NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION:

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

To The Governors of:

CONNECTICUT
MASSACHUSETTS
NEW HAMPSHIRE
VERMONT

MAINE
NEW YORK
RHODE ISLAND

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NEW ENGLAND INTERSTATE
WATER POLLUTION CONTROL COMMISSION

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ANNUAL REPORT

on

INTERSTATE WATER POLLUTION CONTROL

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COVER
The postage stamp reproduced on the cover of this report was issued by the Post Office Department in April 1950. Its issuance was to dramatize the fact that water is our most precious natural resource and that every effort should be made through pollution control and other means to conserve the Nation's waters.
FACTS ABOUT NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMPACT

Today the Nation is water-conscious and the New England area is no exception. Interest in the conservation of the water resources of this renowned industrial and recreational region, through effective pollution control, has become one of paramount public concern.

WHY Was NEIWPCC Needed?

The New England region is virtually a network of rivers crossing State lines and in several instances forming the boundaries between States. Thus, as the individual States endeavored to carry out pollution control programs, it became more and more apparent that a coordinated interstate program was essential to a sound and equitable solution of the problem. After considerable discussion and planning, an interstate compact providing for cooperation by the States was selected as the most logical and effective approach.

In 1947 the New England Interstate Water Pollution Control Compact was approved by an act of Congress and ratified by the legislatures of Connecticut, Massachusetts and Rhode Island. New York, which was eligible to become a signatory because of interstate waters common with the New England area, ratified the Compact in 1949. Vermont and New Hampshire became signatories in 1951 and the roster of eligible States was completed by Maine's ratification of the Compact in 1955.

WHO Administers NEIWPCC?

The Compact is administered by the New England Interstate Water Pollution Control Commission composed of five members from each signatory State including the administrative head of the State's pollution control program. An important part of the Commission organization is the Technical Advisory Board which consists of the directors of the State pollution control agencies. The Board carries out the technical phases of the program and prepares recommendations for Commission consideration and action. The operations of the Commission are financed by annual appropriations from the signatory States.

WHAT Does NEIWPCC Do?

The Compact provides for the abatement of existing pollution and the control of future pollution of interstate inland and tidal waters.

Recognizing the necessity of a balanced use of the area's waters to meet the various degrees of water quality required for the proper maintenance of the social and economic well-being of the region, the Compact sets up a procedure for classifying interstate waters according to highest use. This classification system is based on accepted water quality standards and reconciles the conflict of water uses by the assignment of classifications which will best serve all interests concerned.

The Commission has no authority to issue orders for pollution abatement. Such powers are retained by the individual States and used when needed to enforce classification requirements. The role of the New England Interstate Water Pollution Control Commission is to promote, formulate and conduct a sound and integrated program for the complete utilization of the interstate waters of the region. Through the medium of interstate cooperation, the Commission is successfully conducting a long-range program to resolve a regional problem which the States are incapable of doing individually.

HOW Does NEIWPCC Work?

The Compact, approved by Congress and ratified by the legislatures of the seven States, is the legal instrument for cooperation between the States in interstate water pollution control. Under the terms of the Compact each State agrees to submit classifications of its interstate waters to the Commission for approval. Each State further agrees to establish programs of treatment of sewage and industrial wastes to bring about the improvements required to meet the approved classifications.

While the principal function delegated to the Commission is the approval of classifications for interstate waters, its interests encompass a broad range of activities associated with many phases of water pollution control. Included in these activities are public relations, legislation, programs for planning, financing and constructing waste treatment facilities, pollution abatement programs, surveys, investigations and research, and cooperation with other water resources agencies on local, State and Federal levels.
POLLUTION CONTROL PROGRAMS

CLASSIFICATION OF WATERS

The principal function assigned the Commission under the terms of the Compact is the approval of classifications for the interstate inland and tidal waters of the 7-State Compact area. The classification system established by the Commission permits a balanced use of the area's waters to meet the various degrees of water quality required. The classes of water usage and the corresponding physical, chemical and bacteriological standards employed in the classification determinations are herein reproduced.

In ratifying the Compact each State agreed to prepare classifications of its interstate waters according to present and proposed highest use and to submit them to the Commission for approval. It was further agreed that upon approval each State, acting through its water pollution control agency and under its laws, would establish programs for the treatment of sewage and industrial wastes deemed necessary for compliance with the classifications.

To coordinate and facilitate the preparation of proposed interstate water classifications by the States, subcommittees of the Technical Advisory Board are established by the Commission for each of the interstate river basins and tidal areas. Each subcommittee is composed of the Board members from the States included in the basin or area. Coordinated sampling programs and sanitary and industrial waste surveys are arranged by each subcommittee to obtain the necessary data for classification preparation.

The accompanying table shows the status of classification of interstate waters in the Compact area.

