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REGIONAL ADMINISTRATOR'S ANNUAL REPORT

ENVIRONMENTAL QUALITY IN NEW ENGLAND

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From the Regional Administrator:

This is the U.S. Environmental Protection Agency's fourth annual report on environmental quality in the six New England states -- Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

It covers air, surface water, and drinking water quality, and solid waste management.

Since last year's report, the Congress has passed important amendments to two of the Agency's most important pieces of legislation -- the Clean Air and Clean Water Acts. The new laws represent mid-course corrections rather than major overhauls of the two laws. They continue the programs authorized by the old laws, but with some changes to help us meet our goals. The most significant of these changes are the incentives for innovative and alternative wastewater treatment technologies, and the codification of the "off-set" policy for reducing air pollution that was developed under but not incorporated into the old legislation.

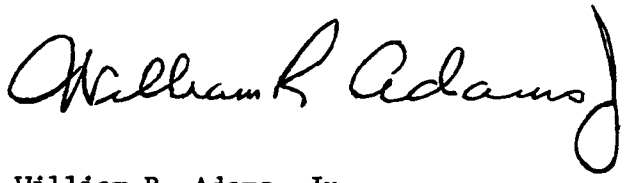
These new laws will provide exciting and new challenges to us in running our programs. But we cannot forget that running programs is not our goal. Our goal is to achieve and maintain a quality of air fit to breathe, surface water fit for recreation, pure drinking water, and waste management practices sufficient to protect public health and the environment.

Generally speaking, progress in these areas has been slow but steady in the last year. EPA is entering a period during which its achievements will be much harder won, and less dramatic, if no less significant than in the early days of the Agency's existence.

This is true because the Agency concentrated first on the largest and most damaging polluters, and control of those sources resulted in dramatic improvements. The pollution with which we are dealing now is generally smaller sources and the gains are cumulative rather than sudden.

In addition, the types of controls we need to implement now are often more expensive to meet higher standards of treatment, or they have more direct impact on individual citizens, as is the case with mandatory inspection and maintenance of automobiles. Thus we have an even greater responsibility to seek public involvement.

I am confident, however, that this Agency, along with state and local governments and the informed participation of the public, can solve the problems that remain to us to the maximum benefit of the environment with the minimum of adverse effect on the economy. I hope that all of you will support us and work with us to achieve this goal.



William R. Adams, Jr.

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AIR QUALITY

Many scientific studies have shown that air pollution is responsible for a number of respiratory illnesses such as chronic bronchitis, emphysema, and increased incidence of lung cancer. High levels of air pollution also increase the discomfort of individuals suffering from allergies and contribute to increases in respiratory illnesses such as pneumonia and bronchial asthma. On a national level, air pollution is estimated to result annually in 15,000 excess deaths, 15 million days of restricted activity, and seven million sick days.

The federal Clean Air Act requires the Administrator of the Environmental Protection Agency to set ambient air quality standards designed to protect the public health (primary standards) and the public welfare as measured by effects of pollution on vegetation, materials, and visibility (secondary standards). Once such standards have been established, the states are required by law to develop State Implementation Plans (SIP's), consisting of regulations and other controls to provide for the attainment and maintenance of these standards. The EPA has established ambient air quality standards for five pollutants; sulfur dioxide, total suspended particulates, carbon monoxide, photochemical oxidants (smog), and nitrogen oxides. The short term standards establish levels which may not be violated more than once a year. (It should be noted that it is possible to have a single exceedance, i.e., one reading above the standard, but if the second highest value does not exceed the standard, no violation is considered to have occurred.)

In recent years, it has become apparent that attainment of air quality standards is a more complex process than originally anticipated. The attainment dates specified in the 1970 Clean Air Act were not met despite very intense efforts by the states and EPA to regulate identifiable contributors to air pollution violations. In August, 1977, the Clean Air Act was amended which increased requirements to prevent significant deterioration of air quality in clean areas, and extended the time frame in which states must develop regulatory programs to attain air quality standards in nonattainment areas. As required by the amendments, during 1977 each state reviewed its air quality record and formally designated portions of New England as attainment, unclassified, or nonattainment for each of the five pollutants. These were subsequently approved by EPA with only minor changes, and are presented in Figures 1 through 5. For the areas classified nonattainment each state is now required to determine the causes of violations and to adopt the necessary programs, including revisions to the SIP's, needed to ensure attainment of standards. Necessary plan revisions must be submitted to EPA by January, 1979 and must demonstrate attainment by January, 1982 or as expeditiously as possible.

Pollutant Standards Index -- This index was proposed by EPA as a single measure which could be used to report air quality nationwide. During 1977, a number of states began to use the Pollutant Standard Index (PSI) to advise citizens of air quality on a daily basis. The PSI structure includes the pollutants for which primary National Ambient Air Quality Standards (NAAQS) have been established. For each pollutant, the Index scale ranges from 0 to 500, with 100 corresponding to the primary NAAQS concentrations and 500 corresponding to the significant harm levels. PSI is primarily a health-related index, using such descriptor words as "good," "moderate," "unhealthful," and "hazardous" (Table 1).

There is a direct relationship between this descriptor index and short term air quality standards (i.e., daily, 8-hour, 1-hour). However, long term standards are not reflected in the PSI. Presentations in this report reflect both actual air quality levels and PSI where appropriate.

Sulfur Dioxide -- The principal source of sulfur dioxide (SO_2) is combustion of fossil fuels containing sulfur. In New England, sources of SO_2 emissions include power generating stations, industrial boilers, pulp mills, and residential and commercial heating. Figure 1 shows the nonattainment designation for SO_2 in New England based on data collected from mid 1975 through 1977. During the latter half of 1977, violations of the 24-hour primary standard for SO_2 (365 ug/m^3) were recorded in Millinocket, Maine and in Berlin, New Hampshire at stations established during 1977 to monitor effects of local industrial activity. Table 2 presents a graphical summary of SO_2 during this period. The sites in Table 2 were selected based on record length and are typical of the peak concentrations in each state.

EPA, in conjunction with the Maine Department of Environmental Protection and the New Hampshire Air Pollution Control Agency, has initiated actions to reduce the elevated SO_2 levels in Millinocket and Berlin. EPA anticipates that compliance with all SO_2 standards will be achieved by the statutory attainment date, December 31, 1982.

Total Suspended Particulates (TSP) -- Particulate matter is generated by a variety of sources. Those which were identified and regulated during the early 1970's are called traditional sources and include fuel burning, industrial processes, and incineration. Data collected in recent years show that other activities are also substantial contributors to elevated TSP concentrations. Such activities are called non-traditional sources and include reentrainment of road dust caused by traffic, automotive tailpipe emissions, rubber tire wear, unpaved parking lots, and construction/demolition activities. Figure 2 shows that portions of each New England state have been designated nonattainment due to measured or projected violations of the primary or secondary standard for total suspended particulates.

EPA distinguishes between two categories of monitoring stations for particulate matter. Zone A sites are those stations which are located near heavily traveled roadways and may be heavily influenced by reentrainment. Levels recorded at such sites are likely representative of localized air quality only, and not of levels to which the general population may be exposed for long periods of time. Zone B sites are those stations which do reflect long term population exposure and are indicative of health effects of TSP on the residents of the area. Background sites constitute the cleanest Zone B sites. Table 3 presents annual average levels at background, Zone A and Zone B sites in New England. The sites in Table 3 were selected to reflect peak levels for each category in each state. The most extreme TSP violations of both the annual and 24-hour standard have been recorded at numerous Zone A sites. On the other hand, during 1977, Worcester, Massachusetts recorded an exceedance of the primary (24-hour) standard for TSP as reflected by Zone B monitoring. Violations of the 24-hour secondary standard (150 ug/m^3) are more prevalent in New England as reflected in Figure 2. Efforts toward development of control plans in nonattainment areas are presently underway.

Photochemical Oxidants -- Photochemical oxidants, or smog, are formed by a chemical reaction in the presence of sunlight from volatile organic compounds and nitrogen oxides. Emissions of these compounds result from combustion, industrial processes, and gasoline handling. Automotive emissions produce approximately 50 percent of these volatile compounds in New England air. The remaining 50 percent are emitted by stationary sources, such as dry cleaning and degreasing operations, fabric and paper coating, printing and painting, gasoline storage and distribution, fuel combustion, and incineration. Figure 3 shows the prevalent nonattainment status for photochemical oxidants in New England. During 1977, the primary health standard for photochemical oxidants of 160 micrograms per cubic meter (160 ug/m^3) was violated repeatedly throughout New England. Highest levels in each state were recorded at Derby, Connecticut(657 ug/m^3); West Newbury, Massachusetts (441 ug/m^3); Providence, Rhode Island (392 ug/m^3); Cape Elizabeth, Maine (450 ug/m^3); Portsmouth, New Hampshire (451 ug/m^3); White River Junction, Vermont (253 ug/m^3). Table 4 shows the levels recorded at selected sites in New England and the frequency of violations for the period 1974-1977. Of equal concern with the level of violation is the frequency with which they occur. Table 4 shows that frequency of violation at these sites remains high. Photochemical oxidants continue to be the major air pollution problem in New England.

Since oxidant formation and transport mechanisms are extremely complex, it is frequently not clear from one day to the next what sources are contributing to ambient oxidant violations. It is known that (depending upon meteorological conditions) ambient levels will be caused by both emissions from within a state and emissions from outside a state. In recognition of this, the 1977 Clean Air Act Amendments require states to develop similar strategies to reduce volatile organic compound emissions within all oxidant nonattainment areas. The Act allows an additional 5 years (to 1987) to meet the standards if states can show standards will not be met by 1982 even after implementation of all reasonable measures. Because most oxidant forming

precursor emitters are located around cities, EPA initially will be working with the states to develop uniform oxidant reducing strategies in the major metropolitan areas across the country. In New England, particular attention will be given to the Boston, Worcester, Springfield, Lowell, Lawrence, Haverhill, Providence, Hartford, New Haven, and Bridgeport metropolitan areas although most strategies are to be implemented statewide in southern New England. Strategies dealing with the inspection and maintenance of motor vehicle exhausts, the control of gasoline vapors from gas stations, loading facilities and storage tanks, emissions from industrial sources such as dry cleaning, surface coating and general solvent use, and motor vehicle use reduction will be studied in detail and applied as necessary. Controls in northern New England will focus primarily on major stationary sources.

Carbon Monoxide -- Virtually all of the carbon monoxide found in New England results from motor vehicle emissions. Carbon monoxide (CO) is a localized problem, occurring primarily in urbanized areas subject to traffic congestion. In such areas, CO peaks coincide with daily traffic peaks and the highest levels are observed close to major highways and heavily travelled streets and intersections. Control strategies would focus around reducing emissions from the motor vehicle itself and reducing traffic congestion. Figure 4 shows the attainment/nonattainment status for this pollutant in New England. Table 5 shows the 1974-1977 trend in CO 8-hour standard violations and maximum levels at selected sites indicative of peak levels which occur in each state in New England. The 8-hour primary standard continues to be approached or violated at monitored urban locations throughout New England. However, many sites in New England have measured lower CO levels and fewer violations in 1977 than in previous years. Some of this reduction is attributable to the effects of the Federal Motor Vehicle Emission Control Program which reduces tailpipe pollutants. Further analyses will be necessary to determine other causative factors.

Strategies to control motor vehicle pollution focus on implementation of motor vehicle Inspection/Maintenance programs, voluntary Gas Saver's Check efforts and enforcement of existing tampering regulations. An I & M program is being implemented in Rhode Island with the mandatory maintenance phase to commence in January, 1979. Connecticut has adopted enabling legislation for a program scheduled to start in 1980. Massachusetts is considering similar programs and has established a Legislative Study Commission to evaluate various options. In the northern states, Maine and New Hampshire are both considering adopting a requirement to inspect pollution control equipment during annual safety inspections.

It is anticipated that these programs will do much to reduce emissions from motor vehicles. For example the Connecticut I & M program is expected to reduce hydrocarbon emissions by 20 percent and CO emissions by 38 percent. Such programs are expected to result in a considerable reduction in motor vehicle pollution.

