspended particulates". Particles larger than that range tend to settle out of the air and not remain suspended, except in high winds.

6.2 Health and Welfare Effects

The human nose filters out 99 percent of the large and medium-sized particles. The rest enter the windpipe and lungs, where some, known as inhalable particulates, cling to protective mucous and are removed. Some of the smallest, called respirable particulates, are deposited in the lungs' tiny air sacs (alveoli).

In the lungs particulates slow down the exchange of oxygen with carbon dioxide in the blood, causing shortness of breath. The heart may be strained because it must work harder to compensate for oxygen loss. Usually the people most sensitive to these conditions have respiratory diseases like emphysema, bronchitis, asthma, or heart problems. The elderly and children are also sensitive.

Particles themselves may be poisonous if inhaled or absorbed, damaging remote organs like the kidneys or liver. Swallowed mucous that is laden with poisonous particulate matter may damage the stomach.

In addition, particulates may be carriers of poisonous liquid or gaseous substances. Sulfur dioxide, a major air pollutant in its own right, is frequently absorbed by particulates and can react with them to form sulfates. Sulfates react with moisture in the air or in the respiratory tract to form corrosive liquid (sulfuric acid) that irritates delicate membranes and slows down the cleansing action of mucous. This effect can reduce the body's ability to remove harmful bacteria, increasing the possibility of infection.

Adverse health effects from particulate matter aren't always seen immediately. Particulates can accumulate in the lungs after repeated, long-term exposure, causing respiratory distress and other health problems that may be manifested later.

Particles in the air block out and scatter sunlight, reducing visibility. Particulates soil and corrode metals, masonry, and textiles. Irritating odors are often associated with particulates, also.

6.3 Standards

Primary:

The current primary particulate standards are for total suspended particulates (TSP), independent of particle size or chemical composition. The long-term standard is an annual geometric mean not to exceed 75 micrograms of particulates per cubic meter of air ($\mu\text{g}/\text{m}^3$). The short-term standard is a 24-hour average of $260 \mu\text{g}/\text{m}^3$ not to be exceeded more than once per year.

EPA is considering revising the particulate standards to account for the deeper inhalability of smaller particles. The new standards, rather than applying to TSP, would apply to inhalable particulates (IP). A particle size of 10 or 15 micrometers is being considered as the upper size limit.

Secondary:

The current secondary TSP standard is a 24-hour average of $150 \mu\text{g}/\text{m}^3$ not to be exceeded more than once per year, designed to protect from soiling, corrosion, etc.

EPA is also considering a small-particle secondary standard designed to protect visibility.

State Standards:

The current State Standards include an annual geometric mean of 60 micrograms per cubic meter and a 24-hour standard of 150 micrograms per cubic meter not to be exceeded.

6.4 Monitoring

Particulates were monitored at 88 sites in Maine during 1981 using High-Volume Particulate Air Samplers (Hi-Vols).

Hi-Vols operate on the same principle as a vacuum cleaner in that the air is drawn through a filter to "catch the dust". The difference is that a Hi-Vol draws a calibrated volume of air through a pre-weighed filter pad (rather than a bag) for a twenty-four hour period. The change in weight of the filter pad is recorded as total suspended particulate or TSP in micrograms of particulates per cubic meter of air.

Certain samplers, called Dichotomous Samplers, are designed to collect particles smaller than either 15 or 10 microns in two different size classes. Size selective particulate data are collected from two sites in the State (see Table 1-4), however, insufficient data are available for inclusion in this report.

TABLE 6-1

TOTAL SUSPENDED PARTICULATES (TSP)