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

CLASSIFICATION AND STANDARDS OF QUALITY FOR INTERSTATE WATERS
(As Revised and Adopted October 1, 1959)

<table>
<thead>
<tr>
<th>SUITABILITY FOR USE</th>
<th>CLASS A</th>
<th>CLASS B</th>
<th>CLASS C</th>
<th>CLASS D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable for any use. Character uniformly excellent.</td>
<td>Suitable for fishing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value. Acceptable for public water supply with filtration and disinfection.</td>
<td>Suitable for recreational boating, irrigation of crops not used for consumption without cooking; habitat for wildlife and common food and game fishes indigenous to the region; industrial cooling and most industrial process uses.</td>
<td>Suitable for transportation of sewage and industrial wastes without nuisance, and for power, navigation and certain industrial uses.</td>
<td></td>
</tr>
</tbody>
</table>

STANDARDS OF QUALITY

<table>
<thead>
<tr>
<th>Dissolved oxygen</th>
<th>Not less than 75% sat.</th>
<th>Not less than 75% sat.</th>
<th>Not less than 5 p.p.m.</th>
<th>Present at all times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and grease</td>
<td>None</td>
<td>No appreciable amount</td>
<td>Not objectionable</td>
<td>Not objectionable</td>
</tr>
<tr>
<td>Odor, scum, floating solids, or debris</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not objectionable</td>
</tr>
<tr>
<td>Sludge deposits</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not objectionable</td>
</tr>
<tr>
<td>Color and turbidity</td>
<td>None</td>
<td>Not objectionable</td>
<td>Not objectionable</td>
<td>Not objectionable</td>
</tr>
<tr>
<td>Phenols or other taste producing substances</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not objectionable</td>
</tr>
<tr>
<td>Substances potentially toxic</td>
<td>None</td>
<td>None</td>
<td>Not in toxic concentrations or combinations</td>
<td>Not in toxic concentrations or combinations</td>
</tr>
<tr>
<td>Free acids or alkalies</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not in objectionable amounts</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>Within limits approved by the appropriate State agency with consideration of possible adverse effects in downstream waters from discharge of radioactive wastes; limits in a particular watershed to be resolved when necessary after consultation between States involved.</td>
<td>Bacterial content of bathing waters shall meet limits approved by State Department of Health and acceptability will depend on sanitary survey.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coliform bacteria</td>
<td>*Within limits approved by State Department of Health for uses involved.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Sea waters used for the taking of market shellfish shall not have a median coliform count in excess of 70 per 100 ml.

NOTE: Waters falling below these descriptions are considered as unsatisfactory and as Class E. These standards do not apply to conditions brought about by natural causes. For purpose of distinction as to use, waters used or proposed for public water supply shall be so designated.
FARMINGTON RIVER BASIN
(Mass.-Conn.)

The Farmington River rises in west central Massachusetts and is tributary to the Connecticut River above Hartford, Connecticut. Its drainage area contains 602 square miles and includes the tributary Pequabuck River. On the upper tributaries of the Farmington River are located the water supply reservoirs of the Hartford Metropolitan District; and a number of built-up communities and several industrial establishments are situated in the watershed above the confluence of the river with the Connecticut.

At the request of the Connecticut pollution control agencies, a Subcommittee on Classification of the Farmington River Basin was established in 1937 and coordinated studies were conducted by the pollution control agencies of the two States during 1958 and 1959.

A public meeting was held in Farmington, Connecticut, on April 5, 1960 for the purpose of acquainting interested parties with the present condition of the waters and to obtain their views on the classifications proposed by the two States. The meeting was attended by 150 persons representing various groups concerned. On April 27, 1960 the Commission officially approved a classification for the waters of the Farmington River Basin in accordance with proposals submitted by Connecticut and Massachusetts.

The classification approved by the Commission provides for Class B or recreational waters in Massachusetts and for the main stem of the Farmington River in Connecticut. The tributary Pequabuck would be raised in water quality from a Class D to a Class C category which is suitable for fish habitat and recreational boating.

CLASSIFICATION
of
INTERSTATE WATERS

COMMISSION-APPROVED

Beaver Brook Basin (N.H.-Mass.)
Blackstone River (Mass.-R.I.)
Connecticut River (Mass.-Conn.)
Farmington River Basin (Mass.-Conn.)
Hoosic River Basin (Vt.-Mass.-N.Y.)
Housatonic River (Mass.-Conn.)
Pawtuxet River Basin (R.I.-Conn.)
Quinebaug River Basin (Mass.-Conn.-R.I.)
Saco River Basin (N.H.-Me.)
Salmon Brook Basin (Mass.-N.H.)
Spicket River Basin (N.H.-Mass.)
Taunton River-Mount Hope Bay (Mass.-R.I.)
Ten Mile River Basin (Mass.-R.I.)

STUDIES COMPLETED

Batten Kill Basin (Vt.-N.Y.)
Deerfield River Basin (Vt.-Mass.)
Lake Champlain Basin (N.Y.)
Millers River Basin (N.H.-Mass.)
Piscataqua River Basin (Me.-N.H.)
Tennille River Basin (N.Y.-Conn.)

STUDIES IN PROGRESS

Androscoggin River (N.H.-Me.)
Connecticut River (N.H.-Vt.)
Lake Champlain Basin (Vt.)
Little and Pawtow Rivers (N.H.-Mass.)
Merrimack River (Mass.)
Nashua River Basin (Mass.-N.H.)
Scantic River Basin (Mass.-Conn.)
Westfield River Basin (Conn.-Mass.)

Technical Advisory Board Chairman Albert describes to the Commission a proposed classification for the waters of the Millers River, a principal tributary of the Connecticut River.
MILLERS RIVER BASIN
(N.H.-Mass.)

The Millers River is tributary to the Connecticut River at Millers Falls in Massachusetts and is fed by a number of small streams originating in New Hampshire. The total drainage area encompasses 384 square miles of which 311 are in Massachusetts. The principal communities in the Massachusetts area are Athol, Gardner, Millers Falls, Orange and Winchendon. Located in the upper watershed in Massachusetts are the Birch Hill and Tully flood control reservoirs. The New Hampshire portion of the watershed is sparsely populated and the waters entering Massachusetts are of high quality.