Nitrogen Dioxide -- Nitrogen oxides result from fuel combustion and motor vehicle emissions. All areas in New England have been designated attainment for nitrogen dioxide (NO_2). Available monitored data are insufficient to present historical information.

SURFACE WATER QUALITY

The federal Clean Water Act, has as its goal the restoration of the nation's water to a quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water by July 1, 1983.

State water quality standards vary according to the category of use for the surface waters involved. Class "A" waters are suitable for water supply without further treatment except simple disinfection. Class "B" waters are suitable for swimming and fishing, and Class "C" waters can be used for fishing, but not swimming. By these definitions, only Class "A" and Class "B" waters would meet the national fishable/swimmable goal. Generally the state standards established for the New England rivers, lakes, and coastal areas provide for fishable/swimmable water.

In addition to use categories, water quality standards specify criteria which must be met to ensure that uses are maintained. Numerical or narrative criteria for Class "B" waters, the minimum classification which will meet the 1983 goal, include bacteria (coliform) limits to protect the health of swimmers, dissolved oxygen levels high enough to ensure the protection and propagation of fish and wildlife, and prohibitions on the presence of toxic substances. In addition, Class "B" waters must be low in turbidity, and free from excessive algae.

Although the major thrust of water pollution control efforts nationwide has been to restore polluted streams to fishable/swimmable status, a crucial element of an effective water quality management system for New England is the preservation of those waters which are currently of good quality. New England has an abundance of priceless clean lakes and streams whose quality must be protected and preserved to maintain their value. A major part of our future activities must be directed toward preserving the recreational and aesthetic potential of these resources.

Current Water Quality Conditions

Fifty-three percent of New England's major streams currently meet the 1983 fishable/swimmable goals of the Clean Water Act. Three thousand six hundred fourteen of the total 6,798 miles of major river mainstems and tributaries assessed were suitable for fishing and swimming (see Table 6). This represents a 5 percent improvement in stream quality during calendar year 1978 and 7 percent improvement since 1976. Because several states have recently improved their assessment procedures or reported additional stream miles, the 1978 figures are not directly comparable to statistics contained in the 1977 Annual Report. The figures above and the statistics for 1976 and 1977 included in Tables 6 and 7 have been adjusted to a common basis for comparison with 1978 reporting. (See note 1 and 2, Table 6.)

It should also be noted that only the major river mainstems and tributaries are assessed in this report. Most of New England's thousands of miles of smaller upland tributaries are meeting the fishable/swimmable standard. For example, Connecticut reports that 93 percent of its total stream miles are now meeting or exceeding the Class B standard, while only 42 percent of the major streams are meeting those standards. Vermont reports 92 percent for total miles versus 67 percent for major stream miles.

Violation of coliform bacteria standards occurred in most of the major New England rivers assessed. Although raw or inadequately treated municipal and industrial discharges have historically been considered the major cause of these violations, combined sewer overflows and urban runoff are now surfacing as the major cause of coliform problems downstream of many urban areas. Areas adversely affected include Boston Harbor, New Haven Harbor, the Charles River, the Connecticut River, and Narragansett Bay. Agricultural and silvicultural practices are responsible for coliform violations in many rural areas.

The dissolved oxygen conditions in many New England streams are improving as wastewater treatment systems come on line. Depressed oxygen levels remain a critical problem in many slow moving streams with large deposits of sludge. Examples of this type of critical water quality problem occur in the Charles River, the Blackstone River, the French River, the Nashua River, the Presumpscot River, and the lower Winooski River.

The 5 percent improvement in overall water quality is generally the result of controlling point sources of pollution. Hundreds of millions of dollars worth of municipal wastewater treatment facilities are under construction or are just now coming on line. All of the major industrial dischargers in the region have been issued enforceable "clean-up" permits. Many of the region's streams are starting to demonstrate considerable improvement and we expect to see an acceleration of water quality improvements as more municipal and industrial discharges are controlled.

As the point sources of pollution come under control through the construction grants and NPDES permit programs, non-point sources such as urban and agricultural runoff will have an increasingly noticeable impact on water quality. Section 208 of the Clean Water Act authorizes EPA to administer an areawide wastewater treatment management planning program. The so-called "208" planning programs are designed to control complex water quality problems including urban runoff, agricultural and silvicultural runoff, septage management, and lake eutrophication, as well as municipal and industrial discharges. To date, more than $15.1 million in 208 grants have been made to the 17 areawide planning agencies and to the 6 New England states to prepare these 208 water quality management plans. Although most of the areawide plans are now going through the final review phase, many of the interim achievements of these programs have been implemented in the local communities and are now resulting in improvements to water quality.

Summaries of the water quality conditions in the six New England states are shown in Table 7. The information comes from reports filed with EPA by the individual states.

The following is a brief summary of the major problems and recent progress in each of the New England states.

Connecticut

The big news in Connecticut's water quality 1978 was the detection of PCB pollution in the Housatonic River. Discovery of PCB's — a very persistent chlorinated hydrocarbon used for its insulating qualities -- in the fish and bottom sediments caused the downgrading of 51 miles of the Housatonic from Class B to Class D. Recognizing that this problem has probably been in existance for several years and recalculating last year's percentages accordingly, Connecticut reports for 1978 that 42 percent of the state's major river miles assessed are meeting fishable/swimmable standards. This is only a 1 percent improvement over the 41 percent reported in 1977, but a 7 percent improvement over the 34 percent reported in 1976. If all streams including smaller upland tributaries were evaluated, approximately 92 to 94 percent of the state's total stream miles would now be meeting the fishable/swimmable goal.

Although the PCB problem in the Housatonic is currently the hottest water quality issue in Connecticut, other major problem areas include the French and Quinebaug Rivers, the Connecticut River, and the Quinnipiac River. Combined sewer overflows in Massachusetts and Connecticut cause severe pollution problems in the Connecticut River from the state line to below Hartford. Combined sewer overflows are also responsible for water quality standards violations in the Thames River downstream of Norwich and in the coastal waters around the major urban centers of New Haven and Bridgeport. The French, Quinebaug, Quinnipiac, Hockanum, and Pequabuck Rivers suffer dissolved oxygen sags due to large municipal and industrial loadings to areas with minimum stream flows.

Statistical analysis of the major streams assessed indicates that Connecticut's water quality is improving. Of the 92 tests performed, 77 percent show signs of improvement. Dissolved oxygen levels and stream turbidities have been steadily improving, while coliform pollution remains a problem in most major areas. Significant water quality improvements have been reported on the Willimantic River, the Yantic River, the Naugatuck River, and the Farmington River.

It is projected that 98 percent of Connecticut's total stream miles will be fishable/swimmable by 1983; however, only 68 percent of the major stream areas are projected to meet these same goals. Major problems that will have to be addressed in these critical areas are the control of urban runoff and combined sewer overflows.

Maine

Maine reports that 62 percent of the state's 1,930 miles of major streams are meeting the fishable/swimmable goals of the Act. Although the percentages reported this year are the same as last year's, there were improvements recorded on portions of the Prestile Stream and the Aroostook River. The Prestile Stream was improved due to the termination of two major discharges and the operation of a new subsurface disposal system at an industrial installation. A portion of the Aroostook River was upgraded due to an existing industrial discharge being treated by flood irrigation.

In addition, major water quality success stories were reported on Haley Pond, Rangeley Lake, and the Bangor Pool portion of the Penobscot River. The state's first advanced waste treatment plant is credited with reducing the nutrient loading and eutrophication of Haley Pond and Rangeley Lake. The control of nutrients reduced algal blooms and improved dissolved oxygen and visibility in these two valuable recreational lakes. Industrial and municipal clean-up programs have reduced pollution levels in the Penobscot River to such an extent that fishing for Atlantic Salmon is once again a popular pastime in the Bangor Pool area.

Large industrial discharges continue to cause serious dissolved oxygen problems on the St. John and St. Croix Rivers. Municipal and industrial discharges and sewer overflows result in severe dissolved oxygen, coliform, and solids problems in the Little Androscoggin River and the Presumpscot.

All industrial dischargers in the state are now on line with their treatment or pretreatment requirements and all municipalities are in the process of providing adequate treatment. With the municipal and industrial clean-up progressing, the water quality problems in coming years will be the sediment oxygen demand created by years of untreated discharges, the coliform and solids contributed by combined sewer overflows, and the dissolved oxygen and coliform problems associated with non-point sources of pollution. It is projected that 93 percent of Maine's major stream miles will meet the fishable/swimmable goals of the Act by 1983.

Massachusetts

There has been a great deal of improvement in the quality of the water throughout the state over the past year. This year, Massachusetts reports that 35 percent of the state's major streams meet the fishable/swimmable goals of the Act. Because the state's 1978 report assessed additional stream segments not included in 1977 or 1976, it is difficult to directly compare this year's 35 percent with the 28 percent and 24 percent previously reported. Although it is evident that Massachusetts still has the lowest percentage of miles meeting the fishable/swimmable goals, the state's waters are showing the highest rate of improvement in the region.

Water areas that have shown substantial improvement over the past year include the Deerfield River and the Nashua River. Recent surveys have shown that 30 additional miles of the Deerfield have been improved as a result of municipal and industrial clean-up efforts. Sixty-eight miles of the basin's 80 total miles are now fishable/swimmable. The Nashua River which was once considered one of the nation's 10 dirtiest rivers has undergone a remarkable improvement. This river, which was foul smelling and covered with junk and sludge banks just 10 years ago, is now a popular canoeing and recreational area. Dissolved oxygen levels have improved significantly in areas that once were biologically dead. Although there are still problems around the cities of Fitchburg, Leominster, and Clinton, the Nashua could become one of the nation's first true water quality clean-up success stories.

There are still major problems associated with the waters in the large urban areas. The Charles and Mystic Rivers and Boston Harbor suffer from coliform violations due to major combined sewer overflow problems and urban runoff from the Boston Metropolitan area. Combined sewer overflows are also the cause of the critical problems in lower Connecticut River, the Blackstone River, the Nashua and Merrimack Rivers. Large municipal loadings and small stream flows present critical problems in the Concord River and the French River. The PCB's which are found in the bottom sediments of portions of the Housatonic River and New Bedford Harbor are also of major environmental concern.

Massachusetts projects that 88 percent of the major stream miles will meet the fishable/swimmable standards by 1983.

New Hampshire

The percentage of New Hampshire's major streams that are meeting fishable/swimmable standards increased 6 percent over the past year. Fifty-two percent of the state's 1,280 miles of major waterways now meet the goals of the Clean Water Act. Approximately 96 percent of all the state's waterways, including upland streams are now meeting or exceeding Class B standards.

Improvements have been documented along the following reaches: 8 miles of the Warner River, 4 miles of the Merrimack River, 3 miles of the Upper Ammonoosuc River, and 42 miles of the Connecticut River. Although not documented this year, about 8 miles of the Ammonoosuc River below Lisbon and about 10 miles of the Suncook River below Pittsfield have improved significantly as a result of municipal pollution clean-up programs. The diversion of several discharges to the Laconia wastewater treatment plant, and the upgrading of this facility to allow for phosphorous removal has reduced nutrient loading and improved the water quality of Lake Winnisquam. For the first time since 1961, the application of copper sulfate to control algae blooms was not necessary on Winnisquam.

Although conditions are improving on the Androscoggin, there are dissolved oxygen and coliform problems as a result of municipal and industrial discharges. Combined sewer overflows and urban runoff in Manchester and Nashua add significant coliform and solids loadings to the Merrimack River.

It is projected that 96 percent of New Hampshire's major stream miles will meet the fishable/swimmable goals by 1983.

Rhode Island

Rhode Island reports that 64 percent of the state's major stream miles and 92 percent of estuarine areas are now meeting the fishable/swimmable goals of the Act. Although this report indicates no improvement over last year's report, the effects of major treatment plant construction in Woonsocket (Blackstone River) and East Providence (Providence River) should significantly improve water quality in these areas over the next year.

