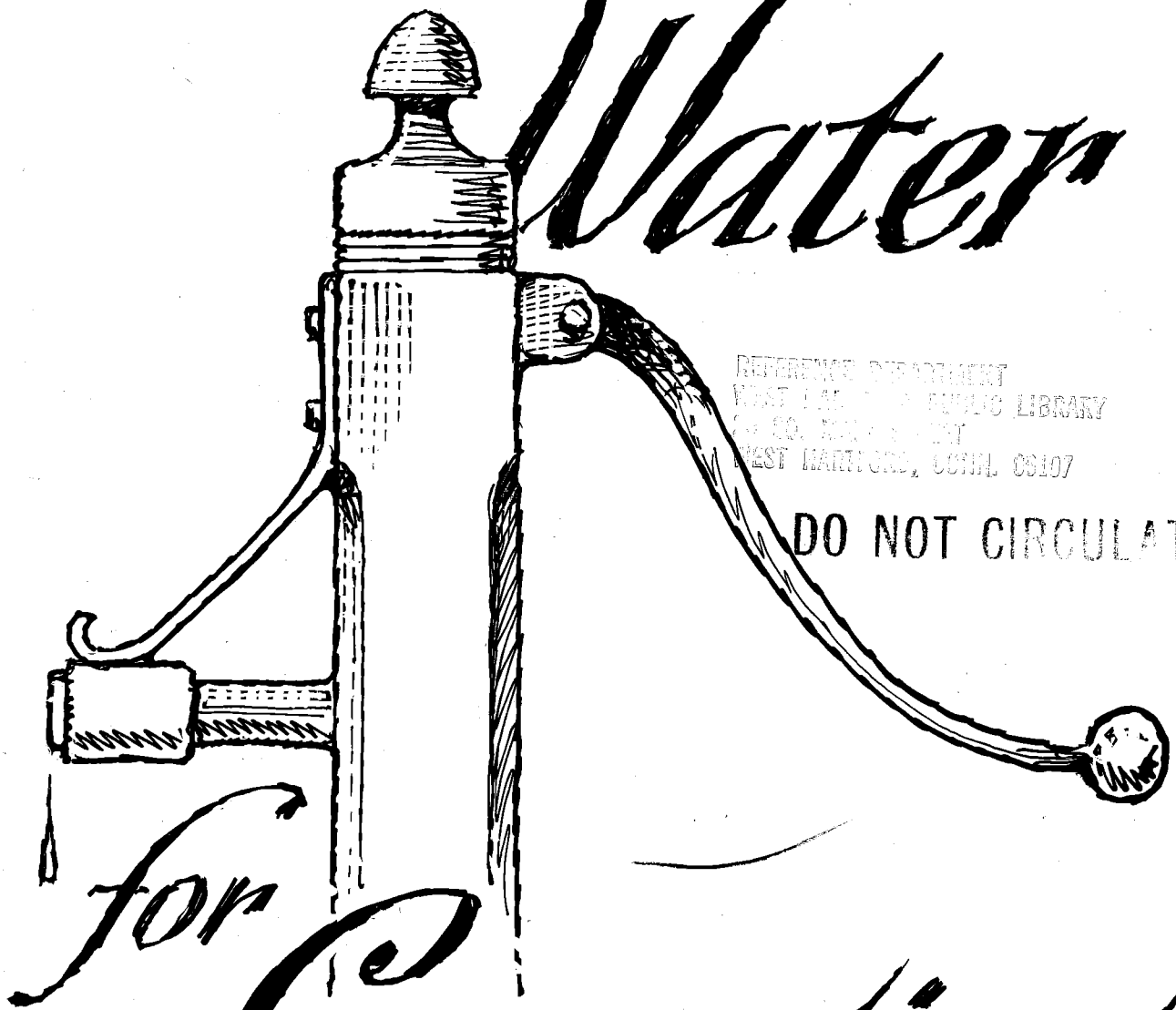
CLEAN Water for Connecticut



AN ACTION PROGRAM

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May 1966

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Ellsworth S. Grant, Vice Chairman
Richard Martin, Executive Secretary

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John Lyman, Jr., Vice Chairman

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Public Health

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PREFATORY NOTE

Clean water for the people of Connecticut -- clean water in abundance for all to use and enjoy. Clean water that will help us to preserve the natural beauty we cherish in our state -- clean water that will help us to achieve the economic growth to which we aspire.

That is the aim and the purpose of this report.

In October of 1965, one hundred citizens from all walks of life in our State responded to a request from Connecticut's Governor John Dempsey to join a "Task Force called together to examine the pollution problem that we know exists and tell us the best, quickest, and most efficient and economical way to eliminate it."

Literally thousands of voluntary citizen hours were spent during the ensuing six months by ten subcommittees in examining every aspect of this complex question.

Gradually the dimensions of the problem began to emerge.

First of all, it is clear that Connecticut is generously endowed with water -- in natural rainfall and in the water that flows in our streams and rivers. The supply of water in Connecticut is more than sufficient to sustain the near doubling in population and the associated industrial growth expected over the balance of this century. In contrast to less fortunate parts of the nation, we have no permanent problem with the <u>quantity</u> of our water. Our problem -- and one that is now at a critical stage -- is with the <u>quality</u> of our water. In short: water pollution.

The essence of the water pollution problem in Connecticut -- and elsewhere -- has been stated with such clarity and succintness by the League of Women Voters of the United States (in Facts & Issues Pub. No. 309, November 1965) that it is worth repeating here:

> "Water pollution is not so much a water problem as it is a people problem. As people buy more and more products to satisfy their needs and desires, pollution from agriculture and industry mounts. As people continue to move into cities and suburbs, pollution from sewage is increasingly concentrated. As more people seek outdoor recreation, their sheer numbers degrade the quality of the water they crowd to enjoy. It is this increase in population, in urbanization, in production and consumption that makes water pollution a major issue."

The magnitude of the problem -- present and future -- in Connecticut can be assessed from the following estimates deduced from available data.

+ Although more than ninety percent of the effluent from municipalities and industrial operations receives treatment of some kind, only about one-half of the municipal sewage and one-quarter of the industrial effluent is <u>adequately</u> treated.

+ The inadequately treated municipal waste discharged into Connecticut waterways is the equivalent of one hundred million gallons per day of raw sewage. The industrial wastes discharged into our rivers and streams is the equivalent of another hundred million gallons per day of untreated industrial effluent.

+ If the reasonable assumption is made that future water use in Connecticut will keep pace with projections of national usage published in the Report of the Select Committee on National Water Resources (86th Congress), doubling of the municipal waste and a several-fold increase in industrial effluent can be expected within the next thirty-five years.

Long before this level of water use is attained, the citizens and industries of Connecticut will have learned to accept the principles of renovation, reuse, recirculation and redistribution of our water resources.

In the light of the dimensions of the problem sketched above, the Task Force examined the steps that should be taken to contain the problem before it completely escapes control. The following conclusions soon became apparent:

+ The technology exists to clean up Connecticut's waters.

+ The cost -- while appreciable -- is not exorbitant. Studies by the State Water Resources Commission indicate that the cost of constructing needed treatment facilities for municipal waste is approximately $200,000,000, and for industrial wastes $30,000,000 or more. If allowance is made for amortization over ten years, interest, maintenance and operations, this cost averages out to something between thirty and forty cents per hundred cubic feet of waste. This is comparable to the cost of water delivered by a public water system. Literally, clean water is cheaper than dirt!

+ There is a real urgency in getting on with the job -- since annual increases of about five percent in construction costs add more than $10,000,000 to the ultimate bill for each year of delay.

+ New patterns of cooperative effort among several municipalities and indigenous industry, along the lines of the Mattabassett Sewer Authority, offer attractive opportunities to get on with the task -- quickly and economically.

+ There is a growing recognition that, since the problem transcends municipal boundaries, the State has a responsibility, along with the Federal Government, to participate in the funding of sewage treatment facilities. An equitable allocation of costs is 30 percent to the State, 30 percent to the Federal Government and 40 percent to the municipality.

+ It is in the public interest to encourage the construction of private facilities for industrial pollution abatement by appropriate tax revisions.

+ Effective implementation of these steps will require strengthening the institutional instrumentalities within Connecticut and among the northeastern states.

The recommendations in THE ACTION PROGRAM represent the effort by the Task Force to set before the citizens, the officials, the lawmakers and industry of Connecticut the principal elements of a seven-year program that will move our State with deliberate speed toward the goal of quality water suitable for public water supply, industry, agriculture, recreation, and propagation of fish and wildlife. Moreover, we believe that adoption of these recommendations will make it possible for municipal or regional, public or privately owned water supply systems to assure adequate clean water supplies for many years to come.

In addition, many thoughtful comments and suggestions are contained in the separate reports of the Subcommittees, included in Appendices to this Report. They may be obtained by writing to Commissioner Joseph N. Gill, Department of Agriculture and Natural Resources, State Office Building, Hartford, Connecticut 06115.

Thomas F. Malone, Chairman
Connecticut Clean Water Task Force

THE ACTION PROGRAM

The Connecticut Clean Water Task Force

RECOMMENDS

To the Connecticut General Assembly

1. Grants-in-aid from the State to municipalities of 30 percent of the cost of construction, reconstruction and enlargement of sewage treatment plants, sanitary sewer interceptors and necessary appurtenances, including systems to separate storm water runoff from sanitary sewers but excluding street sewers and collecting sewers. Planning costs of a project are to be considered part of the project cost for grant purposes. Grants to be increased to no more than 40 percent of the cost for facilities shared by two or more towns or provided by an intertown or metropolitan district where joint action is economically desirable and beneficial.

