

THE MASSACHUSETTS WATER POLLUTION CONTROL PROGRAM

By
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The Massachusetts Division of Water Pollution Control has been in operation for a little over one year and therefore, it seems an appropriate time to describe the structure of this organization and also summarize its principal activities to date.

The Division was established on September 6, 1966 by an act of the legislature called the Massachusetts Clean Waters Act (Chapter 685, Acts of 1966). This law states that "there shall be in the Department of Natural Resources subject to the control of the Water Resources Commission a division of water pollution control". The Commission now has two divisions under its jurisdiction as shown in Figure 1.

In effect, the Act created a new "regulatory agency" for water pollution control and has transferred this function from the Department of Public Health to the Department of Natural Resources.

LEGISLATION

There were actually four legislative acts enacted in 1966 which established the Water Pollution Control Program and these are summarized below:

- Chapter 685* Created the Division of Water Pollution Control, established a program for pollution abatement, including enforcement procedures, and gave the Division authority to establish pollution abatement districts.
- Chapter 687* Provided for \$150 million bond issue for construction grants, research and demonstration projects and construction of low flow augmentation reservoirs.
- Chapter 700* Provided for local property tax exemption for new and existing industrial waste treatment facilities.
- Chapter 701* Provided for deduction and exemption, under the business and corporation excise tax, of the expenditures for construction of industrial waste treatment facilities.

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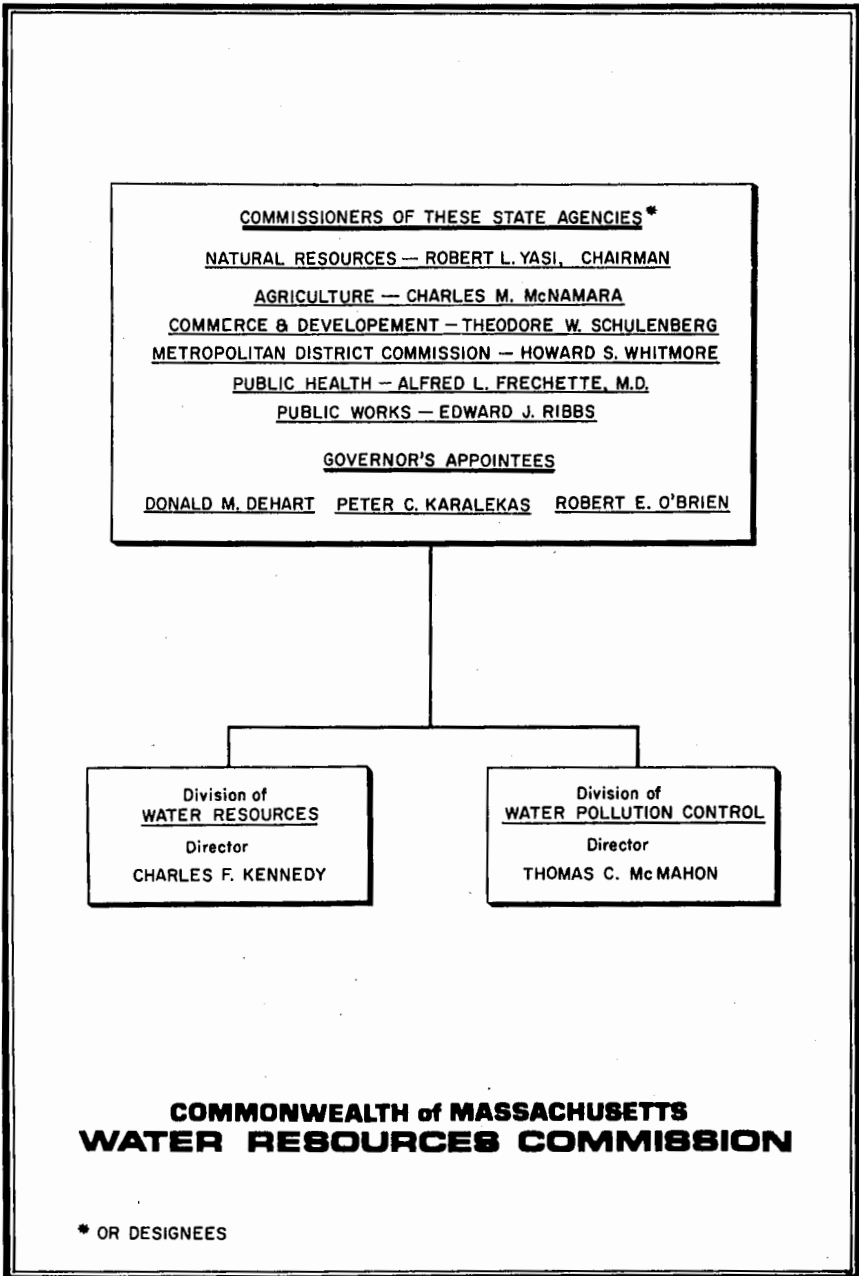