A report on the pollution control needs in the Millers River Basin was conducted by the Massachusetts Department of Public Health in 1950 under a legislative directive. The Department recently completed a sanitary survey to verify the conditions reported in 1950 and has initiated a pollution abatement program to comply with the classification proposals made at that time.

In 1960 New Hampshire conducted sampling tests and surveys in the New Hampshire portion of the drainage basin and it is anticipated that Commission approval of the classifications will be requested in 1961.

BATTEN KILL BASIN
(Vt.-N.Y.)

The Batten Kill, an interstate tributary of the Hudson River in New York, has its headwaters in Vermont. Recreation and dairying are the principal industries in the watershed which encompasses 445 square miles, 243 lying in southwestern Vermont and 202 in eastern New York.

A Subcommittee on Classification of the Batten Kill Basin was established in 1956. Vermont and New York have completed the field work and started the preparation of their classification reports. Both States will hold hearings on the proposed classifications for their respective portions of the drainage area. Approval of the classifications by the Commission will be requested by the two States early in 1962.

DEERFIELD RIVER BASIN
(Vt.-Mass.)

In response to requests received from sportsmen's organizations in western Massachusetts, a Subcommittee on Classification of the Deerfield River Basin was established in 1956. The Deerfield River is an interstate tributary of the Connecticut River located in the north central section of Massachusetts and the south central section of Vermont. The total drainage area of 660 square miles is about equally divided between the two States.

The Deerfield River is a popular fishing stream and is stocked by the Vermont and Massachusetts fish and game agencies. The New England Power Company has developed the river for hydro-electric power and the atomic power plant of the Yankee Atomic Electric Company is now in operation in Rowe, Massachusetts, just below the Vermont line.

Surveys and sampling programs have been conducted by Vermont and Massachusetts in their respec-
tive watershed areas and proposed classifications have been prepared. Both States will hold public meetings to receive comments and suggestions on the proposed classifications, and Commission approval will be requested in early 1961.

**PISCATAQUA RIVER BASIN**
(Me.-N.H.)

The Piscataqua River and its principal interstate tributary, the Salmon Falls River, form the boundary between Maine and New Hampshire for a distance of about 40 miles. Of the total drainage area of 1,022 square miles, 776 are located in New Hampshire. Nine miles above its mouth, the Piscataqua River receives the flow from a New Hampshire tidal basin, known as Little and Great Bays, which covers approximately 6,200 acres. Principal communities in the drainage basin in Maine are Kittery, Berwick and South Berwick; and in New Hampshire are Portsmouth, Dover, Durham, Exeter, Rochester, Newmarket and Somersworth.

To coordinate the work of the States, a Subcommittee on Classification of the Piscataqua River Basin was established in 1956. Preliminary classification studies were initiated in 1957 and continued during the summers of 1958 and 1959. The two States have completed their studies and agreed on the present water conditions and proposed classifications. Following public hearings held by the pollution control agency of each State, the recommended classifications will be filed with the 1961 legislatures in Maine and New Hampshire for enactment into law.

**NASHUA RIVER BASIN**
(Mass.-N.H.)

The Nashua River is formed by the confluence of the North Nashua River and the South Branch at Lancaster, Massachusetts, and flows in a general northerly direction to join the Merrimack River at Nashua, New Hampshire. It has a drainage area of 515 square miles of which 310 are located in Massachusetts and 205 in New Hampshire. Wachusett Reservoir, a source of water supply for the Boston Metropolitan District, is located on the South Branch and has a watershed of 108 square miles. Nashua is the principal community in the New Hampshire portion of the drainage area and Ayer, Fitchburg, Groton and Leominster are sizeable communities in the Massachusetts watershed.

Several sections of the Nashua River in both Massachusetts and New Hampshire are in a nuisance condition during the dry period of the year, and a Subcommittee on Classification of the Nashua River Basin was directed to study the problem. The condition of the river is due principally to the discharge of paper-mill wastes in Massachusetts, and a few years ago, primary treatment units were installed at several paper mills. This type of treatment has been inadequate, and following a successful laboratory experiment on the treatment of paper-mill wastes at the Lawrence Experiment Station, the Massachusetts Department of Public Health is undertaking pilot plant studies.

**LAKE CHAMPLAIN BASIN**
(N.Y.-Vt.)

The Lake Champlain Basin is one of the largest interstate watersheds in theCompact area containing over 5,000 square miles in Vermont and New York. Lake Champlain, which has a water surface of about 430 square miles, and the Poulterney River form the boundary between the two States for a distance of approximately 120 miles.

New York has classified all its waters within the Lake Champlain Basin and pollution abatement programs are in progress. Classification studies of Lake Champlain in Vermont have been continued and a number of the lake's major tributaries have been or are being classified by Vermont.
Sources of pollution and resulting conditions in the Nashua River Basin are observed on field examination participated in by the Massachusetts and New Hampshire members of the New England Interstate Water Pollution Control Commission and water pollution control officials of the two States.
MERRIMACK RIVER BASIN
(N.H.-Mass.)

In the highly industrialized Merrimack River Basin in New Hampshire and Massachusetts, classification studies have been made on several of the principal tributaries in each State. Three interstate tributaries of the Merrimack, namely, Salmon Brook, Beaver Brook and the Spicket River, have been classified. Two other interstate tributaries, the Little and Powow Rivers, which have their sources in New Hampshire and join the Merrimack at Haverhill and Amesbury respectively, are being studied for classification purposes.

CONNECTICUT RIVER BASIN
(N.H.-Vt.-Mass.-Conn.)