Rhode Island's biological monitoring program has indicated various degrees of water quality improvement at stations located on the Branch River, Blackstone River, Pawcatuck River, and Fry Brook. These improvements are associated with improved treatment at upstream pollution sources. Major combined sewer overflows and urban runoff problems in Providence and Newport cause coliform and solids violations in the Providence River, Woonasquatucket River, and Narragansett Bay. Large municipal and industrial discharges coupled with minimal assimilative capacities result in dissolved oxygen problems in the Pawtuxet River and Mashapaug Brook. The Blackstone River and Mount Hope Bay have dissolved oxygen and coliform problems as a result of combined sewer overflows and municipal and industrial discharges.

Rhode Island projects that 73 percent of the state's major stream miles will meet the Clean Water Act goals by 1983.

Vermont

Vermont's 1978 report indicates that 67 percent of the state's 1,196 miles of major streams were meeting the fishable/swimmable goals of the Act. Vermont now has the highest percentage of fishable/swimmable waters in New England. If all of the state's smaller upland streams were included in the assessment, 93 percent of Vermont's waters would be suitable for fishing and swimming.

Coliform bacteria violations exist in many of Vermont's streams due to non-point source pollution originating from agricultural, silvicultural, and urban activities. Combined sewer overflows cause localized coliform and solids problems in water courses near 19 Vermont communities. Otter Creek and the lower Winooski River suffer major dissolved oxygen and coliform problems because of combined sewer overflows and municipal point source loadings.

As more municipal and industrial pollution control facilities are completed, Vermont's waters should continue to improve. By 1983, 94 percent of the major stream miles are projected to meet fishable/swimmable goals.

Lakes

Lakes are one of New England's most valuable aesthetic, recreational, and economic assets. Eutrophication, or accelerated aging, threatens the usefulness of many of New England's lakes and impoundments. Pollutants -- particularly phosphorus and nitrogen from municipal wastewater treatment plants and non-point sources -- and sediments can contribute to excessive growth of aquatic weeds, or eutrophication. Eutrophication reduces a lake's ability to support a balanced population of aquatic life and limits the recreational potential of the lake.

Eutrophication is an inevitable natural process, although it can be speeded up by human activities, so all lakes and impoundments, whether or not they currently exhibit eutrophic signs should receive special protection and management.

Many of the significant lakes in New England are showing signs of eutrophication. For example, Maine lists 20 areas that are considered culturally stressed problem lakes including the large areas of Sabattus Lake, Sebasticook Lake, and Cobbosseecontee Lake. New Hampshire has classified 22 lakes as eutrophic; previous studies carried out several years ago indicated 20 percent of the significant lakes in Massachusetts and 24 percent of the Connecticut lakes were suffering from the same problem.

In 1975 a Clean Lakes Program was initiated under Section 314 of the Clean Water Act. This section provides for federal participation in lake rehabilitation and preservation programs. This program provides the first opportunity for EPA to emphasize the need to place priority on restoring one of our region's most vital resources -- our lakes. EPA has supported lake restoration projects at Morses Pond, Wellesley, Massachusetts; Lake Cochituate, Natick, Massachusetts; Ellis Brett Pond, Brockton, Massachusetts; Annabessacook Lake, Winthrop, Maine; and Lake Bomoseen, Castleton, Vermont.

Significant improvement in water quality has resulted from the elimination of municipal and individual sewage disposal discharges into Annabessacook Lake (New Hampshire), Rangeley Lake (Maine), Haley Pond (Maine), and Lake Winnisquam (New Hampshire).

DRINKING WATER

On June 24, 1977, the Interim Primary Drinking Water Regulations promulgated under the Safe Drinking Water Act became law. These regulations apply to all public water supplies with more than 15 service connections or which regularly serve more than 25 individuals.

The 2,961 water supplies in New England covered by these regulations are located as follows: Connecticut, 763; Massachusetts, 641; Maine, 397; New Hampshire, 707; Rhode Island, 128; and Vermont, 329.

The regulations set maximum contaminant levels (MCL) for inorganic chemicals, including lead; fluoride; organic chemicals; turbidity; and bacteria. The regulations also require periodic testing of public water supplies, and public notice if any of the MCL spelled out in the regulations are exceeded.

The following chart summarizes violations of the MCL specified by the regulations.

	Maximum Contaminant Level Exceeded					Public	
	Bacteria	Turbidity	Fluoride	Lead	Sampling	Notice	Totals
NH	881	4	7	0	25		917
CT	95	14	0	0	0	48	157
ME	21	1	0	0	0		22
RI	4	0	0	1	14	5	24
MA	69	47	0	0	60	13	189
VT	68	7	0	0	464	—	539
TOTALS	1,138	73	7	1	563	66	1,848

The intent of the law is for states to have primary enforcement authority as soon as they can demonstrate their ability to enforce standards at least as stringent as the federal standards.

Connecticut was the second state in the United States to be awarded primacy under the Safe Drinking Water Act, and Massachusetts and Maine have also obtained this authority. Rhode Island and New Hampshire applications have been approved but requests for public hearings have delayed granting primacy. Vermont, which received the first EPA program support grant in the country, has not been able to obtain this authority and must wait until the legislature reconvenes in 1979 for another attempt to pass the necessary legislation.

Some progress has been made in dealing with water supply problems discussed in previous annual reports.

Bacteria -- In June 1978 an outbreak of campylobacter enteritis occurred in Bennington, Vermont and an estimated 2,000 people may have been affected by the illness. Epidemiological investigations implicated the town's drinking water. A boil water order was issued and the town has begun construction of a water treatment plant.

Monitoring for giardia cysts has continued in Berlin, New Hampshire and cysts were found during one sampling period. However, no outbreak of giardiasis has recurred.

Lead -- The problem of lead in drinking water in New England derives from a combination of two basic factors. First, the water supplies in New England are quite acidic and are very low in naturally occurring substances such as calcium and magnesium. Many of our supplies are so low in these constituents that they approach distilled water in purity. This type of water tends to be very corrosive.

The second basic factor is the widespread use of lead pipe for conveying water to homes. The corrosive water dissolves lead from lead pipes as the water passes through the pipe, producing in many instances lead levels in drinking water which are several times in excess of EPA's standard of 0.05 milligrams per liter.

The Metropolitan District Commission (MDC) which supplies water to the Boston Metropolitan area has been attempting to correct its lead contamination problem for several years. In June of 1976, the MDC instituted a program of adding zinc orthophosphate, a commercial corrosion inhibitor. Continued monitoring by EPA showed that after six months of treatment, high lead levels persisted in drinking water. In December 1976, EPA advised the MDC that additional treatment was necessary and that caustic should be used. The MDC is now adding caustic to the water to raise the pH and reduce the acidity of the water. Results shown in Graph 1 indicate that pH adjustment is reducing lead levels.

Another area of interest is the Bennington, Vermont lead problem. After a Vermont state survey had revealed excessive water lead levels, an individual in the town petitioned EPA to take action under the emergency powers section of the Safe Drinking Water Act. EPA conducted extensive sampling in the town, and confirmed the very high lead levels. Because the town and the state have both acted expeditiously to alert citizens to the problem and to institute treatment to reduce the corrosivity of the water, EPA recognized that an imminent health hazard existed but declined to take action at that time.

Bennington began adding caustic and sodium bicarbonate in June, 1977 to its water. The effectiveness of this treatment is shown in Graph 2.

Chlorides and Sodium -- Chlorides in drinking water pose a significant problem for residents of New England. During the late 1950's and early 1960's, the average concentration of chlorides in drinking water began to rise. Although the levels were generally well below the 250 parts per million guideline used by most states, the trend was not encouraging. However, in recent years the rise has begun to level off. This leveling off may be attributed in part to much more judicious use and storage of road salt, which is the main source of chlorides to New England water supplies. EPA is currently investigating alternative technologies for roadway snow and ice control.

Sodium is the other major component of road salt. Even when chloride levels fall below the public health standard, the levels of sodium associated with the chlorides may be hazardous to the increasing number of people on sodium-restricted diets. Also, many physicians believe that the restriction of sodium intake may be of general physiological benefit, so sodium levels in drinking water may be of concern to the general public and not just to those people on sodium-restricted diets.

EPA does not have data on sodium in New England water supplies, but hopes the reduction in road salting will have the effect of reducing sodium levels.

Organics -- Work has continued at several New England sites on the removal of selected organic substances such as chloroform with activated carbon and a synthetic resin.

Manchester, New Hampshire has received an EPA grant that will enable the water utility to construct a carbon reactivation plant. This will enable EPA to determine the costs involved in reactivation of carbon and if the effectiveness of organic removal is diminished after the reactivation process.

Contamination of ground water with organic chemicals continues to be a problem in parts of New England. A study of surface impoundments and their potential for ground water contamination has been undertaken in New England with grants awarded to each of the six states.

SOLID AND HAZARDOUS WASTE MANAGEMENT

The Resource Conservation and Recovery Act of 1976 (RCRA) mandates national action against waste management practices which may result in public health and environmental hazards. It also seeks to promote conservation, source reduction, resource recovery, and sound disposal practices -- cradle to grave management of solid wastes.

During the past year, all of the New England states' hazardous waste surveys were completed. These surveys will be essential in the development of comprehensive hazardous waste management programs. The New England states are moving forward with legislation which will provide them with authority to control hazardous waste generation, transportation, storage, treatment, and disposal. The Rhode Island state legislature recently passed the Rhode Island Hazardous Waste Management Act which established a hazardous waste management program within the Department of Environmental Management.

Incidents of improper disposal of hazardous wastes continue to occur in the New England region. State agencies have been successful in clearing up and properly disposing of hazardous wastes at hazardous waste dump sites in Plainfield, Connecticut and Rehoboth, Massachusetts. EPA also provided technical assistance to the Maine Department of Environmental Protection to analyze a water contamination incident in the town of Gray caused by the improper disposal of hazardous wastes. The community and state governments are currently taking steps to provide an alternate water supply to members of the community affected by the incident.

The Massachusetts Division of Water Pollution Control, also with EPA technical assistance, has inspected, analyzed, and formed a strategy for the clean-up and proper disposal of a diverse assortment of chemicals which have been accumulated at the now defunct Silresim Corporation facility at Lowell, Massachusetts.

The Technical Assistance Panel Program was formally initiated this fiscal year in the regional office. The panels are authorized by RCRA, which requires EPA to "provide teams of personnel, including federal, state, and local employees or contractors to provide states and local governments upon request with technical assistance on solid waste management, resource recovery, and resource conservation. Such teams shall include technical, marketing, financial, and institutional specialists, and the resources of such teams shall be provided without charge to states or local governments."

Assignments initiated to date include assistance to Auburn, Maine, in procuring a small scale steam generator, analysis of energy markets for Rhode Island Solid Waste Management Corporation, and a study of rural resource recovery facilities in southern New Hampshire.

Community recycling programs in New England are rapidly increasing in numbers, with over 260 known programs in existence. There also are 43 programs of separate curbside collection of recyclable materials.

Region I now has 14 rural resource recovery facilities in operation. This number is double that of last year. Many more facilities are in planning and construction phases, especially in northern New England where many open burning dumps are being closed down.

The city of Auburn, Maine will shortly be negotiating with a systems vendor for a full service contract to design, construct, and operate a steam generating plant using modular incineration. Pittsfield and Northampton, Massachusetts and Windham, Connecticut also have facilities in various stages of planning.

The planning and implementation activities for large scale resource recovery facilities are increasing dramatically in the three southern New England states. In Connecticut, construction of the Greater Bridgeport facility is nearing completion with two more facilities being planned for the Hartford metropolitan area and a regional facility at New Haven. The Rhode Island Solid Waste Management Corporation is completing review of three proposals for a co-disposal facility to satisfy the municipal solid waste needs of the entire state. Massachusetts is soliciting towns to contract with Universal Oil Products, Inc. for a 3,000 ton-per-day facility in North Andover. The state is also in various stages of implementation for facilities to serve the needs of west suburban Boston, the greater Worcester area, and the greater Springfield area.