1981 DATA SUMMARY
(Micrograms Per Cubic Meter)

<u>SITE</u>	<u>LOCATION</u>	<u>DAYS SAMPLED</u>	<u>HIGHEST 24-HOUR</u>	<u>SECOND HIGHEST 24-HOUR</u>	<u>ANNUAL GEOMETRIC MEAN</u>
1-B	Cumberland/Great Chebeague Island	69	56	47	20.7
1-D	Freeport/Webster Road	112	55	49	22.9
1-E	Portland/Portland High School	5	115	89	70.1
1-H	Portland/Seltzer and Rydholm	10	103	87	52.5
1-I	Portland/Congress Square	112	102	97	48.2
1-J	Portland/Shelter Site	116	141	129	50.4
1-K	Portland/Tukey's Bridge	96	197	180	62.9
1-L	South Portland/SMVTI/Vocational Drive	113	84	80	37.2
1-M	South Portland/Rigby Yard	35	234	192	55.9
1-N	Westbrook/S.D. Warren/N.E.T.&T. Company	353	159	125	38.8
1-Q	Westbrook/Westbrook Police Department	112	133	132	60.3
1-R	Westbrook/S.D. Warren/Research Bldg.	350	149	148	52.0
1-T	Westbrook/S.D. Warren/Hospital	250	103	95	31.2
1-U	Westbrook/S.D. Warren/Park Road	176	132	101	33.3
1-V	Westbrook/S.D. Warren/Warehouse #5	5	127	75	68.4
1-Y	Biddeford/Biddeford Post Office	4	54	43	41.7
1-Z	Biddeford/Biddeford Treatment Plant	5	65	57	47.2
2-B	Auburn/Lepage Bakery/Second Street	117	148	131	53.5
2-C	Lewiston/Lewiston Post Office	118	184	152	53.1
2-G	Jay/International Paper Weather	93	304	124	33.3
2-H	Jay/IP/Crash Road	249	332	131	23.2
2-I	Jay/IP/Jay Hill	265	437	131	27.5
2-J	Jay/IP/Bracketts/Crash Road	114	75	67	17.1
2-K	Jay/IP/Water Treatment Plant	125	445	308	46.8
2-L	Augusta/Cony High School	117	254	226	59.5
2-O	Fairfield/Fairfield Post Office	128	191	164	59.9
2-Q	Skowhegan/Hinckley	232	71	65	16.1
2-R	Waterville/Al Corey's Music Store	132	204	156	49.6
2-U	Thomaston/Martin Marietta/Dexter Avenue	204	153	137	25.7
2-V	Thomaston/Martin Marietta/Sanders Property	203	104	102	24.5
2-W	Thomaston/Martin Marietta/Pease Property	190	134	119	37.8
2-Z	Thomaston/Martin Marietta/Marsh Road	203	155	143	30.8
2-CC	Mexico/Mexico Treatment Plant	262	130	127	42.0
2-DD	Mexico/Carter Residence	259	119	118	26.8
2-FF	Mexico/Labonvilles/Route #2	231	169	128	48.3
2-GG	Mexico/Mexico Pump House	245	121	117	37.5
2-HH	South Paris/Wilner Wood/Bessey Motors	106	141	120	52.6
2-II	South Paris/Wilner Wood/Reilly Property	104	152	129	58.7
2-KK	Canton/IP/Kennetts Property	116	62	42	14.6
2-MM	Rumford/Rumford High School	257	93	90	28.9
2-NN	Madison Paper/Madison Municipal Building	28	131	107	39.7
2-OO	Madison Paper/Coro Property	26	80	76	32.1
2-PP	Skowhegan/Eaton Ridge	233	60	50	16.5
2-QQ	Brooks/Route 139/Ryan Property	11	94	93	31.2

TABLE 6-1 (CON'T)