Figure 1.

There were certain inconsistencies in Chapters 685 and 687 which prevented the awarding of construction grants from the funds authorized under Chapter 687. The principal problem was that Chapter 685 called for the establishment of pollution abatement "districts" while Chapter 687 provided for aid to "cities and towns." For this and other reasons it was necessary to amend these acts before a workable construction grants program could be placed in operation.

In addition to the corrections, the amendment act also included further refinements such as:

1. Providing for pre-financing of federal grants with state funds.
2. Providing for a planning advance of up to seven percent of the project cost.

The amendment act (Chapter 873, Acts of 1967) was enacted on January 5, 1968.

WATER QUALITY STANDARDS

The principal activity of the Division during its early stages was the development of a set of water quality standards. This project required the immediate attention of the Division in order to satisfy the requirements of the Federal Water Quality Act of 1965. Further, the development of acceptable water quality standards is required in Section 26 of Chapter 685 and, under the Federal Clean Water Restoration Act of 1966, qualifies Massachusetts communities for the maximum federal construction grants.

The water quality standards are a group of criteria which have been selected to establish levels of water quality. The criteria used were: dissolved oxygen, solids, color, turbidity, coliform bacteria, ammonia, phosphate and phenol concentrations. Parameters for these criteria were then established based on the intended use of the water (Figure 2).

In addition to the water quality criteria, the Water Quality Standards contain several notes pertaining to minimum waste treatment requirements. The principal items covered are summarized below:

Inland Waters

1. All wastes shall receive secondary treatment or its industrial waste treatment equivalent, and including disinfection, except where a higher degree of treatment is required.
2. The amount of disinfection required shall be equivalent to a free and combined residual of at least 1.0 mg/l after 15 minutes contact time.

FIGURE 2
SUMMARY OF WATER QUALITY STANDARDS FOR WHICH PARAMETERS HAVE BEEN ESTABLISHED

ITEM	INLAND WATERS				COASTAL WATERS		
	CLASS A	CLASS B	CLASS C	CLASS D	CLASS SA	CLASS SB	CLASS SC
	DISSOLVED OXYGEN Minimum, mg/l Percent Saturation (1)	5.0 75	5.0 75	3.0 (2) —	2.0 —	6.5 —	5.0 —
COLIFORM BACTERIA Average value per 100 ml	50	1000	NONE (3) (3)	NONE (3)	70 *	700	NONE
pH (Min — Max)	(4)	6.5-8.0	6.0-8.5	6.0-9.0	6.8-8.5	6.8-8.5	6.5-8.5
TEMPERATURE, Deg. F							
Cold water fishery	(4)	68	68	—	—	—	—
Warm water fishery	(4)	83	83	90	—	—	—
Maximum increase	(4)	4	4	—	—	—	—
TOTAL PHOSPHATE, mg/l as P	—	0.05	0.5	—	0.07	0.07	0.07
AMMONIA, mg/l as N	—	0.5	1.0	—	0.2	0.2	1.0
PHENOLS, mg/l	—	0.001	0.002	—	—	—	—

(1) During 16 hrs of a 24 hr period.
(2) Minimum of 5.0 mg/l during 16 hrs of a 24 hr period.
(3) None in such concentrations that would impair uses assigned this class.
(4) As naturally occurs.