In 1955, the Commission approved classifications for the 110 mile main stem of the Connecticut River in Massachusetts and Connecticut. Since that time New Hampshire and Vermont, through the Subcommittee on Classification of the Connecticut River, have continued coordinated studies on the Connecticut River and its tributaries with a view toward the preparation of recommended classifications.

One of the principal tributaries of the Connecticut River is the Westfield River which has its confluence with the Connecticut River at West Springfield, Massachusetts. The drainage basin in Connecticut and Massachusetts has an area of 517 square miles, practically all of which is in Massachusetts. For several years Massachusetts has been conducting extensive studies of pollution control problems in the Westfield River Basin. Commission approval of proposed classifications is tentatively scheduled for 1961.

The Scantic River is an interstate tributary of the Connecticut River at South Windsor, Connecticut. Its source is in Massachusetts but most of its drainage area of 113 square miles is in Connecticut. Sampling programs and surveys of sources of pollution are being conducted by the pollution control agencies of the two States. Approval of proposed classifications by the Commission will be requested in 1961.

Boarding the S.E.S. Alliance for inspection tour of lower Merrimack River, sponsored by the Merrimack River Valley Sewerage Board, are State and local officials. There has recently been renewed interest in water pollution control by Merrimack River communities in Massachusetts.
POLLUTION ABATEMENT POLICY FOR UNCLASSIFIED WATERS OF THE CONNECTICUT RIVER IN NEW HAMPSHIRE AND VERMONT

WHEREAS, The Connecticut River is an interstate stream as defined in the New England Interstate Water Pollution Control Compact, and

WHEREAS, There is an unclassified portion of the Connecticut River lying within the confines of the Compact-member States of New Hampshire and Vermont, and

WHEREAS, Said States not only have a mutual interest in improving the sanitary condition of this unclassified portion of the Connecticut River, but also certain responsibilities relative thereto under their respective State water pollution control laws and the provisions of the New England Interstate Water Pollution Control Compact, and

WHEREAS, There are no definite plans for classifying this portion of the Connecticut River in the immediate future, and

WHEREAS, The incentives provided by Federal grants and by State-aid in New Hampshire and Vermont to assist municipalities in the construction of sewage treatment works are prompting many Connecticut River communities to proceed voluntarily with pollution abatement projects for the construction of such works and in connection therewith to retain consulting engineers for the preparation of the necessary plans and specifications for such facilities,

NOW THEREFORE, It is determined by the States of New Hampshire and Vermont that the recommended minimum standard for approval of all pollution control projects on the unclassified section of the Connecticut River shall provide for the installation of primary settling or its equivalent until such time as research or unforeseen developments in treatment techniques shall have demonstrated to the mutual satisfaction of said States, that other methods are equally acceptable, and it is

FURTHER DETERMINED, That the sewage treatment works in the so-called Wilder Lake section of the Connecticut River shall consist of primary treatment and chlorination, and for the section of the Connecticut River from Wilder Dam downstream to the Massachusetts State line, the treatment plants shall contain primary treatment facilities with provisions for chlorination at a later date, if required under the classifications adopted, and it is

FURTHER DETERMINED, That the States of New Hampshire and Vermont will conform to the following policy relative to requests for permission to make additional discharges into the unclassified waters of the Connecticut River.

1. Where application is made to the regulatory agency by individuals, municipalities or industries for permission to discharge additional amounts of sewage and/or industrial wastes, the regulatory agency will investigate and either allow or deny such application upon the basis of the facts involved in accordance with the statutes governing.

2. Recognizing the limitations of personnel and funds as well as the inconvenience and delay which can result for individuals and municipalities, a limited number of dwellings may be connected to existing systems of sewerage without previous approval by the regulatory agency.

3. Significant increases in sewage discharges such as occur as a result of housing developments shall be reported to the regulatory agency by the proper local authorities and an investigation shall be made by the regulatory agency.

4. Where additional discharge of sewage will involve the installation of a new sewer outfall or an increase in the capacity of existing sewerage, the matter shall be reported to the regulatory agency and approval may be granted only after due investigation and consideration by the regulatory agency.

5. Where the regulatory agency grants permission in conformity with the laws of its State to make additional discharges of raw sewage, it shall be with the express understanding that the municipality shall undertake engineering studies of the over-all pollution control needs of the community with a view to the construction of sewage treatment facilities.

Adopted by the New England Interstate Water Pollution Control Commission at its Meeting at Whitefield, N. H., on September 29, 1960.
ANDROSCOGGIN RIVER BASIN
(N.H.-Me.)

The Androscoggin River rises in Maine and flows into New Hampshire and thence into Maine to its outlet below Brunswick. Paper mills and sizeable communities discharge their untreated wastes to the river. Maine has classified its tributaries of the Androscoggin, and both States, acting through the Androscoggin Classification Subcommittee organized in 1937, are continuing their classification studies.