<u>SITE</u>	<u>LOCATION</u>	<u>DAYS SAMPLED</u>	<u>HIGHEST 24-HOUR</u>	<u>SECOND HIGHEST 24-HOUR</u>	<u>ANNUAL GEOMETRIC MEAN</u>
3-A	Bucksport/St. Regis/Fire Station	100	209	151	32.0
3-B	Bangor/Regional Office/31 Central St.	220	171	159	45.3
3-C	Bangor/Kenduskeag Pump Station	217	200	194	53.8
3-D	Bangor/Bangor Daily News	224	249	194	47.0
3-E	Bangor/BIA/Bldg. #487/Air Natn'l Guard	207	99	88	28.5
3-F	Brewer/Fire Station/So. Main St.	117	261	202	55.0
3-G	Brewer/Brewer Junior High School	80	131	125	43.6
3-H	East Millinocket/GNP/Aeration Lagoon	114	74	67	25.6
3-I	East Millinocket/GNP/Katahdin School	117	91	88	26.3
3-J	Lincoln/LP&P/Vocational Ed. Building	356	188	172	44.8
3-K	Lincoln/LP&P/Lincoln Post Office	358	206	188	49.5
3-L	Lincoln/LP&P/Katahdin Avenue Field	356	858	553	65.1
3-O	Millinocket/GNP/Wastewater Treatment Plant	175	91	83	23.9
3-P	Millinocket/GNP/York Street	351	168	157	42.7
3-S	Millinocket/GNP/East Avenue	179	130	125	33.4
3-T	Old Town/Marsh Island Apartments	118	155	132	42.6
3-U	Old Town/Penobscot Shoe Company	109	183	148	37.1
3-W	Newburgh/Newburgh School	333	74	72	19.2
3-X	Milford/Shumway Field	322	109	107	29.1
3-Y	Winn/Diamond International/Hynes/Route #2	60	77	75	20.3
3-Z	Winn/Diamond International/Homgas/Route #2	55	67	43	18.4
3-BB	Calais/Post Office	78	250	222	67.2
3-CC	Calais/Calais Hospital	74	258	124	49.1
3-DD	Woodland/Sewage Treatment Plant	72	248	137	42.5
3-EE	Baring/Moosehorn Nat'l Wildlife Refuge	79	51	39	17.2
3-FF	Woodland/GP/"D" Street	245	94	89	26.6
3-HH	Woodland/GP/Secondary Treatment Pipeline	256	210	207	33.0
3-II	Woodland/Woodland High School	143	197	186	44.9
3-JJ	Woodland/Sunrise Trustworthy Hardware	76	99	91	32.6
3-KK	Eastport/Eastport Elementary School	74	72	62	24.5
3-LL	Eastport/Flagg Furniture	28	79	63	33.3
3-MM	Campobello Island/Roosevelt Park	69	70	52	18.0
3-OO	Woodland/GP/CNS Waferboard Mill	186	141	124	38.2
4-A	Aroostook County/Portage Lake	34	58	44	21.3
4-B	Aroostook County/T12 R8	29	146	77	22.9
4-C	Easton/Patterson Property	69	82	66	13.9
4-E	Madawaska/Madawaska High School	245	462	314	43.7
4-G	Madawaska/Albert Street	296	142	116	37.3
4-I	Presque Isle/Regional Office	55	712	300	90.1
4-J	Presque Isle/High School	147	393	357	44.5
4-K	Presque Isle/Skyway School	145	100	87	25.8
4-L	Presque Isle/Northeastland Hotel	152	568	373	67.0
4-M	Presque Isle/Steego Auto Parts	117	140	100	39.1
4-N	Presque Isle/Creasey Ridge Road	136	55	42	15.2