   (Comment: The benefits of clean water are statewide and should be paid for in part by the State.)

2. Prefinancing by the State of Federal Government grants to municipalities whenever necessary to assure the municipalities of the full State and Federal assistance when they are prepared to start construction. Planning costs of a project are considered part of the project cost for prefinancing purposes.

   (Comment: Grants from the Federal Government depend on annual appropriations. Prefinancing permits construction to go forward on the State's schedule. Municipalities will need to borrow only for their share of the cost.)

3. Advances by the State to municipalities for the preparation of construction plans and specifications for sewerage systems, up to six percent of the estimated cost of a project. This planning advance to bear no interest and to be deducted from the subsequent state grant for construction.

   (Comment: Municipalities will be enabled to proceed promptly with engineering plans without waiting for loans from the Federal Government. Six percent of the estimated project cost will carry planning to the grant stage.)

4. Municipalities -- to be eligible for the State grant and for the prefinancing of the Federal grant -- must have completed all necessary planning and engineering, received approxals from the appropriate State and Federal agencies and start construction on a date specified by the State Water Resources Commission in accordance with a schedule aimed at completion of all treatment works by December 31, 1974.

   (Comment: This provides a seven-year program, under the assumption that the legislation becomes effective upon passage.)

5. Authorization by the State of the issuance of $150 million of bonds, to be sold as needed, to finance State grants and to prefinance Federal Grants.

   (Comment: Amortization in ten years with interest of 5 percent would entail a gross annual cost of $20 million, including prefinancing of Federal Grants.)

6. Revision of the State Corporation Business Tax to permit a one-year write-off of the cost of construction, reconstruction and enlargement of waste treatment plants or installations and appurtenances and to become effective starting with the calendar year 1967.

   (Comment: So that industry will not be taxed for non-productive investment.)

7. Revision of the State Sales and Use Tax to exempt materials and equipment purchased, directly or by contractor, for construction, reconstruction, enlargement and operation of an industrial waste treatment plant, installations and appurtenances, starting with the calendar year 1967.

   (Comment: To relieve industry from this tax for non-productive spending.)

8. Availability of State and Local Redevelopment Funds for industrial relocation to facilitate waste treatment within the State of those industries unable to deal properly with wastes in their present location.

   (Comment: In some instances, pollution abatement can be combined with other advantages to industrial operations.)

9. Revision of the Statutes concerning water pollution control to enable Connecticut to adopt, before June 30, 1967, water quality standards and criteria applicable to Connecticut waters, including but not limited to interstate waters or portions thereof, and to provide a plan for implementation and enforcement of such criteria. In accomplishing this revision, the General Assembly should consider, among other things, the following objectives:

   a. Leave the State clearly with the burden of proof to show pollution;

   b. Relieve the State from the burden to prescribe specific method of treatment of wastes;

   c. Relieve the State from the burden of proof that the cost of adequate treatment is reasonable and equitable,while recognizing that they are factors which must be considered.

   d. Authorize the Commission to issue permits to all polluters within six months of effective date of the law, and fix a time limit for each permit, with due regard for the degree of pollution and complexity of the problems;

e. Leave the Commission's right to seek redress in Court against any polluter whose permit has expired or who has not complied with an order;

f. Leave the polluter with the right of appeal to a Court on grounds of legality or equity;

g. Authorize the State Water Resources Commission to require construction or installation of means of preventing intermittent or accidental pollution.

(Comment: A new legal approach to water pollution may be required, geared to the efficient utilization of the water resources in an industrialized and densely populated State. The attention of the General Assembly is invited to the possible need for expansion of existing legislation into a water rights code tailored to the needs of the State.)

10. Authorization for the State Water Resources Commission to appoint hearing examiners to conduct public hearings on matters before the Commission relative to pollution or otherwise, and make findings of fact to the Commission for its decisions.

(Comment: The non-salaried Commissioners should not have to take from their daily schedules as many hours as will be required under the proposed program.)

11. Study of the organizational structure of the Water Resources Commission and of the State Health Department in the light of requirements that will be placed upon them by the program proposed by the Task Force.

The Connecticut Clean Water Task Force

URGES

The Governor and the Legislature

To encourage or authorize (as may be appropriate) the State Water Resources Commission :

12. To develop water quality standards which would satisfy an ultimate objective for all Connecticut water that the quality shall be not less than that suitable for recreation (including bathing), irrigation, agricultural uses and industrial cooling and processing, good fish habitat, good aesthetic value and, where practicable, not less than acceptable for public water supply with filtration, disinfection and other reasonable treatment methods.

In achieving this objective the standards of quality established should be such as to protect the public health and welfare and enhance the quality of water with due regard to the need of water for public water supplies, propagation of fish and wildlife, recreational purposes, agricultural, industrial and other legitimate uses. Furthermore, any

plan for implementation and enforcement should give due consideration to the general economic feasibility of complying with such standards and must, of necessity, satisfy due process of law.

(Comment: It is the sense of the Task Force's recommendation that the attainment of the highest degree of water quality consonant not only with the varied uses listed above but also with technological advances in water pollution treatment should be Connecticut's objective. The Task Force further urges that there be periodic review of the standards for the purpose of enhancing water quality.)

13. To develop comprhensive long-range plans for dealing with the problem of improving water quality in the face of an expanding demand for water for public water supply, industry, agriculture, recreation,and propagation of fish and wildlife and to coordinate these plans with other planning activities in the State and in New England.

(Comment: There has been no attempt to measure total future needs in the State and the Region and the diversity of public and private agencies makes planning difficult but, because of this diversity, essential.)

14. To maintain a comprehensive file of sewage and industrial waste discharge to waterways and of potential accidental discharges to waterways, whether treated or untreated, as well as dates and results of periodic inspections, with a summary report to the Governor at least annually, including the reports from the State Health Department.

(Comment: To provide a continuing review of the results to achieve Clean Water.)

15. To expand initially its staff threefold over the present force to provide for periodic inspection of sewage and waste discharges and treatment plants, for classification of waterways, for sampling, and for review and approval of plans for construction of treatment facilities, and for long-range planning.

(Comment: To correct a long-standing deficiency and to implement the Clean Water Program.)

16. To establish realistic salary schedules for professional and technical staff, comparable to those prevailing in the Federal Government and in other states.

(Comment: To attract the quality and quantity of staff required.)

17. To adopt a training program for engineers and technicians in nearby institutions.

(Comment: To maintain a high caliber staff after it is acquired.)

18. To budget appropriate funds for research and necessary consulting services.

    (Comment: To provide resources for the required studies and flexibility in proceeding with the task.)

To encourage or authorize (as may be appropriate) the State Health Department:

19. To expand its program of Regional Health Centers to provide assistance to local health directors and planning and zoning officials.

    (Comment: It is expected that these facilities will also be available to personnel of the State Water Resources Commission.)

20. To maintain a comprehensive file of community sewage discharges to waterways, both treated and untreated, and of the dates and results of periodic inspections, with a summary report to the State Water Resources Commission at least annually.

21. To expand training programs for sanitary engineers at qualified institutions.

22. To budget as appropriate, in the Bureau of Sanitary Engineering, for the increased activities involved in this program.

The Connecticut Clean Water Task Force

RECOMMENDS

To Connecticut Members of Congress

23. Support for proposals for a six-year, $6 billion Federal program of grants for sewage treatment plants as provided by S.2947 with the additional funds to be allocated to the states on a population basis and with all project ceilings for grants to be eliminated when the State matches the Federal grant and each pays a full 30 percent. We urge that provision be made for the Federal grant to be paid directly to the State for any prefunded payment by the State.

    (Comment: To meet the actual needs if the Federal Government is going to make a substantial contribution to the pollution control problem.)

24. Support for proposals for Federal corporate income tax changes to authorize three-year write-off of the cost of constructing or installing equipment for the treatment of industrial wastes, this write-off to include construction or installation commenced or completed during 1966.

25. That Federal funds be made available for industrial relocation within the State when this is the most practicable remedy for water pollution.

26. Support for enactment of the program proposed by Senator Ribicoff to establish the Connecticut River National Parkway and Recreation Area (S. 2460).

The Connecticut Clean Water Task Force

URGES

The Governor and the Legislature

27. To take steps with appropriate states to include Connecticut River in the Federal Program under Title I of the Clean River Restoration Act of 1966 (S. 2987).

(Comment: To join with adjacent states in seeking a solution to a common problem.)

The Connecticut Clean Water Task Force

URGES

28. Water Using Industries to make a real effort to understand the need for state-wide pollution control, to employ such engineering assistance as it may require, to use the advisory services of the State Water Resources Commission and to install and operate such waste treatment facilities as are necessary.

The Connecticut Clean Water Task Force

URGES

29. Connecticut municipal officials and voters to make a real effort to understand the need for state-wide pollution control, to employ such engineering assistance as it may require, to use the advisory services of the State Department of Health and of the State Water Resources Commission and to install and operate such waste treatment facilities as are necessary.