During the past decade comprehensive water pollution control statutes, providing for the classification of all State waters, were enacted in New Hampshire, New York, Vermont and Maine. Under these laws the State pollution control agencies conduct classification studies, prepare recommended classifications and hold public hearings. The official classification of water is vested in the legislatures in New Hampshire and Maine, whereas in New York and Vermont this authority is delegated to their pollution control boards. The pollution control laws of Massachusetts, Rhode Island and Connecticut do not provide for the classification of their tidal and inland waters. However, practically all their waters can be termed interstate and are considered officially classified upon approval by the New England Interstate Water Pollution Control Commission. The classification plan of the Commission is used by these three States in their pollution control studies of intrastate streams.
TENTATIVE PLAN
for
CLASSIFICATION WORK ON INTERSTATE WATERS
1960-61

Connecticut
(1) Classification study of Westfield River Basin with Massachusetts
(2) Classification study of Scantic River Basin with Massachusetts

Maine
(1) Completion of classification of Piscataqua River Basin with New Hampshire
(2) Continuation of studies of Androscoggin River with New Hampshire

Massachusetts
(1) Completion of classification of Deerfield River Basin with Vermont
(2) Classification study of Merrimack River
(3) Continuation of studies of Merrimack tributaries with New Hampshire (Little and Powow Rivers)
(4) Classification studies of minor interstate streams with Rhode Island
(5) Classification study of Nashua River Basin with New Hampshire
(6) Completion of classification of Millers River Basin with New Hampshire
(7) Classification study of Scantic River Basin with Connecticut

New Hampshire
(1) Completion of classification of Piscataqua River Basin with Maine
(2) Continuation of studies of Androscoggin River with Maine
(3) Classification studies of Connecticut River with Vermont
(4) Continuation of studies of Merrimack tributaries with Massachusetts (Little and Powow Rivers)
(5) Classification studies of Connecticut River tributaries
(6) Classification study of Nashua River Basin with Massachusetts
(7) Completion of classification of Millers River Basin with Massachusetts

New York
(1) Completion of classification of Batten Kill with Vermont
(2) Completion of classification of Tenmile River Basin (Tributary to Housatonic River)

Rhode Island
(1) Classification studies of minor interstate streams with Massachusetts

Vermont
(1) Completion of classification of Deerfield River with Massachusetts
(2) Classification studies of Connecticut River with New Hampshire
(3) Completion of classification of Batten Kill with New York
(4) Classification study of Lake Champlain
(5) Classification studies of Lake Champlain tributaries
(6) Classification studies of Connecticut River tributaries
PLANNING AND CONSTRUCTION OF TREATMENT FACILITIES

STATUS OF POLLUTION ABATEMENT INSTALLATIONS

Progress in the water pollution control program is most effectively shown by the increase in the sewer population served by treatment facilities. In 1950 it was estimated that sewage treatment works had been provided for only 39 per cent of the sewer population in the New England Compact area. Similar data prepared by the signatory States for 1960 indicate that treatment works are now in operation for 64 per cent of the population. In addition, treatment plants now under construction or about to be constructed will serve 20 per cent more or 84 per cent of the sewer population. This represents an increase of about 115 per cent in the past decade.

During the year 19 sewage works projects costing $11 million were completed in the Compact area and included 14 new sewage treatment plants, and alterations and additions to 3 others. Construction continued on sewage works projects estimated to cost $22 million and was started on 14 new projects totaling over $14 million in cost.

Since the organization of the New England Interstate Water Pollution Control Commission in 1947, sewage works costing over $235 million have been placed in operation or construction started and include 109 new municipal sewage treatment plants. In addition to the new treatment facilities, 59 projects in the construction program have involved the enlargement and modernization of treatment works. Continued progress in the construction program is indicated from the State inventories which show that preliminary engineering reports for sewage treatment plants estimated to serve a total population of 330,000 have been approved for 64 communities.

The records of installation of industrial waste treatment facilities are not as impressive as in the case of sewage treatment works construction. In general, the State water pollution control agencies have concentrated their efforts in pressing for industrial waste treatment only in those instances where pollution abatement programs are under way on classified waters or where nuisance conditions attributable to industrial waste discharges have occurred. From available statistics, there are approximately 1,500 industrial plants in the Compact area producing toxic and organic wastes. Of these, about 1,000 discharge their wastes to municipal sewerage systems and 380 have private waste treatment facilities in operation or under construction. Since 1947 there have been over 300 waste-producing industries connected with municipal sewerage systems which now have or will eventually have treatment plants. During the same period, 315 private waste treatment facilities have been installed or are under construction.

The sewage treatment works construction program has been advanced by the cooperative effort of Federal, State and local governments. On the Federal level, advance planning loans and construction grants-in-aid have accelerated the program. The community facilities planning loan program of the Federal Housing and Home Finance Agency was authorized under Public Law 560 of the 83rd Congress. These loans are interest-free and must be repaid when construction is started. In 1956 under the Federal Water Pollution Control Act (Public Law 660 of the 84th Congress) grants to municipalities for the construction of sewage treatment works were made available. This legislation authorized a $50 million annual appropriation for a ten-year period for such grants which are limited to 30 per cent of the estimated cost of a project or $250,000, whichever is the smaller.

Federal construction grants to communities in the Compact area have been approved for 110 projects estimated to cost $55.9 million. The Federal grants for these projects total $13.6 million which means that for every dollar made available in grants there will be spent over $3 in local funds. Of the 110 approved projects, which are described in an accompanying table, 36 have been completed and 52 are under construction.

To further encourage communities to construct sewage treatment works, the 1957 legislative sessions in Maine and Vermont provided for State grants-in-aid of 20 per cent of the cost of a project. New Hampshire enacted legislation in 1959 under which the State pays yearly 20 per cent of the annual charges of financing
### Ion and Trickling Filter

#### Estimated Cost of Project

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Cost of Project</th>
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<td>Keene</td>
<td>I</td>
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<td>Nashua</td>
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<tr>
<td>New York (in Compact area)</td>
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<tr>
<td>Rhode Island</td>
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#### Federal Grant

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<tr>
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<tr>
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#### Summary

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<td>2</td>
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<td>45</td>
<td>13</td>
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<td>7</td>
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<td>5</td>
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<td>1,234,994</td>
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<td>3</td>
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<td>36</td>
<td>$55,882,334</td>
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#### Type Code
- **T**: Treatment Plant
- **I**: Interceptor
- **O**: Outfall
- **S**: Stabilization Ponds

#### Ion Tank

- **Air Pipe**
- **Sludge Digestion Tanks**
the construction of a municipal pollution abatement project. The subject of State grants for sewage works construction is being studied in New York and Massachusetts with a view toward preparing recommendations for legislative action.