TABLE 6-2

TOTAL SUSPENDED PARTICULATES

HISTORICAL COMPARISONS-ANNUAL GEOMETRIC MEANS

SITE	LOCATION	ANNUAL GEOMETRIC MEANS (UG/M ³)			
		1978	1979	1980	1981
1-B	Cumberland/Great Chebeague Island	-----	-----	17.4	20.7
1-E	Portland/Portland High School	46.9	48.5	53.6	70.1
1-H	Portland/Seltzer & Rydholm	-----	-----	43.2	52.5
1-I	Portland/Congress Square	-----	-----	53.6	48.2
1-J	Portland/Shelter Site	-----	-----	53.5	50.4
1-L	South Portland/SMVTI/Vocational Drive	30.5	30.9	40.5	37.2
1-M	South Portland/Rigby Yard	-----	-----	73.7	55.9
1-N	Westbrook/S.D. Warren/N.E.T.&T. Company	-----	43.7	42.4	38.8
1-Q	Westbrook/Westbrook Police Department	-----	-----	59.3	60.3
1-R	Westbrook/S.D. Warren/Research Bldg.	-----	-----	55.7	52.0
1-Y	Biddeford/Biddeford Post Office	35.6	39.0	107.7	41.7
2-B	Auburn/Lepage Bakery/Second Street	-----	-----	73.0	53.5
2-C	Lewiston/Post Office/49 Ash Street	51.7	48.0	56.7	53.1
2-H	Jay/IP/Crash Road	-----	24.3	23.8	23.2
2-I	Jay/IP/Jay Hill	-----	27.8	28.0	27.5
2-L	Augusta/Cony High School	49.8	53.5	62.1	59.5
2-Q	Skowhegan/Hinckley	19.8	19.7	16.5	16.1
2-U	Thomaston/Martin Marietta/Dexter Avenue	40.5	33.4	33.5	25.7
2-V	Thomaston/Martin Marietta/Sanders	-----	26.9	29.0	24.5
2-W	Thomaston/Martin Marietta/Pease Property	-----	40.4	50.0	37.8
2-Z	Thomaston/Martin Marietta/Marsh Road	-----	-----	26.4	30.8
2-CC	Mexico/Mexico Treatment Plant	41.0	43.3	48.7	42.0
2-DD	Mexico/Carter Residence	-----	30.3	28.7	26.8
2-HH	South Paris/Wilner Wood/Bessey Motors	69.6	56.4	57.4	52.6
2-II	South Paris/Wilner Wood/Reilly Property	73.3	59.6	53.6	58.7
2-MM	Rumford/Rumford High School	-----	33.0	32.7	28.9
2-PP	Skowhegan/Eaton Ridge	19.6	24.3	16.5	16.5
3-B	Bangor/Regional Office/31 Central St.	54.1	51.9	45.3	45.3
3-C	Bangor/Kenduskeag Pump Station	75.5	68.4	58.3	53.8
3-D	Bangor/Bangor Daily News	57.6	52.6	48.1	47.0
3-E	Bangor/BIA Bldg. #487/Air Natn'l Guard	32.3	31.4	29.3	28.5
3-F	Brewer/Fire Station/South Main Street	53.4	-----	60.3	55.0
3-G	Brewer/Brewer Junior High School	-----	-----	41.4	43.6
3-H	East Millinocket/GNP/Aeration Lagoon	-----	-----	31.1	25.6
3-I	East Millinocket/GNP/Katahdin School	-----	-----	31.3	26.3
3-J	Lincoln/LP&P/Vocational Education Bldg.	43.6	48.6	46.9	44.8
3-K	Lincoln/LP&P/Lincoln Post Office	52.4	53.6	57.1	49.5
3-L	Lincoln/LP&P/Katahdin Avenue Field	-----	53.8	55.8	65.1
3-O	Millinocket/GNP/Waste Treatment Plant	-----	28.7	29.6	23.9
3-P	Millinocket/GNP/York Street	-----	50.5	48.9	42.7
3-S	Millinocket/GNP/East Avenue	-----	36.1	38.6	33.4
3-T	Old Town/Marsh Island Apartments	40.2	38.3	44.5	42.6
3-U	Old Town/Penobscot Shoe Company	-----	29.9	40.0	37.1
3-W	Newburgh/Newburgh School	-----	-----	23.6	19.2
3-X	Milford/Diamond Intern'l/Shumway Field	-----	-----	32.9	29.1
3-Y	Winn/Diamond Intern'l/Hynes/Route #2	-----	-----	26.8	20.3

TABLE 6-2 (CON'T)

SITE	LOCATION	ANNUAL GEOMETRIC MEANS (UG/M ³)			
		1978	1979	1980	1981
3-Z	Winn/Diamond Intern'l/Homgas/Route #2	----	----	28.6	18.4
3-BB	Calais/Calais Post Office	----	----	48.6	67.2
3-CC	Calais/Calais Hospital	----	----	29.8	49.1
3-DD	Woodland/Sewage Treatment Plant	40.3	36.6	37.3	42.5
3-EE	Baring/Moosehorn Natn'l Wildlife Refuge	----	----	15.6	17.2
3-FF	Woodland/GP/"D" Street	----	29.9	31.7	26.6
3-HH	Woodland/GP/Secondary Treatment Pipeline	----	39.7	35.0	33.0
3-II	Woodland/Woodland High School	----	----	32.3	44.9
3-JJ	Woodland/Sunrise Trustworthy Hardware	----	----	24.4	32.6
3-KK	Eastport/Eastport Elementary School	----	----	20.2	24.5
3-LL	Eastport/Flagg Furniture	----	----	26.6	33.3
3-MM	Campobello Island/Roosevelt Park	----	----	14.3	18.0
4-A	Aroostook County/Portage Lake	----	13.8	15.4	21.3
4-B	Aroostook County/T12 R8	----	17.9	15.5	22.9
4-E	Madawaska/Madawaska High School	37.3	39.1	47.1	43.7
4-G	Madawaska/Albert Street	----	25.3	41.0	37.3
4-I	Presque Isle/Regional Office	65.0	67.4	61.8	90.1
4-J	Presque Isle/High School	38.7	39.9	40.8	44.5
4-K	Presque Isle/Skyway School	----	22.7	26.7	25.8
4-L	Presque Isle/Northeastland Hotel	----	----	49.1	67.0