30. That municipalities review carefully the possibilities contained in Chapter 103 of the General Statutes for financing municipal sewerage system components and for cooperating with industry to abate pollution by domestic sewage and by industrial wastes. Municipalities making agreement to treat industrial wastes should reserve the right of supervision of installation and operation of any pretreatment at the factory necessary for protection of sewers, treatment plants and appurtenances.

31. That municipalities establish or revise zoning ordinances that will protect adequately private and public water supplies and domestic sewage disposal.

The Connecticut Clean Water Task Force

URGES

32. The State Highway Department and all municipal street and highway departments to use great care in handling and controlling road oils, tars, road sand, road salt and chemicals mixed with salt to facilitate storing.

SIMPLIFIED JOB DESCRIPTIONS FOR SUBCOMMITTEES

Sources of Pollution	Classify pollution by general types and name reports that list individual sources (Bibliography).
Public Health	Using classification from Subcommittee on Sources of Pollution, indicate which general types have adverse effect on public health.
Fish, Shellfish, Waterfowl and Recreation	Using classification from Subcommittee on Sources of Pollution, indicate which general types have adverse effect on the various categories of sport fishing, commercial fishing, shellfish, waterfowl and recreation.
Technical Advances for Pollution Control	Using reports of Subcommittee on Sources of Pollution and Subcommittee on Fish, Shellfish, Waterfowl and Recreation, summarize existing methods of control of pollution and the prospects of improved or new methods of control with comments as to the effectiveness of each in preventing adverse effects.
Economics and Finance	Collect information on the value of clean water for various domestic, agricultural, commercial, industrial and recreational uses and data on the cost of construction and operation of pollution control methods.
Water Law and Legislation	Prepare summary digest of present pollution control laws and subsequently draft such legislation as may be necessary to implement recommendations.
Federal Relations	Collect information as to available financial or other assistance from the Federal Government.
Institutional Relations	Collect information as to the activities of interstate agencies and of neighboring states as to their pollution control programs.
Administrative Policies and Practices	Review current pollution control practices and suggest the cost of a complete program spread over six years.
Information	Collect information from other subcommittees, edit, collate and distribute it through the many channels of reaching the general public.

COMMITTEE REPORTS

COMMITTEE ON SOURCES OF POLLUTION

COMMITTEE ON SOURCES OF POLLUTION

Considerable information has been assembled during the past fifty years by Connecticut Departments concerned and by numerous industries and organizations relating to sources and types of pollution. Frequent references are made to basic data and to the magnitude and opportunities for future program planning and action, as considered in various Task Force reports, besides the following facts and observations:

Types of Pollution

DOMESTIC SEWAGE
- Formal Sewer Systems
- Individual Buildings
- Boats, commercial and pleasure
- Combined Sewer System Overflows

INDUSTRIAL WASTE
- Continuing
- Occasional - by design
- Occasional - accidental

PETROLEUM PRODUCTS
- Stored
- Transported

PESTICIDES
- Spraying
- Wash off land
- Industrial

STORM WATER RUNOFF
- Road Oils and Tars
- Road Sanding and Salting
- Surface Wash

It is estimated that sewage discharged into waterways (treated, partially treated and untreated) is equivalent to a discharge of 100 million gallons per day of raw sewage and that industrial wastes discharged into waterways is equivalent to a discharge of 100 million gallons per day of untreated industrial wastes.

Bibliography

For detailed data as to individual sources of pollution see:

1. Waste Water Disposal
   by Connecticut Industries
   Inventory as of January 1, 1961
   (has been updated and is on punch cards)

2. Tabulation of Sewage Treatment Plants, January 1966.
   State Department of Health
   (available from State Department of Health)

Members of Committee on Sources of Pollution

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Robert B. Taylor, Sanitary Engineer, Water Resources Commission
William S. Wise, Director, Water Resources Commission

COMMITTEE ON PUBLIC HEALTH

COMMITTEE ON PUBLIC HEALTH

Polluted water is an extravagance that Connecticut can no longer afford. The Subcommittee on Health of Governor Dempsey's Task Force for Clean Water has studied the adverse effects of polluted water on the health of Connecticut citizens. Pollution falls into four main types: bacteria and viruses causing such illnesses as typhoid, cholera, polio, dysentery, and hepatitis; toxic chemicals; thermal changes; and radio-activity. The presence of any of these substances is of vital concern when the use of this water becomes harmful to health and well being.

The major sources of pollution consist of sewage from domestic systems, buildings, commercial and pleasure boats, unsatisfactory combined sewer and storm-drain overflows, industrial toxic chemicals, oils and petroleum products transported or stored on waterways, pesticides from local spraying or surface wash-off, and storm-water runoff including road oil, tar, sanding and salting materials.

The Public Health Committee believes that water pure enough for bathing can be properly treated to make it potable for drinking. Such treatment will include filtration, taste and odor control, fluoride addition, disinfection and corrosion control. Some industrial processes may need additional purification procedures.

The total 5,000 square mile area of Connecticut will have doubled its population in forty years, producing an average density of a thousand people per square mile and eliminating most of the rural areas. Rural water must be maintained pure at the same time that polluted water becomes purified.

The Subcommittee believes that there is sufficient authority and power in the State Department of Health, the Water Resources Commission, and in local health departments to clean up polluted water. Lack of money and sufficient skilled personnel has prevented the full application of these laws.

To clean up and maintain rural watersheds, small communities must be educated in proper sewage disposal. Subsurface systems are needed by rural people. Suburban areas need sewer treatment plants. Urban areas need properly operated treatment plants and separation of storm-drain systems from sewer systems.

Maintenance of clean water will be a continuing program. Control of water pollution should start immediately. Proper surveillance of new and old installations is needed. Minimum needs for local communities include planning and zoning boards, sewer ordinances, and services of a sanitary engineer.

Industries that pollute water with industrial wastes should assume the chief responsibility for elimination of that pollution. Such companies are more cognizant of the volume of water and extent of pollution that they create, and they should be urged to take the initiative in its proper treatment. During the search and development of a new industrial process, a major concern should include a study of waterborne waste production and how such pollution can be eliminated. It will then be a simple step to design an adequate treatment process which can be submitted to the State Water Resources Commission for examination and approval.

To enforce these laws a much larger staff of sanitary engineers and other trained personnel will be necessary, and training programs by various educational institutions need to be enlarged and strengthened.

Therefore, this Subcommittee on Public Health recommends the following steps for the abatement of pollution of Connecticut's waters:

1. The achievement of a water quality standard which will promote healthful conditions and protect against the transmission of disease.

2. The further development of regional offices of the State Department of Health with an enlarged sanitary engineering staff.

3. Considering the recreational uses of water, presently unspoiled and unpolluted waterways and watersheds should be so maintained for possible future water needs.

4. The provision of state funds to aid in the planning and construction of new community sewage treatment plants, and in the improvement of existing ones, similar to the present federal program of assistance.

5. Integration and regionalization of sewage disposal systems between communities for more efficient treatment.

6. The consolidation of communities and towns into regional water systems on the same watershed to improve the availability of clean water for all.

7. The provision within a community for a greater cooperation for coordinated planning of both the delivery of water and the removal of sewage.

8. The development of a coordinating state agency to deal with the problem of the delivery of water and sewage removal. For instance, such an agency would have authority to secure sites for future water sources and hold them until needed by individual water utilities, both public and private, possibly under the "Open Space Program". Its board would be made up of representatives from the State Department of Health, State Water Resources Commission, State Department of Agriculture and Natural Resources, municipal and privately owned water utilities, and the State Development Commission, so that duplication of effort and conflicting concepts would be eliminated.

9. The intensified research and improvement in the overall handling of sewage, including secondary treatment, chlorination, and removal or treatment of storm water overflow from sewerage systems.

10. The expansion of training programs for sanitary engineers at qualified institutions with the recruitment and training of more technicians and sanitarians, and the upgrading of their professions so that their standing and income compare favorably with those of other branches of engineering.

11. The early compliance of State Agencies with the provisions of the Federal Water Quality Act of 1965.

These concepts should be developed now because it is the opinion of this committee that Connecticut will need its rivers for water supplies within the next ten years. The Connecticut River has been used to supply the City of Hartford with water. It can be made to do so again.

Members of Committee on Public Health

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Professor Stanley Wedberg, Vice Chairman
Mrs. Charles S. Rust, Secretary
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David Wiggin, Director, Sanitary Engineering Division, Health Department
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COMMITTEE ON FISH, SHELLFISH, WATERFOWL AND RECREATION

COMMITTEE ON FISH, SHELLFISH, WATERFOWL AND RECREATION

1. Significance of Hunting and Fishing in Connecticut

Sport Fishing

a. Sport fishing in Connecticut is an important form of outdoor recreation for both sexes of every age class.

b. License sales have closely followed population increase. Licenses are required for all persons 16 years of age or older; however, owners and lessees of property are exempt when on their own property and no license is necessary for sport fishing in the marine district.

c. In 1964, 112,121 persons, or about 4½% of our population were licensed to fish. Considering all who fish but for some reason are not required to have a license, it is evident that about 8% of our people are fishermen.

d. Figures supplied by the 1960 National Survey of Fishing and Hunting lead us to estimate that Connecticut anglers spend in excess of $13 million annually in pursuit of their sport and own over $10 million worth of fishing equipment. The intervening years since 1960 have witnessed an expanding economy and it is quite probable that the above figures are now very much on the low side.

e. Population projections indicate that by the year 2,000, Connecticut's population will have doubled, yielding a population in excess of five million. We can reasonably expect that the number of people who go fishing will continue to closely follow this increase in population so long as the State provides clean water accessible to the public. This could mean that by the year 2,000 close to one-half million persons will seek outdoor recreation in the form of sport fishing. The need is evident and must be satisfied.

f. Interest in our marine waters is increasing. In 1964, based on information supplied by the 1960 National Survey of Fishing and Hunting, it seemed reasonable to assume that 120,000 sport fishermen fished in salt water. We believe that in the year 2,000 this figure may approach 250,000. Thus, approximately one-half of all people who sport fish will pursue their sport in our marine waters.