Three New England states now have container legislation, with the recent passage of the Connecticut Bills on Bottles and Litter following the example of Vermont and Maine. The Massachusetts bill was narrowly defeated, but is expected to be raised for consideration again in this new legislative year.

The John F. Kennedy Federal Building high-grade office paper recycling program has been in operation for one year. During the past year about 811 tons of high grade paper have been recycled returning approximately $4,200 to the government and saving nearly $2,000 in annual waste disposal costs. Two additional federal buildings located in Boston will begin office paper recycling programs this year.

TABLE 1 COMPARISON OF PSI VALUES WITH POLLUTANT CONCENTRATIONS, DESCRIPTOR WORDS GENERALIZED HEALTH EFFECTS, AND CAUTIONARY STATEMENTS

INDEX VALUE	AIR QUALITY LEVEL	POLLUTANT LEVELS					HEALTH EFFECT DESCRIPTOR	GENERAL HEALTH EFFECTS	CAUTIONARY STATEMENTS
		TSP (24-hour), $\mu g/m^3$	SO_2 (24-hour), $\mu g/m^3$	CO (8-hour), mg/m^3	O_3 (1-hour), $\mu g/m^3$	NO_2 (1-hour), $\mu g/m^3$			
500	SIGNIFICANT HARM	1000	2620	57.5	1200	3750	HAZARDOUS	Premature death of ill and elderly. Healthy people will experience adverse symptoms that affect their normal activity.	All persons should remain indoors keeping windows and doors closed. All persons should minimize physical exertion and avoid traffic.
400	EMERGENCY	875	2100	46.0	1000	3000		Premature onset of certain diseases in addition to significant aggravation of symptoms and decreased exercise tolerance in healthy persons.	Elderly and persons with existing diseases should stay indoors and avoid physical exertion. General population should avoid outdoor activity.
300	WARNING	625	1600	34.0	800	2260	VERY UNHEALTHFUL	Significant aggravation of symptoms and decreased exercise tolerance in persons with heart or lung disease, with widespread symptoms in the healthy population.	Elderly and persons with existing heart or lung disease should stay indoors and reduce physical activity.
200	ALERT	375	800	17.0	400[c]	1130	UNHEALTHFUL	Mild aggravation of symptoms in susceptible persons, with irritation symptoms in the healthy population.	Persons with existing heart or respiratory ailments should reduce physical exertion and outdoor activity.
100	NAAQS	260	365	10.0	160	a	MODERATE		
50	50% OF NAAQS	75[b]	80[b]	5.0	80	a	GOOD		
0		0	0	0	0	a			

[a]No index values reported at concentration levels below those specified by "Alert Level" criteria.

[b]Annual primary NAAQS.

[c]400 $\mu g/m^3$ was used instead of the O_3 Alert Level of 200 $\mu g/m^3$

FIGURE 1

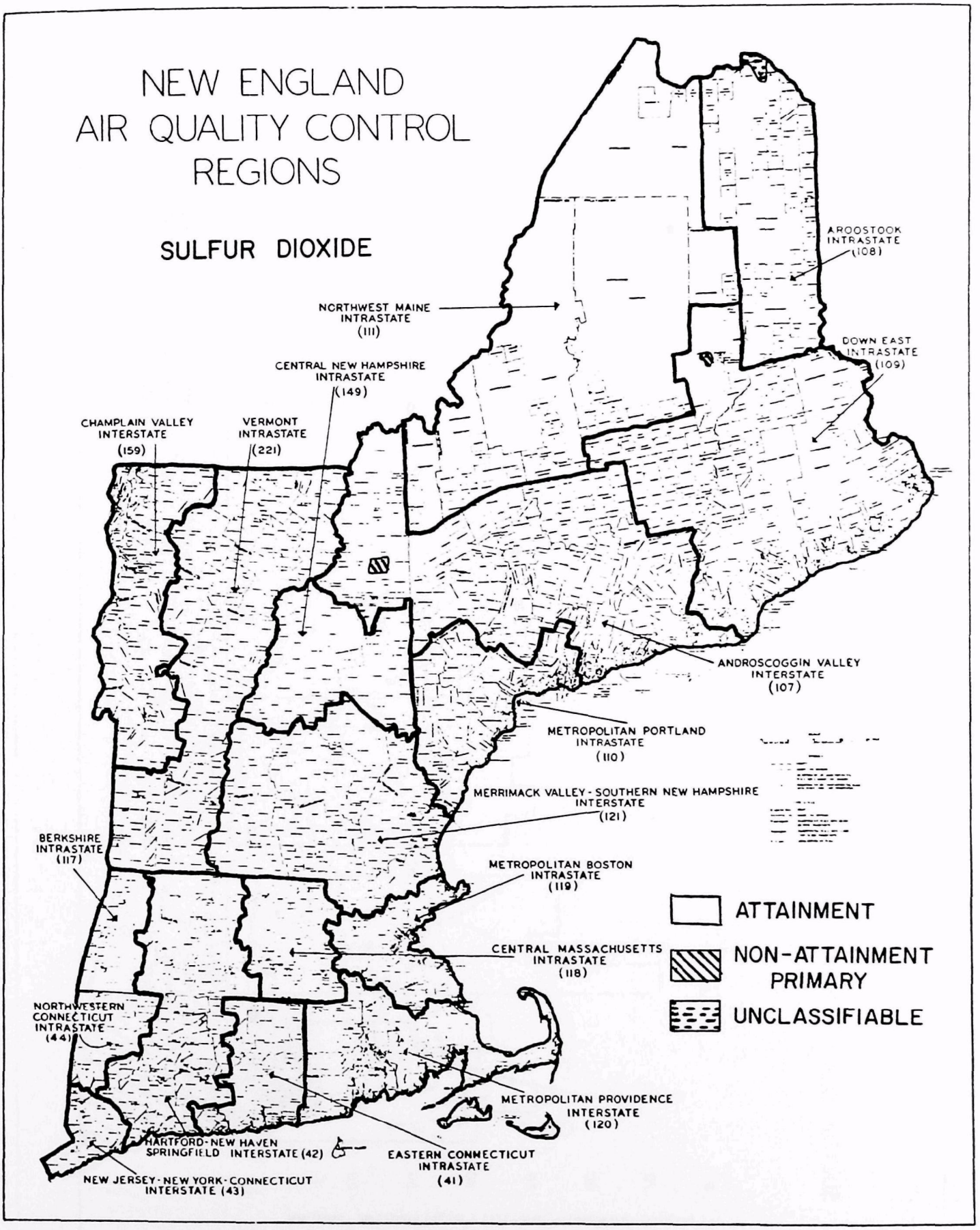

NEW ENGLAND
AIR QUALITY CONTROL
REGIONS
SULFUR DIOXIDE
AROOSTOOK INTRASTATE (108)
NORTHWEST MAINE INTRASTATE (111)
DOWN EAST INTRASTATE (109)
CENTRAL NEW HAMPSHIRE INTRASTATE (149)
CHAMPLAIN VALLEY INTERSTATE (159)
VERMONT INTRASTATE (221)
ANDROSCOGGIN VALLEY INTERSTATE (107)
METROPOLITAN PORTLAND INTRASTATE (110)
MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE (121)
BERKSHIRE INTRASTATE (117)
METROPOLITAN BOSTON INTRASTATE (119)
CENTRAL MASSACHUSETTS INTRASTATE (118)
NORTHWESTERN CONNECTICUT INTRASTATE (44)
METROPOLITAN PROVIDENCE INTERSTATE (120)
HARTFORD-NEW HAVEN SPRINGFIELD INTERSTATE (42)
EASTERN CONNECTICUT INTRASTATE (41)
NEW JERSEY-NEW YORK-CONNECTICUT INTERSTATE (43)
ATTAINMENT
NON-ATTAINMENT PRIMARY
UNCLASSIFIABLE

TABLE 2.