SUMMARY OF ACTIVITIES IN TREATMENT WORKS CONSTRUCTION

The following is a description of the activities in each State during the year in the advancement of projects to abate water pollution.

Connecticut

Construction was completed on sewage treatment plants providing secondary treatment at Milford, Rockyville and Westport. Also completed were the adjoining sewage and industrial waste treatment plants for Wallingford.

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<tr>
<th>STATE</th>
<th>ALLOTMENT</th>
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<td>Connecticut</td>
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<td>Vermont</td>
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<td><strong>Total</strong></td>
<td><strong>$6,705,100</strong></td>
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</table>

Among many new sewage treatment facilities being placed in operation in Connecticut is this primary type plant for Willimantic. The engineers for this Shetucket River facility were Gibbs & Hill, Incorporated.
The Wallingford municipal sewage and industrial waste treatment plants shown in this aerial view were completed in 1960. The sewage treatment plant is of the high-rate trickling filter type and the industrial waste treatment plant, which initially will handle wastes from four factories, consists of pH adjustment, cyanide oxidation and settling facilities. These Quinnipiac River plants were designed by Bowe, Albertson & Associates.

Sewage works construction started during the year included new treatment plants at Farmington, Glastonbury and Plymouth. The Farmington plant will serve the villages of Farmington and Unionville, and the Plymouth installation will provide treatment for the sewage from Terryville and Pequabuck, the populated sections of the town. Construction also started on a sewerage system for East Haven; the sewage will be discharged into the adjacent New Haven system for treatment.

Plans were approved for twenty sewage treatment plants including those for Branford, Greenwich, Meriden, Middletown, New Canaan, Plainville, Sharon, Tariffville, Thomaston and Winsted.

In the industrial waste treatment field, seven treatment plants were under construction and plans were reviewed for eight proposed new treatment facilities.
Maine

With the appropriate ceremonies attended by Federal, State and local officials, the two Kennebunk sewage treatment plants were officially dedicated in May 1960. Both plants are of the primary type; one serves the village and the other the beach section of the town. Completion of Old Orchard Beach’s sewage treatment plant to meet classification requirements was accomplished in time for the 1960 season. This primary type plant was placed in operation Memorial Day weekend and eliminates all discharges of raw sewage into the ocean. At Presque Isle a primary treatment plant was constructed to conform with the Aroostook River Basin classification.

The Sanford Sewerage District engaged consulting engineers to prepare final plans for treatment works consisting of stabilization ponds, and construction plans for a treatment plant to serve the Goosefare Brook section of Saco were being prepared.

Preliminary reports on sewage treatment needs including cost estimates were completed for Norway, South Paris and Rockland. Caribou, Rockland and Skowhegan were added to the list of communities engaging engineers to prepare preliminary reports on treatment requirements.

Consulting engineers engaged by the State to investigate the noxious odors emanating from the Presumpscot River submitted their report. Remedial measures recommended provide for either treatment plants for the wastes from the paper mill in Westbrook and the sewage from Westbrook, Falmouth, and the section of Portland in the drainage area, or, a large intercepting sewer from Westbrook down the Presumpscot River to discharge into the ocean.

The main street of Old Orchard Beach, Maine, was clogged with cranes, trucks and bulldozers as the work was rushed to successfully complete the sewage works project prior to the opening of the 1960 vacation season at this renowned resort. The project included the installation of an interceptor as shown in the photograph and the construction of a primary treatment plant.
The town of Kennebunk on Maine's southern coast has completed the construction of two primary treatment plants to meet the adopted classifications for bathing waters. One plant is located in the village and the other is in the beach section. The clarifier and digester are shown in this photograph taken at the Kennebunk Beach plant.
Massachusetts

In connection with the pollution abatement program of the Metropolitan District Commission for Boston Harbor and its tributaries, work continued on the Deer Island sewage treatment plant which will serve the North Metropolitan Sewerage District and Boston proper. Construction also continued under the Metropolitan District Commission's program on the Charles River Relief Sewer and on the Wilmington Interceptor which will connect with the North Metropolitan Sewerage System. The Randolph Interceptor which will convey sewage into the South Metropolitan Sewerage System for treatment at the Nut Island treatment plant was completed and construction started on the Westwood Interceptor which will also discharge into the South Metropolitan Sewerage System.

Under the pollution abatement program for compliance with the classification approved for the Connecticut River, considerable progress was recorded during the year. Sewage treatment plants were completed and placed in operation at Easthampton, Russell, South Hadley and Sunderland. Amherst started construction of an interceptor and final plans were approved for enlarging and improving the existing sewage treatment facilities of the town. Work began on the Longmeadow interceptor and has continued during the year on two interceptors in Agawam for conveying sewage to the

A town meeting at Williams- town, Massachusetts, voted overwhelmingly to construct a sewage treatment plant. This action was in accordance with the pollution abatement program for compliance with the approved classification for the interstate Hoosic River Basin.
Springfield municipal sewage treatment plant. Final construction plans for an interceptor and treatment plant for Ware received approval and an engineering report on sewerage and sewage treatment for East Longmeadow was also approved. The preparation of final plans and specifications for sewage treatment plants was authorized by Chicopee and Holyoke.