NOTE: The remaining criteria (solids, color and odor, chemical constituents and radioactivity) have not been assigned limiting values. Allowable concentrations depend on most sensitive water use. The complete Water Quality Standards have been published and are available from the Division of Water Pollution Control, 100 Cambridge Street, Boston, Massachusetts.

Coastal Waters

1. Appropriate treatment is defined as the degree of treatment with disinfection required for the receiving waters to meet their assigned classification.
2. Disinfection requirements are the same as for inland waters.

The Water Quality Standards were adopted by the Water Resources Commission on March 3, 1967, after a public hearing and were approved on August 8, 1967 by the U. S. Department of Interior. Massachusetts was the first New England state and fourth state in the nation to receive federal approval of its standards.

CLASSIFICATION

The various water uses have been grouped into a set of classifications which are Classes A, B, C and D for inland waters and Classes SA, SB and SC for coastal and marine waters. The following is a brief summary of how the various classes relate to water use:

Inland Waters

CLASS A: Waters designated for use as public water supplies.

CLASS B: Suitable for bathing and recreational purposes including water contact sports. Acceptable for public water supply with appropriate treatment.

CLASS C: Suitable for recreational boating and good habitat for fish and wildlife.

CLASS D: Suitable for industrial use.

Note: Class D will be assigned only where a higher water use class cannot be attained after all appropriate waste treatment methods are utilized.

Marine Waters

CLASS SA: Suitable for bathing, water contact sports and shellfish.

CLASS SB: Suitable for bathing, water contact sports, and industrial use. Suitable for shellfish with depuration.

CLASS SC: Suitable for fish and wildlife habitat and industrial use.

Following a series of public hearings held in the various river basins, all waters of the Commonwealth were classified and a series of maps were prepared which show the classification of all major streams, lakes, estuaries and coastal waters (Figure 3).^{*} Minor streams and ponds not shown on

^{*} Both the maps and written descriptions of the classifications are available from the Division of Water Pollution Control.