TABLE 6-3

TOTAL SUSPENDED PARTICULATES

HISTORICAL COMPARISON-SITES WITH VIOLATIONS

SITE	LOCATION	TOTAL NUMBER OF VIOLATIONS			
		1978	1979	1980	1981
1-Y	Biddeford/Post Office	0	0	1	0
2-I	Jay/IP/Jay Hill	--	0	1	1
2-L	Augusta/Cony High School	2	4	5	4
2-W	Thomaston/Martin Marietta/Pease Prop.	--	0	1	0
2-CC	Mexico/Mexico Treatment Plant	0	1	1	0
2-HH	So. Paris/Wilner Wood/Bessey Motors	2	3	4	0
2-II	So. Paris/Wilner Wood/Reilly Property	10	8	3	1
2-PP	Skowhegan/Eaton Ridge	0	1	0	0
3-B	Bangor/Regional Office/31 Central St.	0	1	0	2
3-C	Bangor/Kenduskeag Pump Station	10	7	4	3
3-D	Bangor/Bangor Daily News	0	2	1	3
3-F	Brewer/Brewer Fire Station	0	--	3	2
3-I	East Millinocket/GNP/Katahdin School	--	--	2	0
3-J	Lincoln/LP&P/Vocational Education Bldg.	0	2	5	4
3-K	Lincoln/LP&P/Post Office	1	2	5	7
3-L	Lincoln/LP&P/Katahdin Ave.	--	3	18	39
3-P	Millinocket/GNP/York Street	--	0	6	2
3-S	Millinocket/GNP/East Avenue	--	0	2	0
3-T	Old Town/Marsh Island Apts.	0	1	0	1
3-U	Old Town/Penobscot Shoe Co.	--	0	3	1
3-BB	Calais/Calais Post Office	--	--	0	9
3-CC	Calais/Calais Hospital	--	--	0	1
3-DD	Woodland/Sewage Treatment Plant	2	2	4	1
3-HH	Woodland/GP/Secondary Treatment Pipeline	--	2	4	3
3-II	Woodland/Woodland High School	--	--	0	3
3-KK	Eastport/Elementary School	--	--	1	0
4-E	Madawaska/High School	0	1	2	9
4-I	Presque Isle/Regional Office	5	4	4	12
4-J	Presque Isle/High School	0	1	0	3
4-L	Presque Isle/Northeastland Hotel	--	--	0	10

7. LEAD (Pb)

7.1 Description and Sources

Lead in the ambient air exists primarily as particulate matter in the inhalable size range. The predominant source of atmospheric lead is from motor vehicles that burn "leaded" gasoline. The lead in gasoline is in the form of tetraethyl lead, an "anti-knock" compound. Other major sources of atmospheric lead are the extraction and processing of metallic ores.

7.2 Health and Welfare Effects

When atmospheric lead is breathed in, it is absorbed into the bloodstream and distributed throughout the body along with lead from contaminated food and drinking water. Lead accumulation in the body can impair the production of hemoglobin. Clinical lead poisoning occurs when the body's accumulation of lead becomes too high. Symptoms of lead poisoning range from loss of appetite, fatigue, cramps and constipation, and pains in the ankles and wrists to loss of power in the arms and legs, anemia, kidney disease, mental retardation, blindness and death. Lead concentrations in the ambient air are not sufficient to produce lead poisoning but they do increase the risk of harm when other sources of lead are present. And, indirectly, lead fallout from automotive exhaust onto soil and street surfaces can be ingested in considerable amounts by infants and young children.