Commercial Fishing

a. It is difficult to develop figures which will adequately reflect the significance and value of our commercial fisheries as they relate to our inland and marine waters. Further, it is impossible to separate the truly commercial fisherman from one who harvests the product solely for his own use or that of his friends.

b. In 1965, some 1,800 persons held varying types of commercial fishing licenses in the marine and inland districts; however, only about 350 are truly commercial fishermen.

c. There are 60 licensed shad nets on the Connecticut River belonging to 50 operators. The average annual retail value of shad harvested commercially over a three year period was $194,449, which when capitalized at four percent, represents a value of $4,861,225. There is reason to believe, however, that the actual harvest is at least 50% higher than the reported catch. Thus, an appropriate expansion of the harvest is reflected in a revised capital value of $7,291,837.

It is interesting to note that the average annual value of the sport shad fishery for a three year period was $225,403. This value is gained by assigning a reasonable value to the harvested shad and the fishing trip. Capitalized at four percent, this sport fishery represents an investment of $5,635,075.

Thus, the total annual value of the Connecticut River shad fishery represents an investment of $12,926,912.

d. The 1964 Annual Report of the Bureau of Commercial Fisheries, U.S.D.I., places the value of Connecticut's commercial fishing industry at $1,488,000. This figure, however, does not reflect the production of Connecticut's 43 licensed commercial fish hatcheries nor the operation of 77 licensed bait dealers.

Hunting

a. In 1964, 60,488 persons were licensed to hunt in Connecticut. In addition, about 10,000 minors went afield with licensed hunters and an estimated 1,000 adults hunted on their own property and thus did not buy a license. Thus, the approximately 71,500 people that hunt represent about 2½% of our population.

b. Interest in gunning waterfowl is reflected in the sale of 8,097 Migratory Bird Hunting Stamps during fiscal year 1963.

c. Application of the 1960 National Survey of Hunting and Fishing indicates that Connecticut hunters own about $5.5 million worth of hunting equipment and spent about $7 million annually in pursuit of their sport.

License Revenue

Total revenue to the Board of Fisheries and Game for 1965 exceeded $726,000 to which the sale of sporting licenses contributed approximately $618,000. Revenue funds supplemented by direct general fund monies are utilized to implement the programs of the Board which serve the non-sportsmen as well as the sportsmen. The need for and value of these programs to the State as a whole are now recognized at all levels.

Trout Liberation

Sport fishing is a water-based form of outdoor recreation dependent in large part upon water quality. All species of fresh water fish are eagerly sought; however, the demand for trout far exceeds the capacity of our waters to supply this favored species, and the Board of Fisheries and Game supplements natural populations by liberating hatchery-reared trout. During the 1965 season, 471,132 adult trout were liberated in Connecticut waters. Most of these fish were reared in the State's three trout hatcheries while the remainder were purchased from commercial fish hatcheries. The number of trout liberated must and will be increased to meet the ever-increasing demand. It is important that our waters be maintained in a condition capable of supporting fish life and thus able to meet the accelerated demand for sport fishing as a recognized form of outdoor recreation.

2. Jurisdiction over Pollution

Many people will undoubtedly be surprised to learn that while the Board of Fisheries and Game is the state agency assigned the responsibility of perpetuating our fish and wildlife resources, as well as providing for public recreation in the form of sport fishing and hunting, the agency has virtually no jurisdiction over pollution. Action is after the fact - this means that the agency is limited to taking action only after a fish kill has occurred. The fact that a stream is so polluted that it can no longer support fish life is not legal justification for action - a fish kill must take place. Further, even if the source of pollution is known, the Board cannot force corrective measures. As a matter of policy, all complaints of pollution are immediately referred to the Water Resources Commission, which agency has full responsibility over all matters of pollution.

The responsibility of the Board of Fisheries and Game is contained in Sec. 26-119 of the General Statutes, Revision of 1958. The pertinent portion of this section states, "No person shall place in any lake, pond or stream, any lime, creosote, or any other drug or poison injurious to fish". Sec. 26-141 provides that any person who violates the provisions of Sec. 26-119 shall be fined not more than $100 or imprisoned not more than thirty days or both. Enforcement is difficult under the wording of the section and past attempts at enforcement have been less than rewarding. It is now the general policy of the agency to press for damages rather than criminal action.

3. General Types of Pollution and Effect on Fish and Wildlife

a. Gravel operations and highway construction (siltation)

1. The introduction of excessive amounts of silt into a stream system may cause injury to the gills of the fish resulting in death by suffocation.

2. Muddy, turbid waters encourage the establishment of undesirable fish populations, such as carp and suckers, at the expense of more desirable game species.

3. Excessive silt loads can and do alter the character of the stream bed and pond bottom. Streams become shallow, water temperature increases, spawning areas disappear, bottom organisms necessary as a source of food vanish and thus the ability of the stream to support fish life is significantly lowered. The always progressive movement of a pond toward a marsh is accelerated and fish populations shift from cold to warm water species.

4. Silt deposited on an existing marsh may alter the vegetative composition of the marsh, reducing available food and cover, and may cause a direct loss to resident wildlife by nest destruction.

b. Domestic Pollution (organic)

1. Some degree of organic pollution may be tolerated and is in fact beneficial, resulting in an increase in basic fertility, thus providing nutrients necessary for plant life and stimulating an increase in bottom organisms. Beyond a given point, organic pollution is detrimental in that it favors undesirable fish populations, undesirable plant communities and heavy organic pollution can result in the death of all fish and invertebrates important as food for fish.

2. Organic matter in the process of decomposition utilizes available dissolved oxygen. Given the right set of conditions, this process can reduce or even deplete available dissolved oxygen in our waters below the amount necessary to sustain fish life. Strictly in terms of general reference, 4 ppm. is necessary and 6-7 ppm. is considered optimum.

   The fish kills which occurred last summer in the Connecticut River and Wethersfield Cove were attributed to an oxygen deficiency resulting from a combination of high temperature, heavy pollution load and low river flows.

3. Organic pollution may at times result in heavy algal blooms which normally are not harmful to fish life but which under certain conditions may suddenly die and in the process of decomposition cause an oxygen loss which in turn will cause the death of the fish population.

4. Domestic pollution is in any case aesthetically undesirable and knowledge of its presence decreases public interest in fishing opportunity and lessens the desire to eat any fish which might be taken. The Connecticut River is perhaps a classic example of this psychological block in that the river supports a fish population which, except for shad, is truly under-exploited by the sport fishermen.

c. Industrial Pollution (chemical and solid waste)

1. Waste products from woolen and paper mills react in much the same way as domestic pollution.

2. The direct effect of chemical pollution upon aquatic life is normally felt sooner by the respective organisms; however, the invertebrate population may be affected before the resident fishes.

3. Chemicals can result in a direct kill of fish or may contribute indirectly to a kill by reducing the ability of the stream to support fish life. For example, the discharge of iron oxide into the Norwalk River is not toxic to fish life but acts to blanket the stream bottom, effectively removing many species of invertebrates utilized in the food chain.

4. High concentration of detergents act to degrease waterfowl, allowing water to penetrate to the body. The bird cannot stay afloat and during severe weather may freeze.

5. Undesirable changes in plant communities may result from various types of chemical pollution. The impact on the wildlife species in this case is represented by a loss in available and desirable food and cover.

6. Certain chemicals are toxic to birds and mammals. Fur bearers which frequent an aquatic habitat can suffer pelt damage.

d. Industrial Pollution (petroleum products)

1. Limited spillage of petroleum, as normally occurs in Connecticut results in little damage to fish life; however, excessive amounts can kill fish and aquatic organisms. A heavy surface film prevents atmospheric oxygen from entering the water and under certain conditions can lead to a fish kill. Further, a surface film effectively controls insect populations which are utilized as food by many species of fish.

2. Oil spillages many times will have a semi-permanent effect with slicks re-appearing after each rainfall and change in water level.

3. Most petroleum products are fatal to exposed invertebrates and to the eggs of waterfowl and shore birds which may be covered as the result of an oil spill. Sport fishermen insist that oil imparts a peculiar flavor to fish which when cooked is noted by the nose even before the taste buds. Trappers have on occasion reported an economic loss because of oil damaged pelts.

4. Oil spillages are particularly damaging to waterfowl especially if spills should occur during periods of wintering concentrations. Oil mats the feathers rendering the bird flightless and allows freezing water to penetrate to the body surface causing death by freezing. Even traces of oil on the feathers of ducks can cause the death of these birds simply by their ingesting the oil while in the process of preening feathers.

e. Hot Water

Hot water is a form of pollution which has only recently been recognized and which certainly represents a new and virtually unknown concept in the need for pollution control. Effects are difficult to assess because each must be related to the volume and temperature of the effluent and the characteristics of the environment into which it is being discharged. Some generalizations of possible effects are cited briefly.