SULFUR DIOXIDE-ANNUAL AVERAGE MAXIMUM 24 HOURLY LEVELS TRENDS 1974-1977

NEW ENGLAND SITES

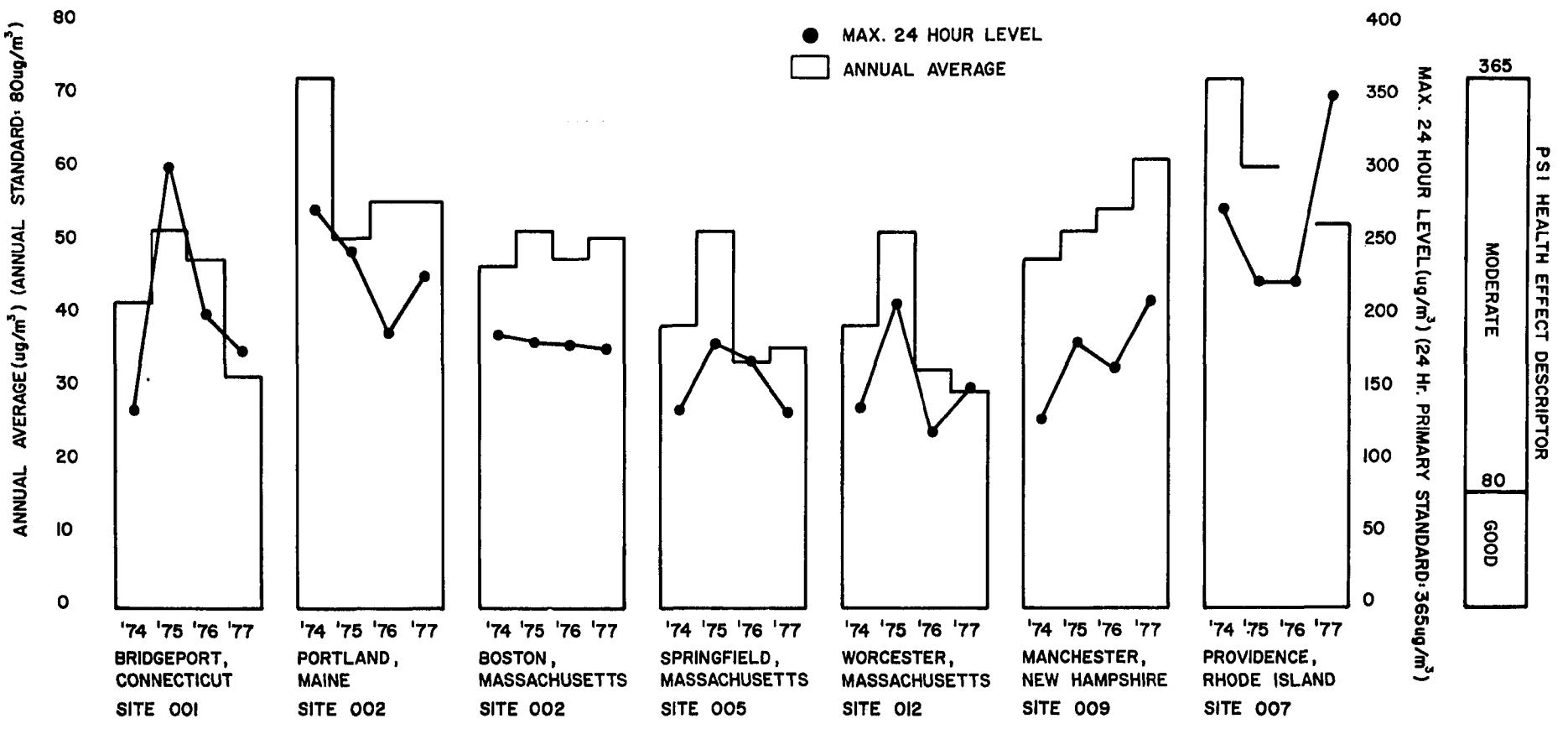


FIGURE 2

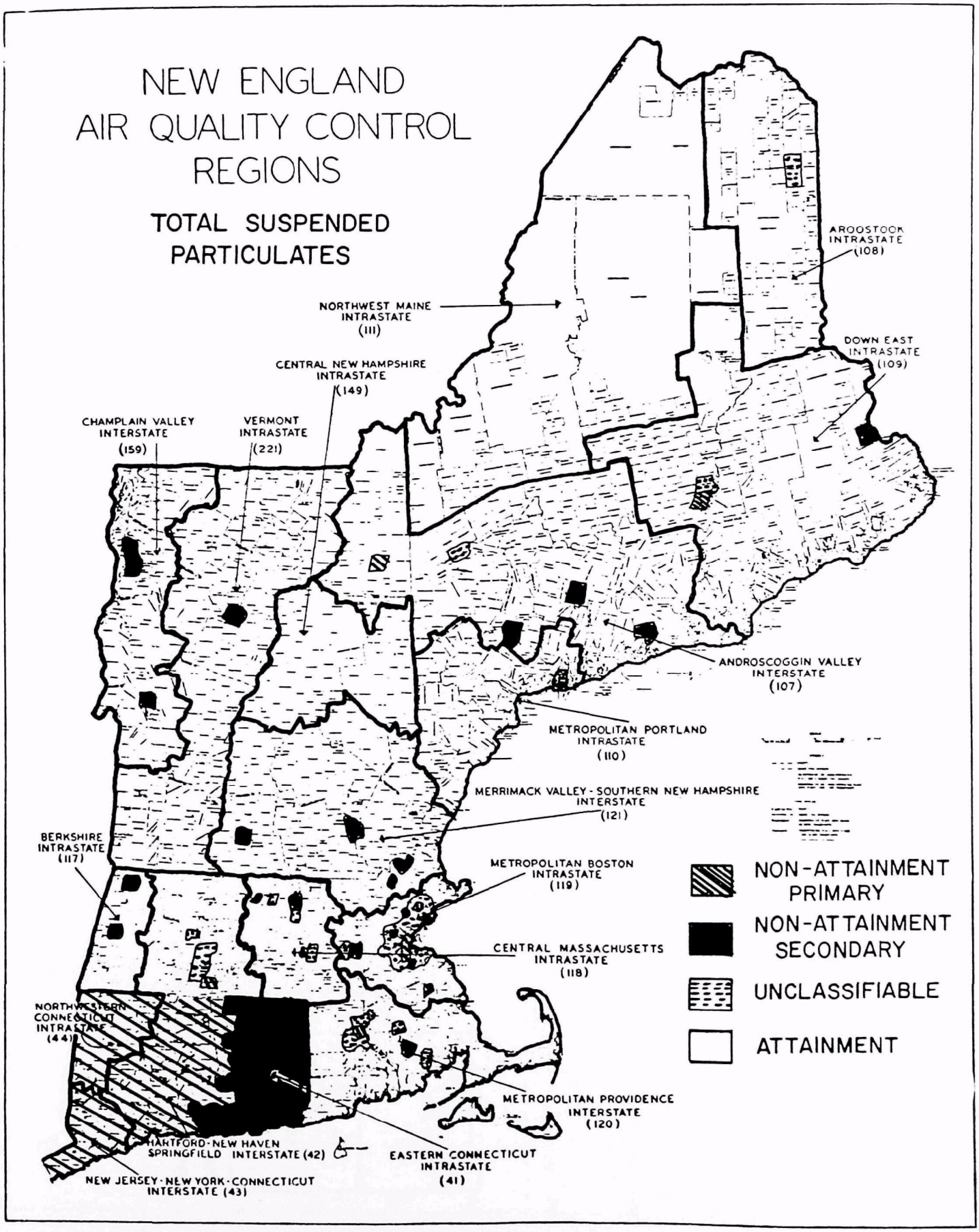

NEW ENGLAND
AIR QUALITY CONTROL
REGIONS
TOTAL SUSPENDED
PARTICULATES
AROOSTOOK INTRASTATE (108)
NORTHWEST MAINE INTRASTATE (111)
DOWN EAST INTRASTATE (109)
CENTRAL NEW HAMPSHIRE INTRASTATE (149)
CHAMPLAIN VALLEY INTERSTATE (159)
VERMONT INTRASTATE (221)
ANDROSCOGGIN VALLEY INTERSTATE (107)
METROPOLITAN PORTLAND INTRASTATE (110)
MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE (121)
BERKSHIRE INTRASTATE (117)
METROPOLITAN BOSTON INTRASTATE (119)
CENTRAL MASSACHUSETTS INTRASTATE (118)
NORTHWESTERN CONNECTICUT INTRASTATE (44)
METROPOLITAN PROVIDENCE INTERSTATE (120)
HARTFORD-NEW HAVEN SPRINGFIELD INTERSTATE (42)
EASTERN CONNECTICUT INTRASTATE (41)
NEW JERSEY-NEW YORK-CONNECTICUT INTERSTATE (43)
NON-ATTAINMENT PRIMARY
NON-ATTAINMENT SECONDARY
UNCLASSIFIABLE
ATTAINMENT

TABLE 3.

TOTAL SUSPENDED PARTICULATES-ANNUAL GEOMETRIC MEAN - TRENDS 1974 - 1977

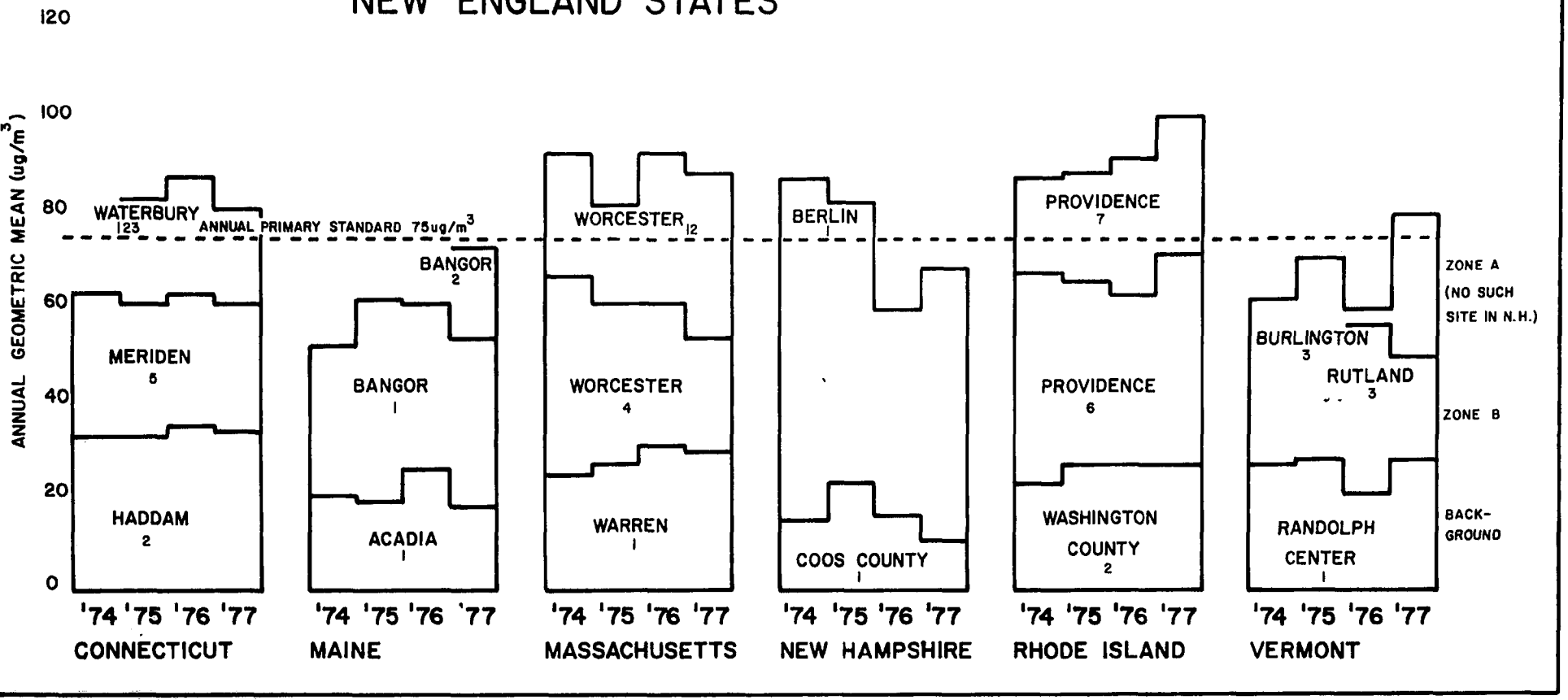


FIGURE 3

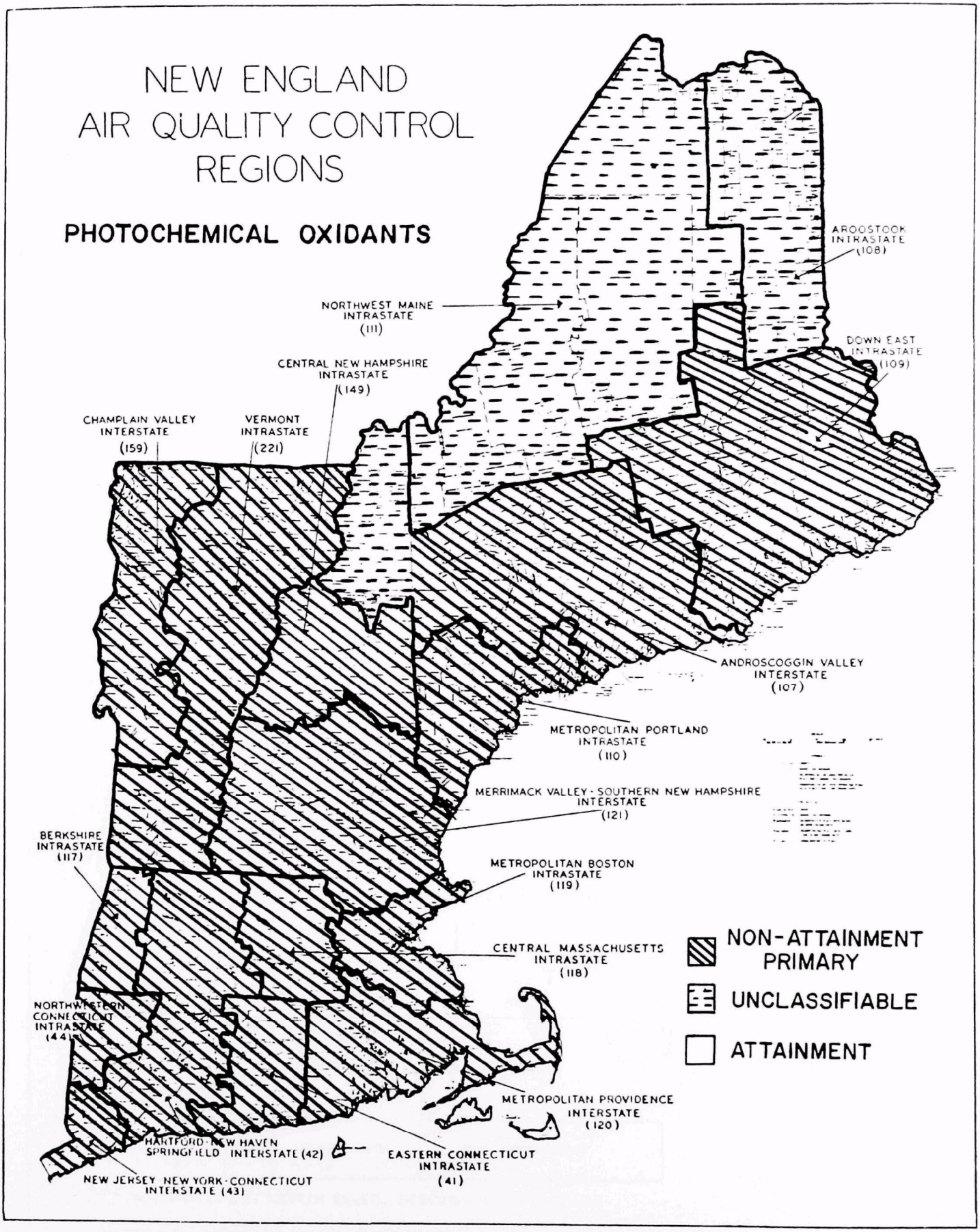

NEW ENGLAND
AIR QUALITY CONTROL
REGIONS
PHOTOCHEMICAL OXIDANTS
AROOSTOOK INTRASTATE (108)
NORTHWEST MAINE INTRASTATE (111)
DOWN EAST INTRASTATE (109)
CENTRAL NEW HAMPSHIRE INTRASTATE (149)
CHAMPLAIN VALLEY INTERSTATE (159)
VERMONT INTRASTATE (221)
ANDROSCOGGIN VALLEY INTERSTATE (107)
METROPOLITAN PORTLAND INTRASTATE (110)
MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE (121)
BERKSHIRE INTRASTATE (117)
METROPOLITAN BOSTON INTRASTATE (119)
CENTRAL MASSACHUSETTS INTRASTATE (118)
NORTHWESTERN CONNECTICUT INTRASTATE (44)
METROPOLITAN PROVIDENCE INTERSTATE (120)
HARTFORD - NEW HAVEN SPRINGFIELD INTERSTATE (42)
EASTERN CONNECTICUT INTRASTATE (41)
NEW JERSEY NEW YORK - CONNECTICUT INTERSTATE (43)
NON-ATTAINMENT PRIMARY
UNCLASSIFIABLE
ATTAINMENT

TABLE 4.