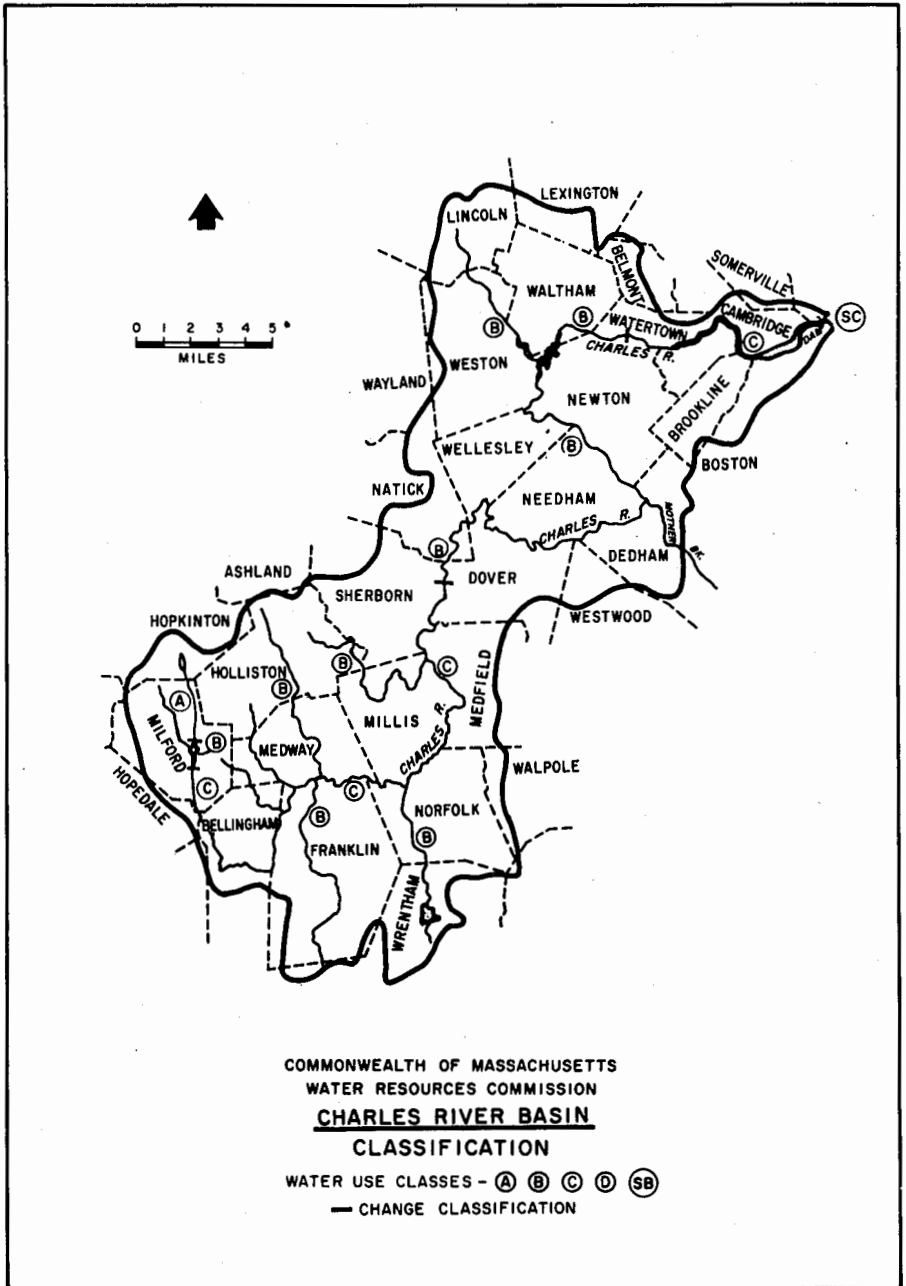


Figure 3.

these maps are considered to have a B classification. The classifications shown are proposed classifications and in most instances do not indicate the present quality of a body of water.

IMPLEMENTATION PLAN

The third principal activity of the Division was the development of a Plan of Implementation. This plan is essentially a schedule for water pollution abatement. Under the plan all known sources of pollution, both municipal and industrial, were listed. Dates were then determined for the accomplishment of each of the several steps required to construct the necessary pollution abatement facilities. Dates have normally been determined for the following six steps:

- A. Submission of a preliminary engineering report.
- B. Appropriation of funds.
- C. Acquisition of site.
- D. Submission of final construction plans.
- E. Start of construction.
- F. Completion of construction.

As of this date implementation schedules have been developed for 108 municipalities and 227 industries. As additional sources of pollution are investigated and evaluated, their names are added to the list, schedules are determined, and the polluters notified.

CONSTRUCTION GRANTS

As mentioned previously, the Division did not award any state construction grants during 1967. Federal grants were available, however, and a total of \$2,632,367 in federal grants was allocated. Procedures and requirements for a state grant program were developed and many applications for both state and federal grants were processed. Preliminary engineering reports and final construction plans for a number of projects were reviewed and approved, and many meetings were held with consulting engineers and municipal officials regarding proposed pollution abatement projects.

For the remainder of the Fiscal Year 1968 (ending June 30, 1968), there will be \$14.7 million in state funds and \$5.0 million in federal funds available for construction grants in Massachusetts.

The Massachusetts Clean Waters Act provided for the reimbursement of a portion of the cost (usually 30%) of all pollution abatement projects constructed since 1956. These projects were reviewed and the amount of payment was determined for each project. A total of \$591,134 will be paid to Massachusetts communities during Fiscal Year 1968 under the reimbursement program.

STREAM SURVEYS AND SPECIAL INVESTIGATIONS

Stream surveys were made on the Charles, Mystic and Aberjona Rivers in 1967 and a special study was made of Lake Cochituate in Natick. Other field activities consisted of complaint investigations and the investigation of industrial waste sources.

Conservation officers of the Department of Natural Resources filled a gap in the Division's field forces by performing the bulk of the sampling on the stream surveys and by making the initial investigations of complaints. These officers showed a strong interest and good capability for these activities and were a tremendous asset to the Division during its early stages of development. The Division of Law Enforcement plans to assign at least six officers to full time activity on water pollution control.

ORGANIZATION

The Division has been authorized a staff of 55 people which includes approximately 30 engineers and other technical personnel. The main office will be organized into six principal operating sections and there will be six field offices as shown in Figure 4. The staff will be multi-disciplinary in that it will consist of sanitary engineers as well as biologists, chemists and civil engineers. A diversity in backgrounds already evident in the group will add to its broad-based capability for program development. A majority of the engineers engaged to date have had experience with consulting engineer firms and/or public health departments.