1. Discharges beyond the ability of the receiving body to assimilate the flow without significant physical change can change the entire aquatic community.

2. Direct kills of fish and other aquatic organisms will result if the temperature of the environment exceeds the tolerance of individual species.

3. Adverse water temperatures, if not causing death, can weaken the fish, thus reducing its resistance to other adverse environmental conditions.

4. Increases in water temperature reduces its ability to hold dissolved oxygen. Further, temperature tends to increase the rate of oxidation of organic matter which in turn may contribute to a serious oxygen deficiency.

5. Changes in the composition of fish populations in the immediate area may be expected.

4. Findings and Recommendations

Our fish and wildlife populations and the environments that sustain them represent valuable natural resources which of necessity will continue to increase in importance. Public interest in fishing, hunting, and observing wild creatures in general and the economic and therapeutic values derived from the pursuit of these sports demands that their future be insured.

Pollution of Connecticut's waters does in fact represent an ever present threat to the continued existence of our fish and wildlife resources and the varied forms of outdoor recreation which these resources support. Our streams and water bodies are polluted. Pollution-caused kills of fish and wildlife do occur. Some waters have not supported fish life for many years while other stream systems, such as the Willimantic River, have only recently become so polluted as to require that trout stocking be curtailed or eliminated.

Recreational fishing, commercial fishing, and to some extent hunting, can and must be maintained regardless of population explosions, industrial expansion and urbanization of rural areas. We believe the technology required for adequate pollution control is available. It is imperative that immediate action be taken.

We recommend:

1. The 1967 General Assembly, by joint resolution, establish and adopt a pollution abatement policy for the State, clearly setting forth the intent of the General Assembly and the objectives of its pollution control program.

2. Existing statutes governing pollution be reviewed and revised so as to be consistent with legislative policy and to adequately recognize and protect our fish, wildlife and water resources.

3. The Water Resources Commission be equipped with the proper tools; specifically, adequate personnel and funds as necessary to carry out its legislative mandate.

Subcommittee on Fish and Wildlife

Norman C. Comollo
Walter A. Czaja, Jr.

The Connecticut Shellfisheries

Of all the problems that face the Connecticut shellfisheries, the pollution of our rivers and coastal waters has become the most serious. To appreciate this condition and its consequences, a brief review of the shellfisheries would be appropriate. The estuaries and wetlands form a complex ecological system contributing to a wide variety of fish and wildlife. The shellfisheries, as a part of such a complex, are in even more delicate balance in the requirements of a productive environment. Type of bottom, temperature, salinity, water quality and food are all key factors in the shellfish cycle and the variation of one is critical to growth and reproduction. Connecticut was gifted in this unique combination of conditions and became one of the most prolific shellfisheries in the world. At the turn of the century, production was over 3,000,000 bushels of mature and seed oysters annually. At today's prices, this would be about $40,000,000 per year. The decline of this industry as a result of the environmental change along our shorelines has been at the cost of over a billion dollars in shellfish during the past 65 years. Add to this the loss of the commercial fin-fishery that also prospered in Connecticut during this period as well as the future cost of pollution abatement and we have already had a costly lesson in the value of our water resources.

Today, the shellfisheries consist of approximately 64,000 acres; 46,000 acres under State control and 18,000 acres as Town ground. Of the total, 42,000 acres would be considered oyster grounds, 20,000 acres of clam ground and 2,000 acres of escallop ground. The industry is generally located from Greenwich to Branford and has been the area of the greatest loss of productive ground. The area from Branford easterly to Stonington is predominately a sports shellfishery with a small commercial shellfishery in a number of towns. The total product value for both the commercial and sports shellfishery for 1964 is estimated at two and a half million dollars. Production for 1965 will be lower due to the continuing decline in water quality from pollution and the lack of fresh water run-off.

Water Pollution

The shellfisheries require a high standard of water quality for propagation and more importantly, the protection of the consumer. Approximately 35% of all shellfish grounds are closed by the State Department of Health for poor water quality. This closure prohibits direct marketing of oysters or clams from specific areas, however, transplanting to clean water is permitted under strict control. There are two general kinds of water pollution creating problems for our industry. Untreated or partially treated domestic sewage deposits sludge on shellfish grounds and removes dissolved oxygen from the water making the grounds useless for production. Domestic sewage also carries various types of human diseases which can be transmitted to humans. Industrial pollution is the disposal of wastes from manufacturing plants but it is convenient to broaden the definition to include other chemical pollutants such as detergents, oil, pesticides, chemical fertilizers and weed killers that wash into our streams. The effects of industrial waste are varied and often not as clear cut as domestic sewage. It is also economically impossible to remove the last trace of waste materials from processed water and harmful pollution can originate even in the presence of acceptable standards which might be met by a manufacturer

in waste treatment. Considering the nature and extent of our polluted waters, it can be assumed that our major estuaries such as the Thames River, Connecticut River, New Haven Harbor and the Housatonic River can never be totally reclaimed for direct market shellfish. The remaining clean waters of Connecticut are therefore a valued asset and one objective of any program should be to prevent their loss to pollution as well as to support pollution abatement to bring other areas to more acceptable standards.

Shellfish Future

The future of the shellfisheries is at best a challenge. There is a correlation in the loss of the former productive natural environment in our estuaries and the decline in shellfish production. Pollution, filling of the marshlands, dredging for gravel or fill, navigation projects, erosion and hurricane protection have all taken their toll. The environment that created our 3,000,000 bushel years is gone and although there are still thousands of acres of good shellfish bottom available, their ability to produce is keyed to a declining water quality. Recent developments in oyster and clam culture offer a number of areas of promise to the shellfish industry. Chemical control of some predators is now practical. The process known as depuration is available for the cleansing of shellfish from moderately polluted areas and would open thousands of acres of clam grounds. The artificial spawning of oysters and clams is in operation on Long Island and has excellent commercial possibilities, however, natural spawning will still be needed for volume production and our future shellfisheries will be dependent on a clean and productive water quality.

The Problem

The shellfisheries of Connecticut are an example of the consequences in the misuse or destruction of our irreplaceable natural resources. The hub of the commercial shellfisheries was the area between New Haven and Bridgeport. The Bridgeport beds were supported by the Housatonic River and the history of this river and its pollution is well known. The New Haven Harbor is the terminal for three rivers: the West River, the Mill River and the Quinnipiac River. All of these streams are polluted in varying degrees and the Mill River is the classic example of our stream pollution problem. Its putrid grey green waters can only be appreciated by sight and smell. Pulp plants are the major contributors to this pollution and action by many local groups to correct the flagrant violation of pollution laws and common sense is defeated by political expediency and a negative attitude on the part of enforcement officials. The law is being compromised for jobs and our public waters have become their private sewer. The Mill River demonstrates how little protection the public interest and our water resources have had wherever the problem is basically the law and its administration. The emphasis being placed on pollution abatement is essentially a technical matter, however, without the strong support of our laws to prevent the increase of sources of pollution, much of any program would be wasted and therefore, our recommendations are limited to what we consider the first phase of a clean water program.

RECOMMENDATIONS:

1. Revise existing statutes, to clarify and define the State role and responsibility in water pollution control with emphasis on a policy that will recognize, preserve and protect the public interest in fish, wildlife and water resources.

2. The prevention and control of pollution is primarily a public health problem and should be under the jurisdiction of the State Health Department as a direct line responsibility. The professional stature of the State Health Department would minimize the pressures of special interests. Today, the dual role of the Health Department and the Water Resources Commission apparently provides a grey area of jurisdiction which is both a refuge and a source of inaction in resolving our pollution problems in the best interests of the public.

3. The existence of the Clean Water Task Force is an indication of what has not been done and on the basis of past experience, we have no assurance of what will be done to implement and support pollution prevention and abatement in the waters of Connecticut. A citizen's group to oversee a clean water program for a period of five to ten years might be appropriate and would at least provide support and strength to the actions of any State agency that will in time be in charge of millions of dollars in pollution abatement programs.

Subcommittee on Shellfisheries

J. Richards Nelson
R. I. Metcalf
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Recreation

Recreation is a water "use" which cannot be measured in gallons but is increasingly important, nevertheless. Demand for water-oriented recreation is surging ahead of population growth. People have a nature desire to swim, fish, go boating, picnic, and camp beside water, or just to look at it. They can fulfill these desires only if the water is of high quality aesthetically and is free from health hazards.

Population growth is naturally a chief influence in increasing the demand for water recreational activities in this state. Connecticut, by 1980, it is estimated, will have one million more people than now currently reside in the state. By the year 2,000, only 34 years off, demographic projections estimate that the state's resident population will soar to between 5½ to 7½ million. No validated statistics are available on the number of people served by present water resources. It is noted, however, that all of the state's water resources, including pools, beaches and lakes, received over four million day visitors and campers. Of this number, over 2/3 of the visits were made for swimming purposes. Projections from a recent national survey indicate that Connecticut can anticipate a 50% increase in swimming participation within the next ten years. The potential of using undeveloped land along the coast should not be overlooked.

An increasingly affluent society and available water resources has made boating a major recreational activity in the state. There are approximately 54,000 registered motorboats over 5 H.P.; and an estimated total number in the state, including sail and smaller motorboats and other types of small crafts, at 125,000. This means that at least 400,000 persons in the state go boating based on the accepted standards of the National Association of Engineering and Boat Manufacturers that each boat is regularly used by at least three persons. It is also estimated that state boat owners spent $75,000,000 on boats, motors, and trailers in 1965. Projections made for the impact of boating as a recreational activity indicate that with the annual growth rates of 8% on coastal waters and 2% per year on inland waters, would normally increase boat use to 35% over the next five-year period.