OZONE-MAXIMUM LEVEL, VIOLATION FREQUENCY-ONE HR. STANDARD TRENDS 1974-1977

NEW ENGLAND SITES

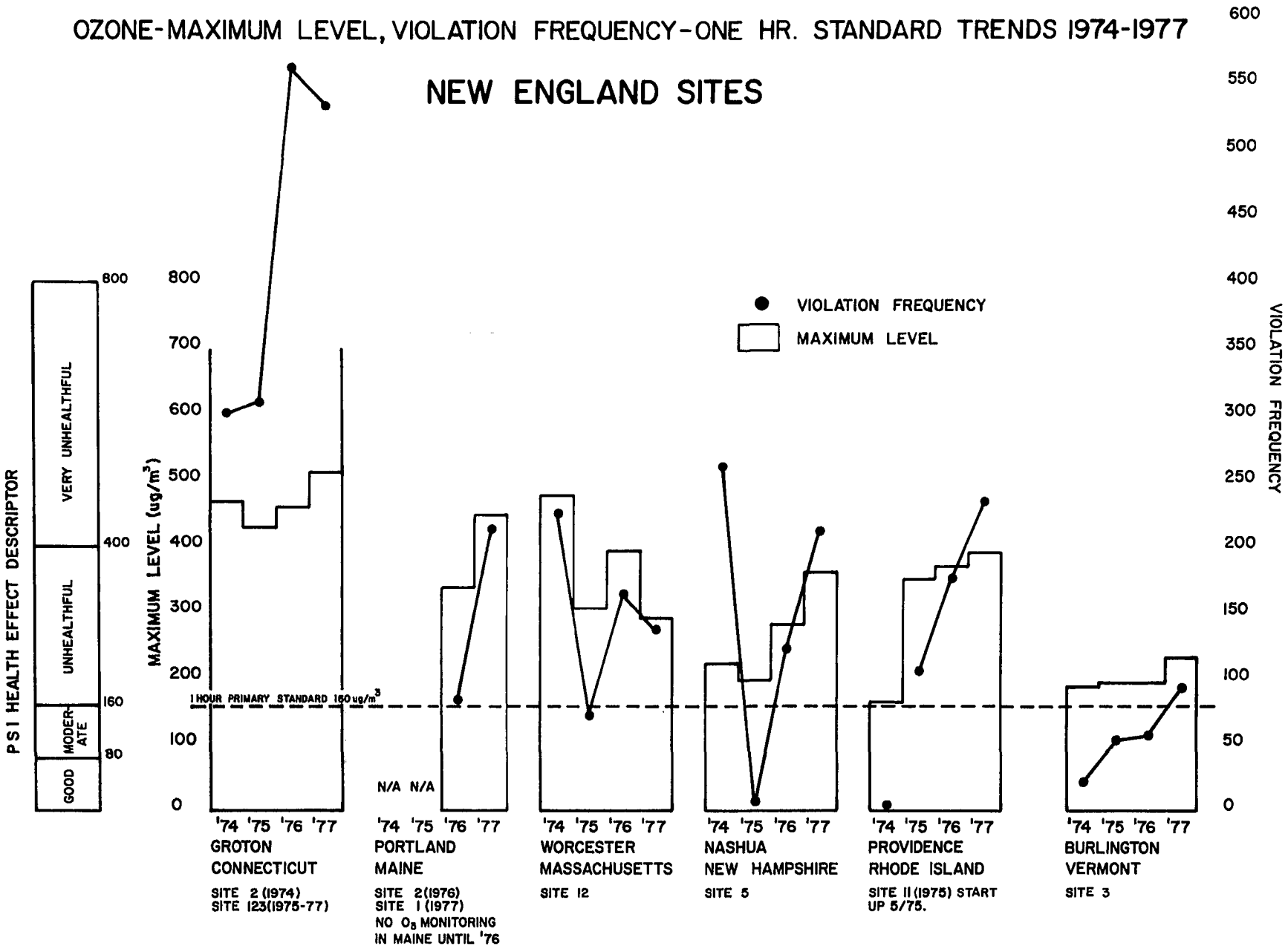


FIGURE 4

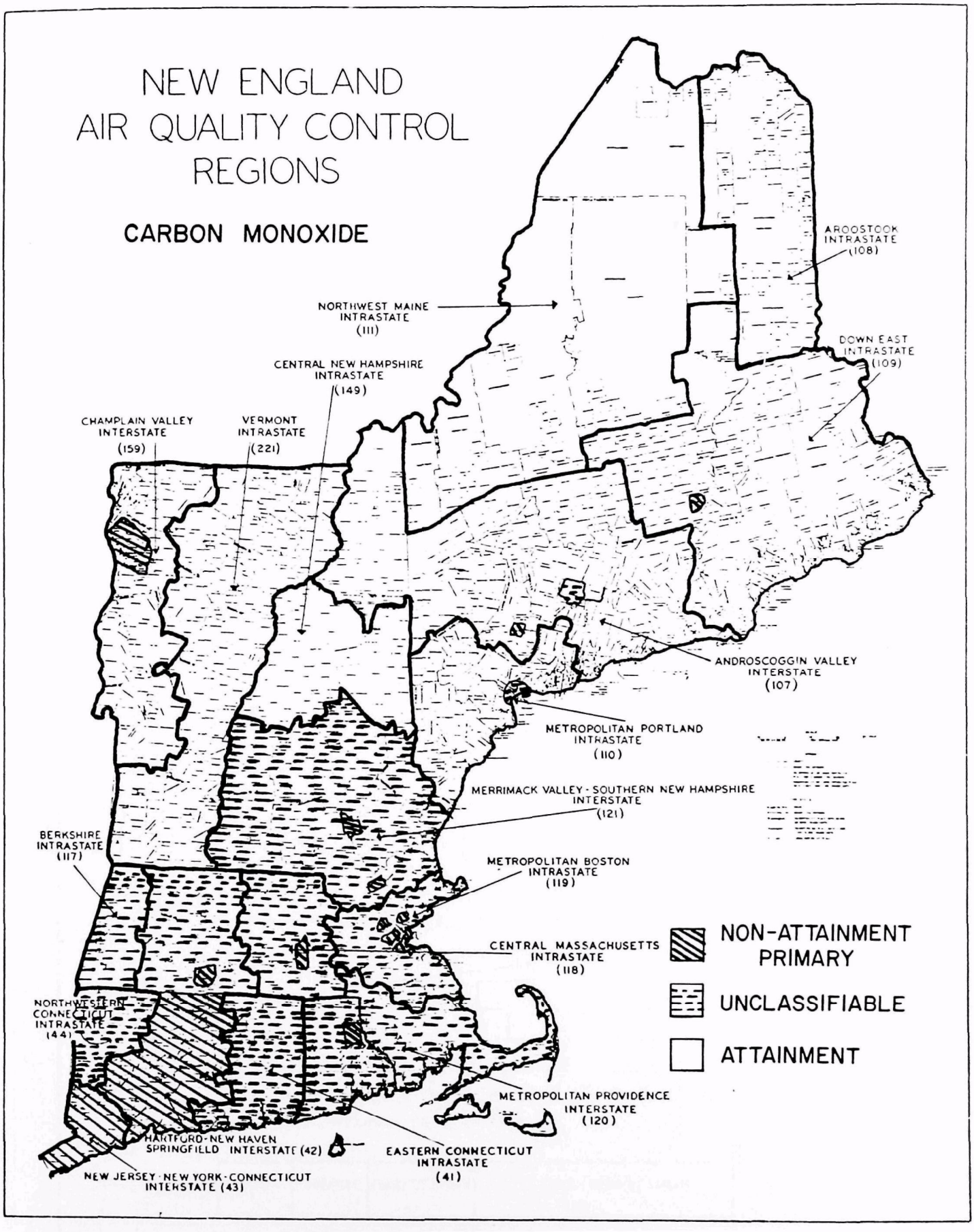

NEW ENGLAND
AIR QUALITY CONTROL
REGIONS
CARBON MONOXIDE
AROOSTOOK INTRASTATE (108)
NORTHWEST MAINE INTRASTATE (111)
DOWN EAST INTRASTATE (109)
CENTRAL NEW HAMPSHIRE INTRASTATE (149)
CHAMPLAIN VALLEY INTERSTATE (159)
VERMONT INTRASTATE (221)
ANDROSCOGGIN VALLEY INTERSTATE (107)
METROPOLITAN PORTLAND INTRASTATE (110)
MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE (121)
BERKSHIRE INTRASTATE (117)
METROPOLITAN BOSTON INTRASTATE (119)
CENTRAL MASSACHUSETTS INTRASTATE (118)
NORTHWESTERN CONNECTICUT INTRASTATE (44)
METROPOLITAN PROVIDENCE INTERSTATE (120)
HARTFORD-NEW HAVEN SPRINGFIELD INTERSTATE (42)
EASTERN CONNECTICUT INTRASTATE (41)
NEW JERSEY - NEW YORK - CONNECTICUT INTERSTATE (43)
NON-ATTAINMENT PRIMARY
UNCLASSIFIABLE
ATTAINMENT

TABLE 5.