7.3 Standards

The current National Ambient Air Quality Standard for lead is a 3-month (calendar quarter) average concentration not to exceed 1.5 micrograms of lead per cubic meter of air.

The current State Standard for lead is a 24-hour average concentration of 1.5 micrograms of lead per cubic meter of air not to be exceeded more than once per year.

7.4 Monitoring

Lead was monitored at six sites in Maine during 1981 by taking samples of the Hi-Vol filters from those sites and analyzing the samples for lead content using an atomic absorption analyzer.

Table 7-1 is the 1981 Data Summary for Lead. Table 7-2 presents the Lead Historical Comparison Data.

TABLE 7-1

LEAD (Pb)

1981 DATA SUMMARY
(Micrograms/Cubic Meter)

<u>SITE</u>	<u>LOCATION</u>	<u># OF SAMPLES</u>	<u>HIGHEST 24-HR CONCENTRATION</u>	<u>2ND HIGH CONCENTRATION</u>	<u>ANNUAL ARITHMETIC MEAN</u>
1-K	Portland/Tukey's Bridge	96	1.45	1.26	.59
2-C	Lewiston/Post Office/49 Ash St.	60	1.11	1.11	.29
2-L	Augusta/Cony High School	59	.73	.66	.24
3-C	Bangor/Kenduskeag Pump Station	57	.62	.61	.22
4-I	Presque Isle/Regional Office	40	.96	.85	.30
4-L	Presque Isle/Northeastland Hotel	113	.93	.70	.22

TABLE 7-2

LEAD (Pb)

HISTORICAL COMPARISONS
(Micrograms/Cubic Meter)

<u>SITE</u>	<u>LOCATION</u>	<u>MAXIMUM 24-HOUR CONCENTRATION/AAM</u>			
		<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
2-C	Lewiston/Post Office/49 Ash St.	1.75/.85	1.23/.40	.90/.28	1.11/.29
2-L	Augusta/Cony High School	2.06/1.03	1.46/.48	.99/.34	.73/.24
3-C	Bangor/Kenduskeag Pump Station	2.08/1.19	1.16/.44	.85/.30	.62/.22
4-I	Presque Isle/Regional Office	2.91/1.36	1.70/.49	1.64/.33	.96/.30
4-L	Presque Isle/Northeastland Hotel	-----	-----	.52/.21	.93/.22

8. SULFATES (SO₄)

8.1 Description and Sources

Sulfates are compounds of varying harmfulness found everywhere in the atmosphere. They are produced by nature as well as man. Man-made sulfates have their origin in sulfur dioxide. Fine particulate compounds, including sulfates are formed from chemical reactions between sulfur dioxide emitted into the air and other substances present there. These fine particulate compounds have a long atmospheric residence time, can be transported in the air for long distances, and are capable of penetrating deeply into the human respiratory tract.

8.2 Health and Welfare Effects

Epidemiological studies of populations exposed to particulate sulfates have shown that atmospheric sulfates, more than sulfur dioxide gas or total suspended particulates, are related to aggravation of asthma, aggravation of heart and lung disease in the elderly, and impairment of lung function in school children. This evidence was obtained from EPA's Community Health and Environmental Surveillance System (CHESS). From these studies, estimates of the sulfate threshold for adverse health effects have been derived, as shown in Table 8-1. However, these epidemiological studies have not been substantiated by laboratory studies.

8.3 Standards

There are currently no standards for levels of sulfates in ambient air. EPA is presently working on a standard and will be making a proposal in the near future.

8.4 Monitoring

Sulfate levels were measured at eight sites in Maine during 1981 by taking samples of the Hi-Vol filters from those sites and analyzing the samples for sulfates. Some of the sites are analyzed for sulfates on a routine basis while others may only be analyzed if there has been a violation of an ambient air standard. Because there are no standards and the monitoring methodology is still questionable the data has not been included in this report. As soon as the accuracy of the monitoring methodology is confirmed and a standard is proposed the data will be summarized in the annual reports.