The obvious contact activities of fishing, boating, water skiing, swimming, and scuba diving immediately come to mind. How about summer picnics at shoreside parks with a cooling breeze for comfort, an evening around a campfire at a shoreside campground, sports activities such as crew or yacht regattas. There is a certain peace which comes upon the individual who pauses to gaze at a flowing river. We must assume that nothing distracts the attention of this viewer. No untoward noises, no gaseous bubbles, no oil-slicked surface, and no decomposing organic material or other vile items. Any smoothly flowing waterway serves to heighten an aesthetic appreciation of the work of nature.

The Federal Advisory Council on Policy Governing the Water Pollution and Public Health Aspects of Outdoor Recreation in 1964 issued a declaration of policy which we feel is most worthy of repetition and endorsement.

1. Development of comprehensive river basin water pollution control programs that protect outdoor recreation water uses.

2. Development of a set of principles for water quality standards for outdoor recreation, wildlife, fish, and other aquatic uses which could be applied where appropriate for the particular use involved.

3. Development of water quality monitoring systems for the protection of outdoor water recreation areas.

4. Development of water pollution research programs benefiting outdoor recreation, wildlife, fish, and other aquatic life.

5. Provision of technical services in water pollution prevention and control relating to outdoor recreation, wildlife, fish, and other aquatic life.

6. Development of a set of principles as guides to the adoption of local standards by the appropriate State agencies to protect outdoor recreation uses and Federal investments for recreation in water resource developments.

Subcommittee on Recreation

William J. Pitkin
Paul J. Bourgeois
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Mrs. Frederick Daggett
Samuel Pear

Members of Committee on Fish, Shellfish, Waterfowl and Recreation

J. Richards Nelson, Chairman
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Resource People

Theodore B. Bampton, Director, Board of Fisheries and Game
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COMMITTEE ON TECHNICAL ADVANCES FOR POLLUTION CONTROL

COMMITTEE ON TECHNICAL ADVANCES FOR POLLUTION CONTROL

Introduction

The Technological Advances Committee was charged with summarizing existing methods of control of pollution and the prospects of improved or new methods. Effective methods already exist for the treatment of sewage and disinfection of the effluent. There exists, however, a need for the development of effective methods for removing mineral salts (phosphate, nitrate) from treated sewage effluent to avoid nuisance algae blooms in the receiving body of water. Most industrial wastes require different methods for treatment; our survey of industrial wastes and methods of treatment reveals that effective methods are generally available. On that basis, the prospects for new or improved methods were investigated largely to find more economical and hence more acceptable controls. Realistically, the prospects for important break-through yielding great savings are not bright, and therefore we recommend prompt application of existing methods.

Existing Methods of Waste Treatment

In Table 1 we list the commonest kinds of industrial wastes in Connecticut and the general methods of treatment that are applicable.

The books and technical articles listed in the Bibliography at the end of this report give the details on wastes and applicable treatment methods.

Mr. William S. Wise, Director of the Water Resources Commission, in his address to the first meeting of the Governor's Task Force, stated that delays in achieving a fuller degree of cleanliness in our streams "have not been due to deficiencies in the technological field. We have ample 'know-how'". The Technological Advances Committee is in general agreement with that statement, but we hasten to point out that much research is still needed to improve the effectiveness of waste treatment methods and to decrease the cost of treatment.

We hopefully note the following quotation from a resolution adopted by the Board of Directors of the Manufacturing Chemists' Association, Inc. in 1961:

> "Proper control of stream pollution is one of the obligations of responsible corporate citizenship.
>
> Avoiding harmful pollution is a necessary business cost. As with other aspects of business, qualified people with clearly defined responsibilities must be assigned to bring and keep pollution under control.
>
> Adequate waste control facilities must be included in the design and construction of new plants and major additions to existing plants.
>
> Adequate research in waste control is essential."

Surely with no serious technological inadequacy and with an enlightened and determined public, there is strong reason for hope of progress and strong justification for impatience if progress is delayed.

Recent Technological Developments

Time has only permitted a brief and superficial review of recent technological developments, but the aggregate experience of the Committee makes it unlikely that any really important new developments have been overlooked. Some special recent developments and some special technical problem areas deserve comment. First, it should be pointed out that the "complete" treatment of sewage yields an effluent which is practically ideal for promoting algae blooms in impounded waters. Wherever the effluents from municipal waste treatment plants are discharged to lakes or ponds prolific growths of algae are a potential consequence. These growths are no hazard to health, but they are unsightly and can very seriously degrade the value of waters for recreation. Two techniques for "tertiary" treatment of sewage need further study; both are in operation in other states and more complete information on cost and effectiveness should be forthcoming in the near future. Spray irrigation of treated sewage effluent on forest soils is being evaluated in Pennsylvania. A summary description of the process by Dr. Paul Waggoner of the Connecticut Agricultural Experiment Station follows.

TABLE 1

COMMON CONNECTICUT INDUSTRIAL WASTE WATERS

Type	Method of Treatment
Plating	Oxidation of cyanide, reduction of hexavalent chromium, pH adjustment, precipitation of metals
Textile	Chemical treatment and/or biological treatment
Milk and Food Products	Biological treatment
Tanning	Chemical and biological treatment
Paper	Chemical and/or biological treatment
Steel Pickling	pH adjustment, precipitation of iron
Laundry	Chemical or biological treatment
Meat and Poultry	Chemical and/or biological treatment
Non-ferrous Metals	Reduction of hexavalent chromium, pH adjustment, precipitation of metals
Emulsified Oil	Chemical treatment
Sand Washing	Settling
Chemical Manufacture	Various; see references for discussion of methods

"The renovation of sewage by soil both avoids dumping organic matter and algal nutrients in streams and lakes and recharges the ground water. Essentially, the renovation is accomplished by irrigating field or forest, summer or winter, with 50,000 gallons of effluent per acre of land per week. In Pennsylvania, where the State University has undertaken a large pilot operation and investigation, water samples collected at a depth of 4 feet with suction lysimeters indicated the removal efficiency was about 97% in removing detergents and more than 99% in removing phosphates. Most of the nitrogen is also removed. To maintain this efficiency it may be necessary to harvest a crop from the land or move to other land after a few years. Clearly this scheme would improve our forests by increasing soil fertility and moisture. Soil differences between Pennsylvania and Connecticut should make the system at least as effective here."

The investigation in Pennsylvania is described in the recent issue of Saturday Review. (S.R. Oct. 23, 1965:802). It is also described in:

Kardos, L. T., W. E. Sopper, and E. A. Myers, 1965. Science for the Farmer. 12(4):4.

Pennypacker, S. P., 1964. Renovation of Sewage Effluent through Irrigation. MS thesis. Penn. State U.

Sagmuller, C. J., 1965. Mixed Oak, Red Pine, and Old Field Responses to Irrigation with Sewage Effluent. MS thesis. Penn. State U.

Another approach to tertiary sewage treatment is the use of alum floc for the adsorption and removal of phosphate from sewage effluents as described by Rohlich et al., in Wisconsin (Reference 1). A small treatment plant using the same principle at the Hotchkiss School is currently being evaluated by the Water Resources Commission. Perhaps the first pilot plant in the world of the Rohlich process was built in Connecticut at the Newtown State Hospital, but it was destroyed in the flood of 1955 before it could be fully evaluated. An advanced treatment plant constructed at Lake Tahoe, California, has attracted special attention. In that plant, alum in conjunction with an organic polyelectrolyte coagulant is used for phosphate removal. A recent article describing the process has been appended as Annex 1.

A third recent development in sewage treatment involves the use of powdered coal as a filter medium. A complete technical report on the process pilot plant is expected in the near future. A summary of our present knowledge of the process is attached as Annex 2. A representative of Rand Development Co. appeared before the Muskie Committee in June, 1965 and his statement is available in the Congressional Record.

Another recent development deserves a brief comment even though only very limited information on the process is available. The Broadway Research and Development Corporation of York, Pa., has announced the successful application of a mechanical process (vortex separation and foam separation) to dye wastes, laundry wastes, paper mill wastes, and community wastes. According to the Broadway Corp., approval for the construction of a one million gallons per day plant for a textile dying firm in Bluefield, Va., has been obtained from the State of Virginia. The process should be effective wherever gravity separation will work and where the basic process needs mechanical enhancement. A cost/effectiveness evaluation of the Broadway process should be carried out, of course,

before any further conclusions are drawn concerning its general importance.

A great deal of public concern has resulted from the appearance of unsightly foams on rivers and streams and in public and private well waters. The major cause of foam has been stated to be alkyl benzene sulfonate (ABS) detergents, which are quite stable against bacterial degradation in the ground and in sewage treatment processes. The phenomenon has been investigated in Connecticut (Reference 2) under the auspices of the Water Resources Commission. The American soap and detergent industry, alarmed by the public's reaction, undertook a public information campaign (Reference 3) and voluntarily switched over from ABS to linear alkyl sulfonate (LAS) detergent production for the domestic market. These so-called "soft" detergents are readily degraded in soil and sewage treatment processes. As of June 1965, the switch-over in the industry was complete. ABS and other "hard" detergents, however are still being produced for industrial use, and it would be a mistake to relax our vigilence over the presence of surface-active (detergent) materials in ground and stream waters. An interesting by-product of the detergent story has been the development of foam fractionation or separation as a waste treatment method. In this case, the surface-active substances concentrated in the foam fraction are recycled to enhance foaming and stripping in the separation towers.