In the Housatonic River Valley, construction of the interceptors in Pittsfield and Dalton was started and final construction plans for the new sewage treatment plant to serve the two communities were approved. Consulting engineers were engaged by Lee to prepare final plans for municipal sewage treatment works.

Construction projects completed during the year in other river basins in the Commonwealth included the Marshfield sewage treatment plant, additions to the North Attleboro treatment facilities and the modernization and enlargement of the Mansfield treatment plant. Improvements to the Worcester sewage treatment works were started and final plans for the Quequechan River interceptor in Fall River were approved. Williamstown voted to proceed with the construction of a treatment plant to abate pollution of the Hoosic River.

Engineering reports on required sewage treatment facilities for North Dighton and Westboro were approved and similar reports were being prepared on studies for Brookfield, Dighton, Holden, Plymouth, Rockland, Tewksbury and Whitman.

The Pittsfield-D Dalton multi-million dollar pollution abatement project for the Housatonic River in Massachusetts includes interceptors in Dalton and Pittsfield and joint sewage treatment facilities in the latter community. Installation of the interceptors is under way and the contract for the treatment plants calls for completion by early 1963. The consulting engineers are Camp, Dresser & McKee.
First stage construction of Nashua's pollution abatement project involving a primary treatment plant and Salmon Brook interceptor was started in 1960. Photographs depict the installation of a section of the interceptor near the treatment plant. A classification for the waters of Salmon Brook in Massachusetts and New Hampshire has been approved.

New Hampshire

The lagoons or stabilization ponds for the treatment of sewage at Jaffrey were placed in operation early in 1960. The first phase of Dover's pollution abatement program was completed with the placing in operation of the primary treatment plant on the Cocheco River. Also completed during the year were the treatment facilities for Newbury on Lake Sunapee. In the final stages of construction are the plant improvements and outfall at the Laconia State School and the West Side Interceptor in Keene which will convey sewage to the recently enlarged and renovated municipal sewage treatment plant.

Bids were received and construction started on the primary treatment plant and Salmon Brook Interceptor
in Nashua. Final plans were approved for the installation of interceptors in areas not now served, and for enlarging and improving the secondary treatment plant at Hampton.

Portsmouth appropriated funds for the construction of sewage treatment facilities and interceptors and similar action was taken by Goffstown for an interceptor. Final plans for the Goffstown project were approved and bids received.

Studies by consulting engineers to determine sewage treatment requirements were made for Ashland, Claremont, Lancaster, Newport and Salem. The Claremont study involves improvements to the sewage plant to permit the treatment of greater quantities of industrial wastes.

**New York**

In the New York portion of the New England Compact area, Bolton Landing on Lake George recently completed the construction of a secondary type sewage treatment plant. Other communities in the Lake Champlain Basin which are proceeding with sewage treatment plans to conform with adopted classifications are Champlain, Dannemora, Port Henry and Willsboro.

The village of Pawling in the Housatonic River Basin has had plans prepared for the construction of secondary treatment works and plans have been approved for an interceptor and sewage treatment plant for Hoosick Falls in the Hoosic River Basin.
Rhode Island

Westerly’s new sewage treatment plant was officially dedicated at open house ceremonies with a large public attendance. The new primary treatment plant is part of the pollution abatement program to meet the classification approved for the Pawcatuck River and replaces the town’s obsolete treatment facilities.

Also completed were the additional improvements to increase the efficiency of operation of the recently renovated Providence sewage treatment works at Fields Point and the Newport project for pumping stations and interceptors to divert raw sewage discharges into Newport Harbor to the municipal treatment plant.

In the Johnston Sanitary District work continued on the sewerage system project. The sewage from the District will discharge into the Providence municipal system.

The Fields Point sewage treatment plant at Providence, Rhode Island, following extensive renovation and reconstruction is shown in this aerial photograph. Metcalf & Eddy were the consulting engineers for the project.
The voters of Woonsocket approved a bond issue of $1.75 million for the construction of a primary sewage treatment plant and appurtenant works to reduce pollution of the Blackstone River caused by the inadequacy of the existing treatment plant. Approval was given also in West Warwick to the issuance of bonds for sewer extensions and additional equipment at the activated-sludge sewage treatment plant. The presently overloaded sludge beds will be replaced by vacuum filters for dewatering digested sludge.

The growth of Middletown has necessitated the town starting an extensive sewerage project which will entail sewer extensions and connections to the Newport treatment plant and will ultimately require construction of a treatment plant and interceptors on the east side of town.

**Vermont**

Vermont has been particularly active in promoting its treatment plant construction program. Construction of the Barre (City) treatment works was completed during the year, and it is anticipated that the treatment

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Winooski is one of the many Vermont communities which have engaged engineers to study its sewage treatment requirements. This perspective shows the primary treatment plant proposed for the city as part of the pollution abatement program in the Winooski River Valley.
Vermont sewage treatment plants under construction in 1960 for Springfield on the Black River (above) and for Bennington on the Wahoo River (below). The Springfield plant was designed by Barker and Wheeler, Engineers, and Charles A. Maguire & Associates are the engineers for Bennington.

plants at Bennington, Springfield and Shelburne will be completed early in 1961. These plants provide for primary treatment.