TABLE 8-1

SULFATE THRESHOLDS FOR ADVERSE HEALTH EFFECTS

<u>ADVERSE HEALTH EFFECT</u>	<u>THRESHOLD CONCENTRATION FOR SUSPENDED SULFATES</u>
Aggravation of Asthma	6 to 10 Micrograms Per Cubic Meter for 24 Hours.
Aggravation of Heart and Lung Disease in the Elderly	9 Micrograms Per Cubic Meter for 24 Hours
Subtle Decreases in Childhood Lung Function	9 to 13 Micrograms Per Cubic Meter for 1 Year.
Increase in Acute Respiratory Disease in Children	13 Micrograms Per Cubic Meter for 1 Year.

9. ACID RAIN

9.1 Description and Sources

As a result of the combustion of tremendous quantities of fossil fuels such as coal and oil, the United States annually discharges approximately 50 million metric tons of sulfur and nitrogen oxides into the atmosphere. Through a series of complex chemical reactions these pollutants can be converted into acids, which may return to earth as components of either rain or snow. This acid precipitation, more commonly known as acid rain, may have severe ecological impacts on widespread areas of the environment.

9.2 Health and Welfare Effects

While direct health effects from acid rain have not been documented there are numerous indirect effects which could have a definite effect on mankind. Acid precipitation is known to leach heavy metals such as mercury from rocks causing possible contamination of water supplies. Hundreds of lakes in North America and Scandanavia have become so acidic that they can no longer support fish life. The rain falling on forests and other non-farmlands could, in time, cause extensive changes in the soil chemistry. There is not enough information yet to make it possible to say exactly what the results might be, but there is no reason to think the changes will be beneficial.

9.3 Standards

There are no standards in effect or proposed for acid rain. The only permanent solution to the acid rain problem is to keep the acid levels low. The only practical way of achieving this is by reducing emissions at their sources.

9.4 Monitoring

During 1981 there were four sites collecting data on acid precipitation. Those four sites included two Bureau maintained sites in Bridgton and Acadia National Park, a University of Maine maintained site in Greenville and a National Weather Service maintained site in Caribou. The data for 1981 is still being analyzed and reviewed at this time and is not available for inclusion in this report.

10. HYDROCARBONS (HC)

10.1 Description and Sources

Hydrocarbons are a class of compounds containing carbon and hydrogen in various combinations. They are found especially in petroleum, natural gas and coal. Some are gaseous, some liquid and some are solid. There are in fact over a thousand hydrocarbon compounds. Many of the polluting hydrocarbons are discharged into the air by incomplete combustion of organic materials. A major source of this kind of hydrocarbon emission is the burning of gasoline in automobiles. Other major contributors are organic solvent evaporation, industrial processes, solid waste disposal and fuel combustion in stationary sources. The control of hydrocarbon emissions are accomplished by combustion process optimization, recovery by mass transfer principles, restriction of evaporative loss and process material and fuel substitution.

10.2 Health and Welfare Effects

Hydrocarbon air pollutants enter into and promote the formation of photochemical smog (ozone) and thus contribute to the development of eye irritation and respiratory tract problems. By themselves, hydrocarbons may induce adverse health effects, although there is relatively little quantitative data to relate individual hydrocarbons to the risk of human disease.

10.3 Standards

The present State and Federal Standard for non-methane hydrocarbons is a three hour average concentration of 160 ug/m³.

10.4 Monitoring

Hydrocarbons were monitored at only one site in the State during 1981. This monitoring was conducted as part of the ozone program operated in Portland during the ozone season. However, insufficient data was collected during the summer to summarize in a meaningful form.

11. HYDROGEN SULFIDE (H₂S)

11.1 Description and Sources

Hydrogen sulfide is a colorless gas with the very disagreeable odor of rotten eggs. Hydrogen sulfide can be found naturally where sulfur containing compounds are decaying. However, the major source of hydrogen sulfide would be as a by-product from petroleum refining, kraft pulping for paper production and various chemical processes.

11.2 Health and Welfare Effects

In addition to the annoying odor, hydrogen sulfide can tarnish silverware and copper and can darken the lead in paint which may ruin the exterior of some homes. In dilute form hydrogen sulfide can cause nausea, headaches and dizziness. In concentrated form hydrogen sulfide can be lethal.

11.3 Standards

There is currently no ambient air standard for hydrogen sulfide.

11.4 Monitoring

A limited amount of data was collected at two sites in Jay, Maine during 1981 but because there are no standards that data has not been included in this report.