In recent years, a process called extended aeration (Reference 4) has been widely applied in small and medium-sized installations (schools, motels, shopping centers) where space is limited. A number of companies offer complete package plants for extended aeration treatment of sewage. The process gives very good reduction of soluble organic matter and good stabilization of sewage solids, but some claims concerning digestion of solids in the process have been exaggerated. With effective final separation of solids, however, extended aeration gives a very high degree of treatment in a limited space. The process should be more widely applied for organic industrial wastes.

One of Connecticut's most valuable resources is its shoreline. Pollution of harbors and estuaries should, consequently, be of prime concern. There are distinct technological aspects to waste disposal in salt water compared to fresh water. It is, therefore, especially important to point out that the U. S. Navy has most recently undertaken a thorough review of waste disposal at all of its installations and has initiated the development of a shipboard treatment plant for use in harbors by all Navy vessels with a crew of forty or more. The system being developed unfortunately will only provide the equivalent of primary sewage treatment. The Navy should be urged to undertake the development of shipboard plants providing more complete treatment. Tanker ballast water must be discharged in port under certain circumstances. The federal Maritime Administration has sponsored the development of an oil-water separator for use on tanker ballast water. Another recent advance in sewage treatment for coastal cities is electrolysis of sea-water-sewage mixture. Electrolysis is used in a Norwegian coastal city with reported success and the process is under investigation under the U.S. P.H.S. program on Advanced Methods of Treatment. The economic feasibility of electrolysis is dependent upon the availability of a suitable coastal construction site and the cost of electric power.

Most treatment processes are fundamentally separation processes in which a quantity of waste solid matter (sludge) is produced. The disposal of sludge will become an increasingly important problem as the total volume of wastes

treated in the state increases. The disposal of sludges in a sanitary land fill can result in pollution of ground water. Certain sludge wastes are readily disposed of by composting with rubbish; which serves a dual purpose, but which must be carefully monitored from the health and nuisance standpoint. Odors, vermin, and ground and/or surface water pollution can result from badly conceived or badly managed composting projects. incineration of sludge provides for ultimate disposal and the small quantity of ash produced can be readily handled. A smoke and odor nuisance can result from improper practice and in some cases, combustion must be promoted and supported by gas or fuel oil. The disposal of sludge is an important part of any waste treatment scheme; the possibility of integrating sludge disposal with rubbish disposal should be examined for all large waste treatment plants.

Pollution abatement is a complex multifactor problem. Through the use of the electronic digital computer the "general systems" approach to water resources management is now a reality and the multifactor problem of water resources management is amenable to solutions. The over-all plan of operation of the Water Resources Commission should be a general systems approach rather than a case-by-case, "brush fire" basis. The resource management approach will permit the full utilization of modern technology resulting in lower over-all cost of clean water.

Governor Dempsey, in his founding address to the Clean Water Task Force asked,

"Is it accurate to say, as some experts do, that by the year 2,000 we will have to use the Connecticut River for drinking water?" An off-hand or undocumented answer to that important question would be a very risky basis for water resources management planning, but the fact that no proven answer can be given at this time demonstrates the need for study of water needs, water quality, and water supplies, including the cost of pollution abatement and the development of new water supplies.

A general review of waste treatment technology reveals that an effective method can be devised for practically any industrial waste. Wastes that are variable in time, as from certain chemical manufacturing plants, will pose a special problem, only to be solved by taking waste treatment into account at the onset of process design and by making provision for isolating certain refractory wastes.

Methods for effectively treating municipal sewage with some quantities and types of admixed industrial wastes are well developed. Under the U. S. Public Health Service Advanced Treatment Methods Research Program, methods are being developed for treating sewage to the degree that it is acceptable as feed water for a public water supply filtration plant.

In other words, only in very rare cases is there a technological barrier to effective waste treatment.

The cost of treatment, on the other hand, may often pose a problem. Our general knowledge, moreover, warns us that it would be unrealistic to expect a

breakthrough in technology that would yield great and widespread cost savings in either sewage or industrial waste treatment.

Education and Training

The magnitude of the national as well as local task of providing clean waters in America is so great that clearly there will exist a great demand for trained personnel in the field. It is an unfortunate fact that sanitary engineering offers lower salaries than the other engineering specialities, e.g., mechanical, electrical, chemical engineering. Students who aspire to the engineering profession, consequently most often choose other specialities. There seems little that we in Connecticut can do to correct that inequity, but a study of ways to attract students to professional training in sanitary engineering is needed, and in addition, man-power utilization in the field should be studied to determine the extent to which non-professional personnel can be substituted for engineers. Of course, the shortage of trained personnel is not restricted to the professional level; technicians are also needed.

Annex 3 includes a description of the University of Connecticut Institute of Water Resources by its director, William C. Kennard, who is also a member of this committee. It also includes a letter to committee member S. L. Grapnel from Mr. Lucian Lombardi, Chief of the State Department of Education's Bureau of Technical Institutes. The letter lists courses in Civil Technology offered at the Hartford Institute and it expresses the Bureau's willingness to provide additional specific programs as required. Annex 3 also includes a general statement on education and training by W. C. Kennard, which this committee endorses. Annex 4 is an extract of information from a letter from Chas. Pitkat, Secretary of the Connecticut Water Pollution Abatement Association, an organization of waste treatment plant operators. Training, education, and qualification or certification are problems called out in the letter.

Research and Development Program

Pollution abatement is only one of many functions of the Water Resources Commission, albeit one of the most important. The Commission staff has recognized the importance of research to its mission, and in the past, research projects of modest scope were carried out at the Hall Chemistry Laboratory at Wesleyan, the Chemical Engineering Laboratory at Yale, the Department of Health Laboratories, the Agricultural Experiment Station at New Haven, and at private laboratories under Commission sponsorship. The Commission has never maintained laboratory facilities of its own. The Commission professional staff is thoroughly satisfied that its R&D function has been and can be carried out effectively by outside laboratories working under Commission staff monitorship.

This committee endorses that recommendation and we would point out that establishing a laboratory for the Commission staff would involve a large capital expenditure. What is more important, in any case, is the growth of the R&D effort to a stature commensurate with the magnitude of the problem. At a minimum, the Commission staff should have one full-time senior professional member whose sole function would be the planning of an R&D program and budget, the evaluation of research proposals, and the monitoring of the projects being executed by the various contractor laboratories. Another important function of the research officer would be the surveillance of water and waste management research

throughout the country and the world through the periodical literature and through professional contacts with state and national leaders in the field. The program in Connecticut should emphasize special technical problems in the state, fill the recognized gaps in the national picture, and also take advantage of special research interests and background of outstanding Connecticut research scientists.

Annex 5 is a copy of the plan for classification of rivers adapted by the New England Interstate Water Pollution Control Commission. The plan gives explicit standards of quality and definition of five classes based on those standards. The plan is included in this report as an example of the type of framework or guidelines that should be applied to a research and development program in order to enhance its practical value. In other words, the development of a method of treatment or an improvement in a method should be evaluated in terms of its ability to up-grade a certain stretch of water with respect to one or more specific standards. In fact, the use of such a plan as a guide to drawing an R&D program, might be the most important use for the plan.

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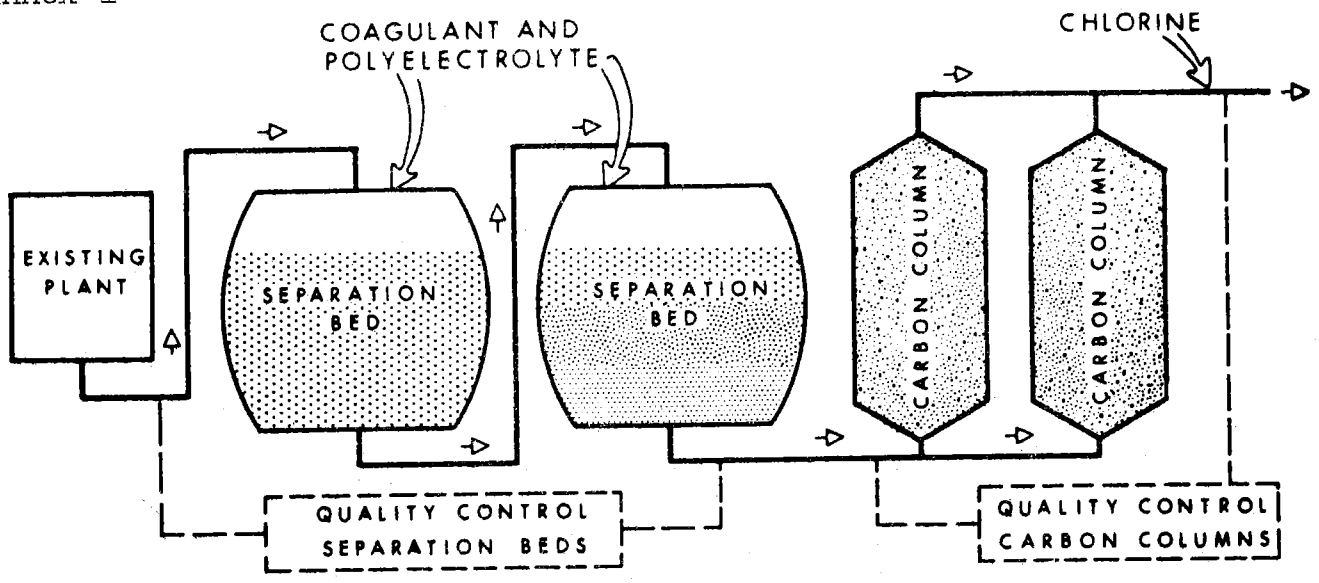

The separation beds operate in series while the carbon columns operate in parallel; note the quality-control arrangements for both units.