CARBON MONOXIDE-MAXIMUM LEVEL, VIOLATION FREQUENCY-EIGHT HOUR STANDARD TRENDS 1974-1977

NEW ENGLAND SITES

(VILOATION FREQUENCY NOT CALCULATED IN 1974)

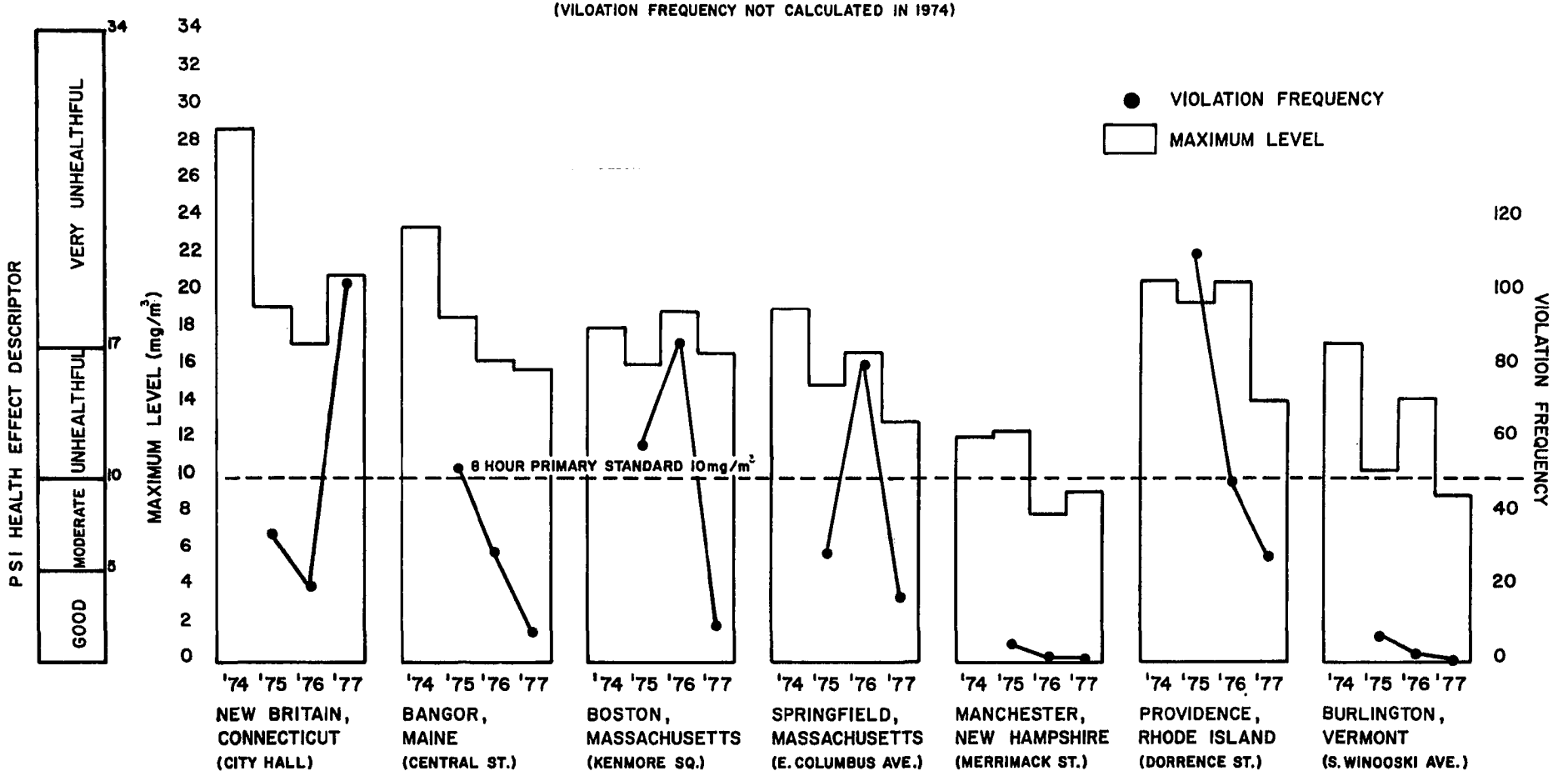


FIGURE 5

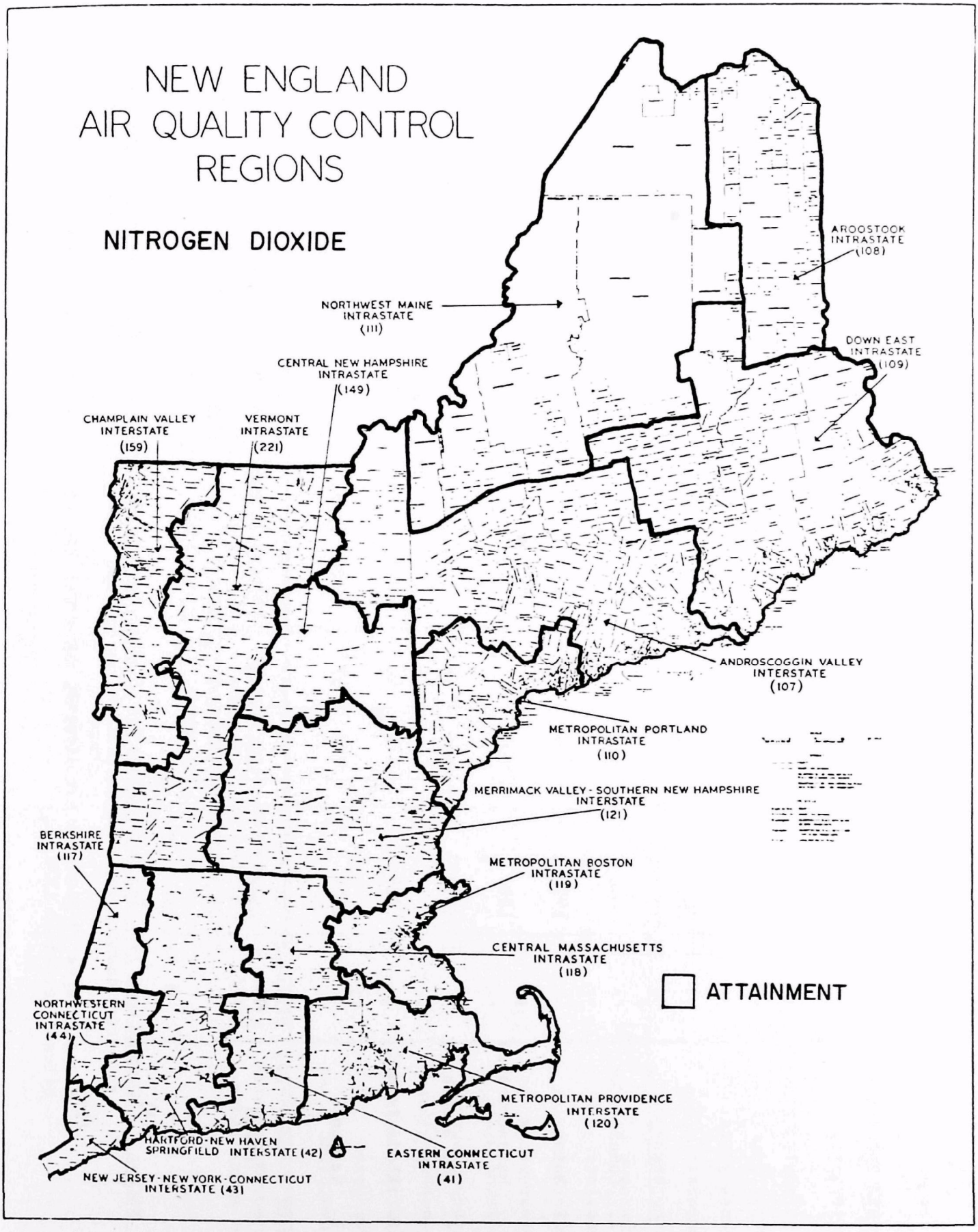

NEW ENGLAND
AIR QUALITY CONTROL
REGIONS
NITROGEN DIOXIDE
AROOSTOOK INTRASTATE (108)
NORTHWEST MAINE INTRASTATE (111)
DOWN EAST INTRASTATE (109)
CENTRAL NEW HAMPSHIRE INTRASTATE (149)
CHAMPLAIN VALLEY INTERSTATE (159)
VERMONT INTRASTATE (221)
ANDROSCOGGIN VALLEY INTERSTATE (107)
METROPOLITAN PORTLAND INTRASTATE (110)
MERRIMACK VALLEY - SOUTHERN NEW HAMPSHIRE INTERSTATE (121)
BERKSHIRE INTRASTATE (117)
METROPOLITAN BOSTON INTRASTATE (119)
CENTRAL MASSACHUSETTS INTRASTATE (118)
ATTAINMENT
NORTHWESTERN CONNECTICUT INTRASTATE (44)
METROPOLITAN PROVIDENCE INTERSTATE (120)
HARTFORD-NEW HAVEN SPRINGFIELD INTERSTATE (42)
EASTERN CONNECTICUT INTRASTATE (41)
NEW JERSEY-NEW YORK-CONNECTICUT INTERSTATE (43)

TABLE 6

NEW ENGLAND SUMMARY - Main Stem and Major Tributary River Mileage
Meeting Fishable/Swimmable Goals of the Clean Water Act

State	Miles Assessed	Miles Meeting Class "B" Fishable/Swimmable Goals						% Change		
		1978 Miles	%	1977 Miles	%	1976 Miles	%	76-78	76-77	77-78
1. Connecticut (1)	448	189 -	42	185	41	151	34	+ 8	+ 7	+ 1
2. Maine	1930	1204	62	1204	62	1151	60	+ 3	+ 3	0
3. Massachusetts (2)	1684	594	35	410	28	356	24	+11	+ 4	+ 7
4. New Hampshire	1298	669	52	591	46	562	43	+ 9	+ 3	+ 6
5. Rhode Island	329	211	64	211	64	211	64	0	0	0
6. Vermont	1109	747	67	686	62	686	62	+ 5	0	+ 5
TOTALS	6798	3614	53%	3287	48%	3117	46%	+ 7%	+ 2%	+ 5%

Notes: (1) Connecticut 1977 and 1976 values modified to include Willimantic and Park Rivers not previously reported; downgrading of Housatonic River was due to discovery of PCB's in fish and sediments.

(2) Massachusetts 1978 values not directly comparable to 1977 and 1976 due to increased number of miles assessed in 1978.

TABLE 7

SUMMARY OF WATER QUALITY
State of Connecticut

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Connecticut River	69	23	23	23	46	3,6	M, I, CS, NPS
Park River	12	2	7	2	10	2,5,6	CS, NPS
Farmington River	54	54	54	54	0	-	M
Pequabuck River	15	3	15	3	12	2,5,6	M,I,NPS
French River	6	0	1	0	6	2,5,6	M, I
Hockanum River	17	2	17	2	15	2,3,5,6	M,I,NPS
Housatonic River	80	29	33	29	51	1,3,6	M,I,NPS, CS
Naugatuck River	35	20	20	20	15	1,2,4,5,6	M,I,CS,NPS
Pawcatuck River	11	0	11	0	11	2,5,6	M,I,
Quinebaug River	42	0	26	0	42	2,5,6	M,I,NPS
Quinnipiac River	34	7	30	7	27	2,3,5	M,NPS
Shetucket River	18	15	18	15	3	2,6	M,CS,NPS
Thames River	17	0	10	0	17	2,3,5	M,I,CS,NPS
Yantic River	11	7	11	7	4	5,6	I,CS
Willimantic River	27	27	27	27	0	-	M,NPS
Total Miles	448	189	303	189	259		
Percent of Miles Assessed		42%	68%	42%	58%		

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of Maine

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Androscoggin River	320	150	314	314	6	1,2,5,6	M,I,CS
Mousam River	23	5	11	11	12	3,5,6	M,CS
Kennebec River	325	200	271	271	54	1,2,5	M,I,CS
Penobscot River	379	180	362	362	17	2,5	M,I
Presumpscot River	58	21	51	51	7	2,5,6	M,I, CS
Saco	230	212	227	227	3	1,5,6	M,I
Salmon Falls (Piscataqua)	157	120	157	157	0	5,6	M
St. Croix River	87	47	77	77	10	2,5,6	M,I,CS
St. John River	351	269	323	323	28	2,5,6	M,I, NPS
Total Miles	1930	1204	1793	1793	137		
Percent of Miles Assessed		62%	93%	93%			

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of Massachusetts

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Blackstone River	201	101	185	111	90	1,2,3,5,6	M,I,CS
Boston Harbor						1,2,3,5,6	M,I,CS,NPS
Mystic River)	20	0	18	1	19		
Neponset River)	22	0	22	7	15		
Buzzards Bay	45	17	41	37	8	1,5,6	M,I,CS
Charles River	90	1	51	1	88	1,2,3,5,6	M,I,CS,NPS
Chicopee River	111	45	102	72	39	2,3,5,6	M,I,CS
Connecticut River	82	32	66	32	50	1,2,3,5,6	M,I,CS
Deerfield River	80	68	80	68	12	2,6	M
Farmington River	18	18	18	18	0	-	NPS
French-Quinebaug	57	20	53	29	28	2,3,5,6	M,I,NPS
Hoosic	39	17	39	20	19	1,2,3,5,6	M,I,NPS
Housatonic	96	56	40	56	40	1,3,5,6	M,I,NPS
Ipswich & Parker	71	0	71	0	71	6	M,NPS
Merrimack	115	4	86	0	115	2,3,5,6	M,I,CS
Millers	57	17	57	17	40	2,5,6	M,I
Nashua	108	10	88	10	98	2,3,5,6	M,I,CS,NPS

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of Massachusetts (Continued)