CONCLUSION

The Division has the legal strength through its enforcement powers and the financial means through construction grants to develop an effective pollution control program. In the final analysis, though, its success will depend on the caliber of its personnel and on the degree of cooperation they receive from consultants, municipal officials, industrial leaders, sewage treatment plant operators and other agencies. We can all have a part in making the Division of Water Pollution Control an effective instrument for the enhancement and preservation of water quality.

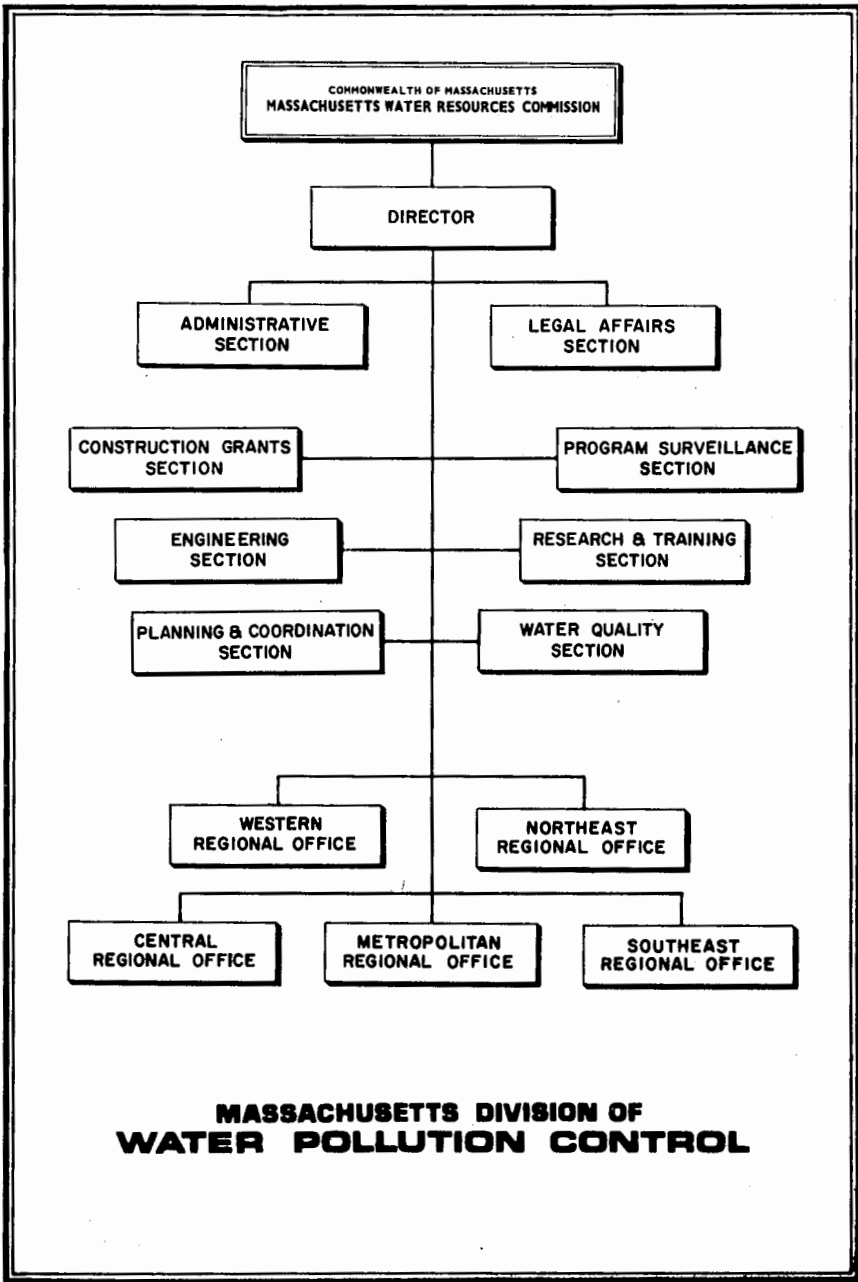


Figure 4.