The renovation of St. Albans sewage treatment plant to provide for enlargement and secondary treatment was initiated, and contracts were awarded for primary treatment plants at Brandon, Manchester and Randolph.

Funds were appropriated by Bellows Falls, Proctor and Rutland for the construction of sewage treatment facilities and final plans are in process. Engineers were engaged by Barre (Town), Berlin, Essex Junction, Middlebury, St. Johns and Winooski to prepare final plans for proposed sewage treatment works.

Preliminary engineering studies with cost estimates were prepared for Cabot Village, Colchester, Groton, Hartford, Marshfield Village, Middlebury, Milton, Montpelier, Newport, Plainfield, Richmond, Ryegate, Stowe, Vergennes, Waterbury, Wells River and Winooski. Similar studies are being conducted by consulting engineers for Bradford, Island Pond, Northfield, South Burlington, Williamstown and Woodstock.
RESEARCH PROJECTS

A very rewarding activity of the Commission since 1949 has been a program of research directed primarily toward the solution of waste treatment and disposal problems confronting many of the diversified industries in the area. The various projects under the program have been financed, for the most part, by grants to the Commission under the Federal Water Pollution Control Act and have been conducted through contractual arrangements with technical institutions in the Compact area including the University of Rhode Island, Tufts University in Massachusetts, Wesleyan University in Connecticut and the University of New Hampshire. The Commission has approved only those projects suggested by its Committee on Research which are of concern to all the State pollution control agencies in the region.

The first project undertaken was a survey to obtain an over-all picture of the industrial waste problems in the area and the relative importance of each industry in the pollution control program. The survey showed that textile mills headed the list with the paper and pulp mills a close second insofar as their total pollution loads were concerned, then followed tanneries, breweries, canneries and dairies.

The textile industry being the largest contributor of wastes, special emphasis has been placed throughout the Commission’s program on studies of textile-mill wastes. A critical review of the literature on textile wastes was made first and comprehensive waste studies were conducted at cotton, woolen and synthetic fiber mills. The reports on these studies created considerable interest because they embodied a new principle—the substitution of low oxygen-demanding process chemicals for high oxygen-demanding chemicals as a means of abating pollution.

Infrared recorder has been added to equipment at Wesleyan University for routine and research analytical work.

Automatic mechanical sampler has been developed at the Industrial Waste Laboratory of Wesleyan University for accurate sampling of waste discharges and streams. This unit will collect twelve samples over an eight or twenty-four hour period.

Continuing at Wesleyan University are Commission projects involving the treatment of wastes from textile mills, dairies, paper mills, printed circuit plants and tanneries, as well as extensive sludge digestion experiments.

The Massachusetts Health Research Institute is conducting a project relating to modified activated sludge waste treatment units of the “package” type. Many of these units have recently been installed in the New England Compact area for the treatment of sewage and/or industrial wastes. The project includes a study of the design, operation and efficiency of the units and is being conducted at the Massachusetts Institute of Technology and the Lawrence Experiment Station of the Massachusetts Department of Public Health.

Nearing completion at the University of New Hampshire is a report on the results of the first year’s operation of the stabilization ponds or lagoons installed for the treatment of sewage at Derry, New Hampshire. Consideration is being given to the continuation of this project to determine the efficiency of this type of treatment under New England climatic conditions, and to expanding the project to include the lagoon system recently completed at Jaffrey, N.H.
Conducting bacteriological work in connection with the Commission's study of the lagoon treatment of sewage at the Engineering Experiment Station of the University of New Hampshire.

REPORTS

on

COMMISSION-SPONSORED RESEARCH PROJECTS

Survey of Textile Wastes—N.E.I.W.P.C. Compact Area
(University of Rhode Island—1950)

*Textile Wastes—A Review 1936-1950
(Wesleyan University—1950)

Survey of Industrial Wastes—N.E.I.W.P.C. Compact Area
(University of Rhode Island—1951)

Survey of Wastes from a Small Textile Mill Processing Wool and Cotton
(Tufts College—1951)

A Study of Cotton Finishing Wastes
(University of Rhode Island—1951)

A Survey of Three Textile Mills in Connecticut
(Wesleyan University—1951)

*Industrial Wastes in the New England Interstate Water Pollution Control Compact Area
(University of Rhode Island—1952)

*Industrial Waste Surveys of Two New England Cotton Finishing Mills
(Wesleyan University and University of Rhode Island—1953)

Treatment Plants for Cotton Finishing Wastes
(University of Rhode Island—1953)

*Pollution Sources in Wool scouring and Finishing Mills and Their Reduction Through Process and Process Chemical Changes
(Wesleyan University—1954)

*Pollution Sources From Finishing of Synthetic Fibers
(Wesleyan University—1956)

*Tannery Wastes—Pollution Sources and Methods of Treatment
(Wesleyan University—1958)

*A Simplification of Textile Waste Survey and Treatment
(Wesleyan University—1959)

Use of Electronics and Automatic Equipment in Water Conservation, Sampling, Treatment and Pollution Studies
(Wesleyan University—1960)

Dairy Wastes—Pollution Sources and Treatment
(Wesleyan University—1960)

Pollution Reduction in Cotton Mills Through Process Chemical Substitutions
(Wesleyan University—1960)

Pollution Reduction in Woolen Mills Through Process Chemical Substitutions
(Wesleyan University—1960)

Report of Performance of Derry Sewage Lagoons
(University of New Hampshire—1960)

Report on Study of Chlorination of Raw Sewage
(Massachusetts Health Research Institute, Inc.—1960)

*Published by the Commission for distribution