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
North River	22	13	22	13	9	1,2,5,6	M,NPS
SuAsCo (Sudbury, Assabet, Concord	88	1	78	1	87	3,5,6	M,NPS
Taunton River	203	100	203	100	103	1,2,3,5,6	M,I,CS,NPS
Ten Mile River	38	4	38	4	34	1,2,3,5,6	M,I,NPS
Westfield River	121	69	121	73	48	2,3,5,6	M,I,NPS
Total Miles	1684	594	1479	671	1013		
Percent of Miles Assessed		35%	88%	40%	60%		

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of New Hampshire

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Androscoggin River	65	42	50	42	23	2,6	M,I,CS
Connecticut River	394	123	386	123	271	2,5,6	M,I,CS
Ashuelot River	76	36	66	36	40	2,6	M,I,CS,NPS
Merrimack River	488	284	463	281	207	2,5,6	M,I,CS
Piscataqua River & Coastal Basins	181	90	181	90	91	2,5,6	M,I,CS
Saco	94	94	94	94	0	-	-
Total Miles	1298	669	1240	666	632		
Percentage of Miles Assessed		52%	96%	51%	49%		

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of Rhode Island

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industrial CS= Combined Sewers NPS = Nonpoint Source
Blackstone River	89	48	55	82	7	5,6	M,I,CS
Moosup River	25	25	25	25	0	-	-
Moshassuck River	17	8	10	14	3	5,6	M,CS,NPS
Pawcatuck River	115	94	103	111	4	5,6	M,I
Pawtuxet River	60	28	30	56	3	5,6	M,I
Woonasquatucket R.	23	8	16	20	3	5,6	M,CS,NPS
Estuarine Areas & Salt Ponds (Acres)	117,764 Acres	108,555 Acres	112,270 Acres	107,653 Acres	10,111 Acres	6	M,I,NPS,CS
Total Miles	329	211	239	308	20		
Percent of Miles Assessed		64%	73%	94%	6%		

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

SUMMARY OF WATER QUALITY
State of Vermont

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Battenkill, Walloomsac, Hoosic Rivers	44	29	43	29	15	2,6	M, I, CS
Poultney, Mettawee Rivers	44	28	44	41	3	6	M, NPS
Otter Creek	86	70	76	80	6	5,6	M, CS
Lake Champlain Tributaries	25	19	23	23	2	2,3,5,6	M, CS
Missiquoi River	93	70	92	76	17	5,6	M, I, CS
Lamoille River	90	64	88	73	17	2,6	M, CS, NPS
Winooski River	115	60	95	101	14	2,3,5,6	M, I, CS
White River	69	57	68	59	10	6	M, I
Ottaquechee, Black Rivers	65	35	56	42	23	6	M, I, CS
West, Williams, Saxtons Rivers	76	71	74	74	2	6	M
Deerfield River	34	24	34	24	10	6	M
Connecticut River	238	153	230	172	66	5,6	M, I, NPS
Stevens, Wells, Waits Rivers	16	5	12	5	11	1,5,6	M, NPS

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

TABLE 7

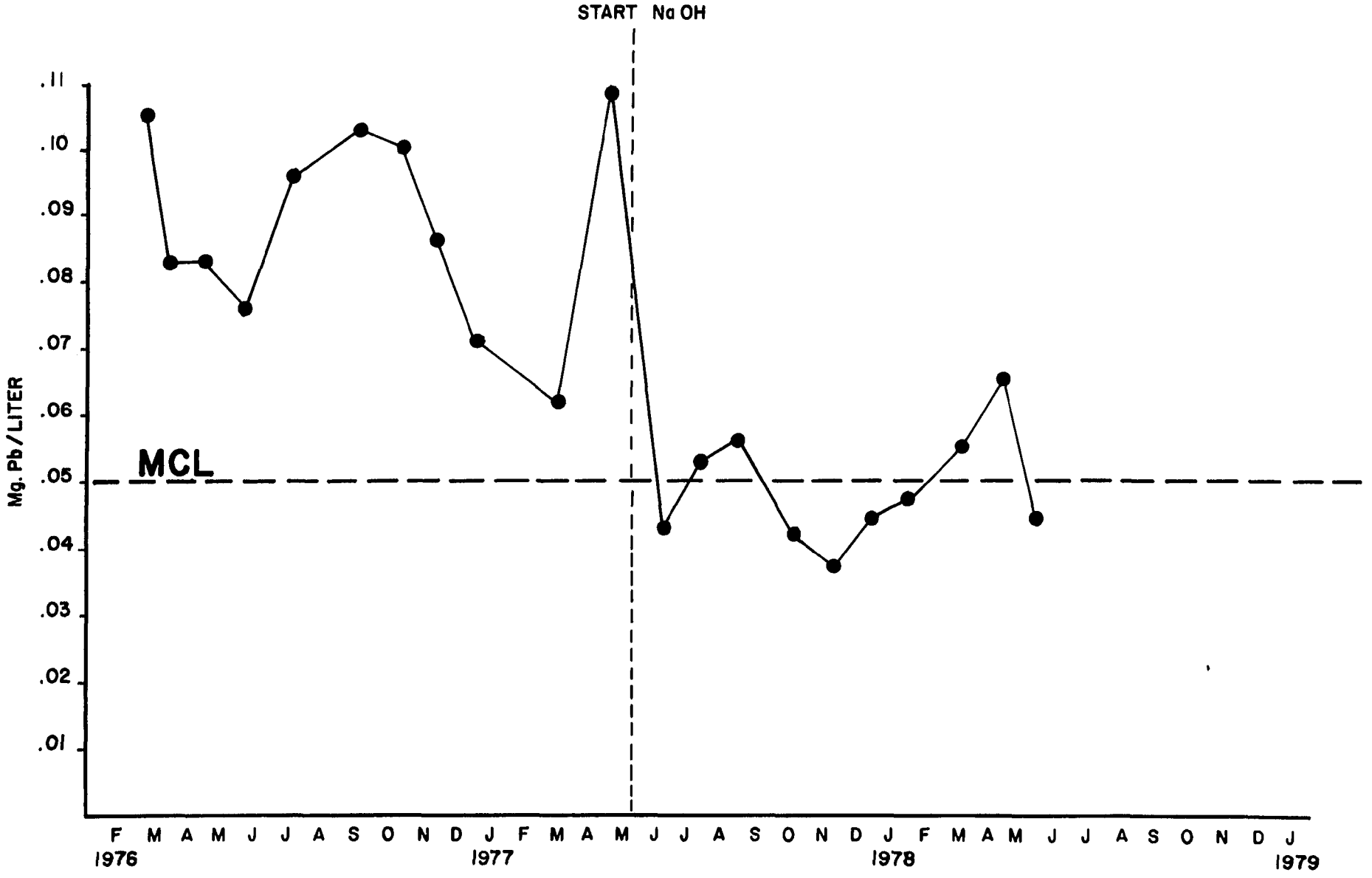
SUMMARY OF WATER QUALITY
State of Vermont (Continued)

Major Water Areas (including mainstem & major tributaries)	Total Miles Assessed	Miles now meeting Class B (fishable/ swimmable) standards or better	Miles expected to be Class B or better by 1983	Miles now meeting State water quality standards	Miles not meeting State water quality standards	*Water quality problems	Source of Water Quality Problems M= Municipal I= Industiral CS= Combined Sewers NPS = Nonpoint Source
Passumpsic River	47	15	45	25	22	5,6	M, I, CS
Lake Memphremagog, Black, Barton, Clyde Rivers	67	47	65	48	19	2,3,6	M, NPS, CS
Total Miles	1109	747	1045	872	237		
Percent of Miles Assessed		67%	94%	79%	21%		

*Water quality problems
1. Harmful Substances; 2. Physical Modification (Suspended Solids, Temp., etc.);
3. Eutrophication potential; 4. Salinity, acidity, alkalinity;
5. Oxygen depletion; 6. Health Hazards-(coliform)

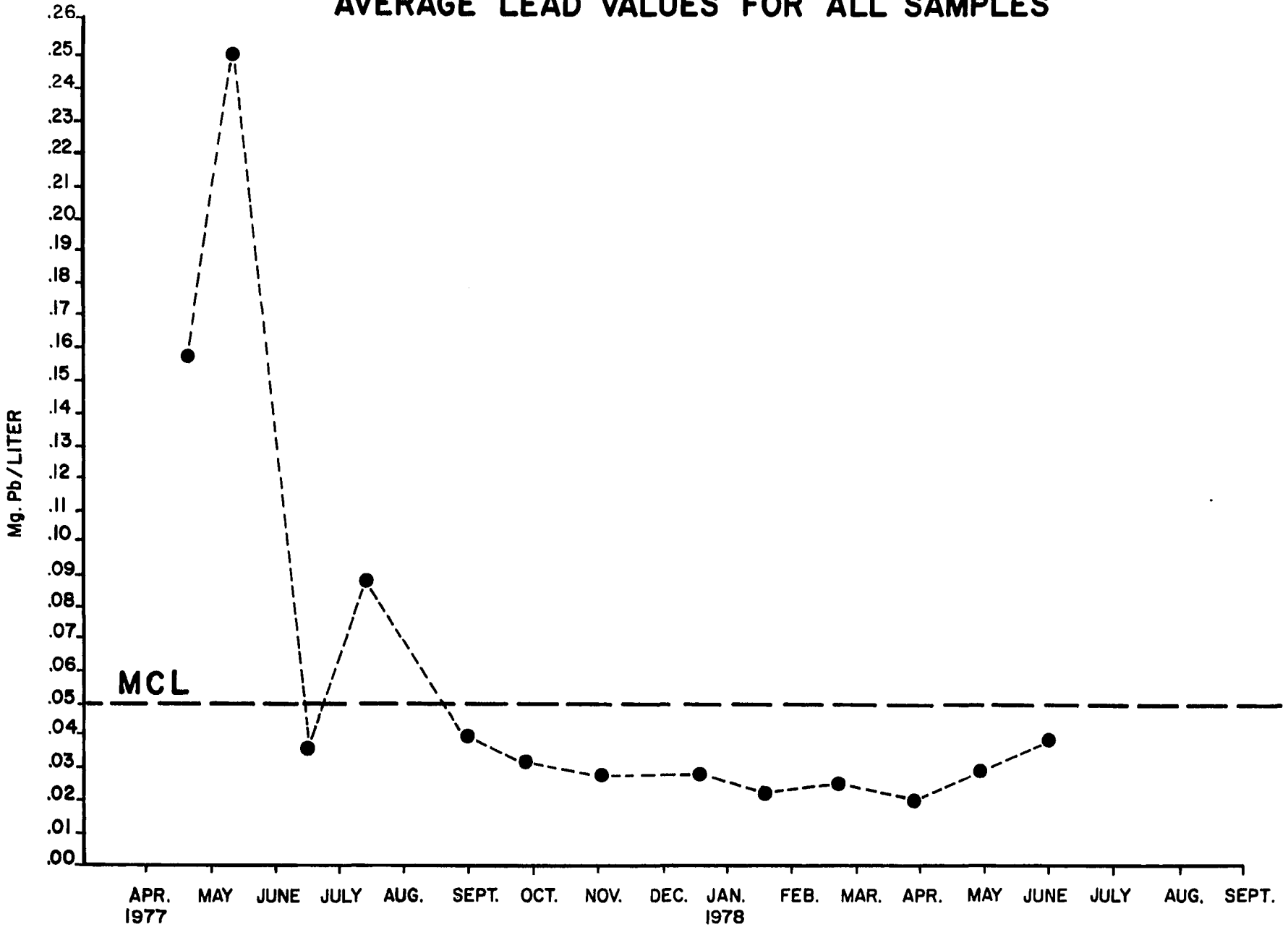
GRAPH 1

MDC LEAD MONITERING STUDY—AVERAGE LEAD CONCENTRATION IN 18-23 HOMES IN BOSTON, MASS. AND SOMERVILLE, MASS.



GRAPH 2

BENNINGTON, VT. LEAD MONITORING STUDY
AVERAGE LEAD VALUES FOR ALL SAMPLES



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