A new design combines the latest scientific and engineering advancements to produce . . .

The Most Complete Waste-Water Treatment Plant in the World

By **WIN PRIDAY**, Utility Manager
HARLAN E. MOYER and **RUSSELL L. CULP**, Consulting Engineers

The effluent from the South Tahoe Public Utility District's new water-reclamation plant will be superior in quality to that of most natural surface waters and as clear as the best well water. Free of algae-growing phosphates, the water will not foam and will be sparkling clear, colorless and odorless. Tertiary treatment with separation beds, inverted filters and carbon columns provides the final degree of purification to an already excellent activated-sludge plant effluent. The accompanying table (page 126) summarizes the estimated over-all plant efficiency.

The District serves the Bijou, Calif.-Lake Tahoe area, a famous all-year recreational region. The prime importance of aesthetic considerations in the area demanded a much higher degree of water purity than results from standard treatment processes. Cornell, Howland, Hayes & Merryfield, consulting engineers in Corvallis, Ore., designed the plant in cooperation with Clair A. Hill & Associates, civil engineers of Redding, Calif. They based their design on the results of three years of successful pilot-plant studies at the South Tahoe plant, and at waste-treatment plants in Salem, Philomath, and Corvallis, Ore. Financed in part by a water-pollution-control grant from the U. S. Public Health Service and by District revenues, the plant is being built by the California Filter Co. of Burlingame, Calif., and will be completed early in 1965.

While the consultants designed the plant for a capacity of 5.0 mgd, the present contract covers only one-half the capacity, or 2.5 mgd. The process consists of coagulation and absorption in two separation beds operating in series followed by absorption of dissolved organics and inorganics on granular activated carbon.

The tertiary plant includes four Worthington pumps:

- **A variable-speed, secondary plant effluent pump of 1,900 gpm at 120-foot-head maximum capacity.**
- **A 3,800-gpm-at-720-foot-head wash-water supply pump.**
- **A 500-gpm-at-140-foot-head surface wash pump.**
- **A 600-gpm-at-160-foot-head plant-service water pump.**

Chemical feed equipment consists of two Wallace and Tiernan metering pumps able to deliver at a maximum rate of 50 gallons per hour; two similar pumps that add a poly-

(Continued on page 126)

Mr. Priday serves as manager of the South Tahoe Public Utility District, Bijou, Calif. Messrs. Moyer and Culp are members of Clair A. Hill & Associates and Cornell, Howland, Hayes & Merryfield, consulting engineers, respectively.

Estimated Over-All Plant Efficiency

Quality Parameter	Raw Waste-Water Influent	Water-Reclamation Plant: Activated-Sludge Plant Effluent	Water-Reclamation Plant: Separation-Bed Effluent	Water-Reclamation Plant: Chlorinated Carbon-Column Effluent
Biochemical oxygen demand, mg/l	180-400	15-35	5-20	2-5
Chemical oxygen demand, mg/l	200-500	40-60	20-30	2-10
Suspended solids, mg/l	160-350	5-20	<0.5	<0.5
Turbidity, units	50-150	20-60	<0.5	<0.5
Phosphates, mg/l	15-35	10-30	0.4-2.0	0.2-1.0
A.B.S., mg/l	3-8	3-6	1-3	0.05-0.5
Chlorine demand, mg/l	Over 50*	10-50*	5-10	1-3
Coliform bacteria M.P.N./100 ml	15,000,000	150,000	15	<2.2
Color, units	high	high	20-50	<5
Odor	odor	odor	odor	odorless

* High dosages and long contact required to obtain true chlorine residual.

(Continued from page 123)

electrolyte; and two existing chlorinators for post-chlorination. The addition of alum and the polyelectrolyte takes place ahead of each of the two separation beds.

Chemical storage facilities include a 5,700-gallon rubber-lined tank for liquid alum and a 1,200-gallon tank with disperser and mechanical mixer, plus a 200-gallon feed tank for the polyelectrolyte.

The separation beds are each 10 feet in diameter by 38 feet long. These pressure units operate in series. They contain a special media developed by Microfloc Corp. of Lake Oswego, Ore. Arrangement of the filter media from coarse to fine in the direction of flow makes it possible to use the entire depth of the beds to remove and store all of the suspended particles. Through coagulation and absorption, the alum collects turbidity, bacteria and phosphates into a floc that filters out as the water passes through the beds.

The filter rate, at maximum flow, is 5 gpm per square foot. The backwash rate is 15 gpm per square foot or 5,700-gpm flow through the two units in series. Four Leopold rotary filter agitators, seven feet in diameter, wash the filter surface in each bed. The backwash cycle operates automatically, initiated by high head loss or high turbidity in the effluent.

Instrumentation includes a Dall tube and butterfly valve rate-of-flow controller; an instrument to measure and record continuously to tenths of one Jackson Standard Unit the turbidity of separation-bed effluent; and loss-of-head measurement across each bed and across the two beds.

The filter backwash water flows to an 80,000-gallon decanting tank. Decanting of clear water and return to the secondary effluent pond and the return of sludge to the preaerator take place automatically.

Carbon Columns

The two carbon columns, specially constructed to specifications, operate in parallel. Each unit measures 12 feet in diameter by 24 feet high. They provide an effective depth of 14 feet and contain about 1,810 cubic feet of carbon per column. The normal direction of flow is upward, but this can be reversed for flushing the top underdrain and for compacting the carbon bed.

A Dall tube and butterfly valve control the rate of flow in each column. Maximum flow rate equals 8 gpm per square foot of cross-sectional area.

The carbon regeneration process consists of dewatering, thermal reactivation in a Bartlett-Snow-Pacific multiple-hearth furnace, removal of fines and return to columns.

Carbon removal takes place hydraulically in a countercurrent manner via bottom withdrawal. The spent carbon flows to two drain and feed tanks, each having a capacity of about 2,500 pounds of carbon on a dry basis. Two screw feeders and conveyors transport the drained carbon to a six-hearth, 54-inch-diameter furnace. Propane-fired, with afterburner, exhaust scrubber and quench tank, the furnace operates at a maximum capacity of 6,000 pounds (dry basis) per day.

Diaphragm slurry pumps transfer the regenerated carbon to two 2,500-pound-capacity storage tanks. Backflushing through a screen at the top of the tanks removes the fines. The defined carbon flows back to the top of the carbon columns hydraulically. Make-up carbon is also pumped to the top of the columns from a carbon slurry bin.

Besides instrumentation mentioned, the process control includes continuous measurement of:

- **Orthophosphate content of the reclamation plant influent and effluent.**
- **Chlorine content of plant effluent.**
- **Laboratory tests of ABS content of the individual carbon-column effluent streams.**

Presently, the final effluent from the plant is disposed of by spray irrigation on land. However, the governors of California and Nevada agreed that all effluent from the Tahoe Basin ultimately must be pumped out of the Basin.

The plant incorporates some of the latest scientific discoveries in waste-water reclamation. For example, Professor G. A. Rohlich of the University of Wisconsin first demonstrated absorption of phosphates on alum floc, and the Micro-Floc Corp., recently developed the separation beds. The Pittsburgh Chemical Co., under a research grant from the U. S. Public Health Service, developed the granular activated carbon for this purpose.

The granular activated carbon can be regenerated by heating and used 20 times, greatly reducing the cost of carbon treatment. The high efficiency of the separation beds in removing foreign materials also extends the life of the carbon and substantially reduces over-all cost.

The construction cost of the 2½-mgd-capacity plant came to $568,400. This includes some equipment for future expansion to 5-mgd capacity, and carbon-regeneration capacity for a 10-mgd plant. Present estimates indicate that the tertiary-treatment plant can be expanded from a capacity of 2.5 mgd to 5 mgd for about $250,000.

Operation costs are estimated at $64 per mg. With the addition of alum recovery and re-use facilities, the operating costs may be reduced to $36 per mg. These operating costs include the cost of sufficient alum for phosphate removal. Where phosphate removal is not necessary, operating costs may be as low as $25 per mg. ◄◄

Annex 2 28 December 1965

An inquiry was made to the Department of Interior concerning the technical report on the Rand Development Co.'s project on the use of coal as a filter medium for sewage treatment. The report has not been published, but we were referred to Mr. Carleton of the Rand Co. According to Mr. Carleton, Phase I of the project, the laboratory investigation, is complete and the report on the work will be completed late in January. Phase II, the operation and evaluation of a pilot plant, is in progress. Mr. Carleton generously supplied some advance information on the results of Phase I. The treatment process consists of a deep bed of granular coal with optimum size range being plus-60, minus-200 mesh. Both filtration and adsorption are involved in the process. Filtration efficiency is independent of coal type, and a three foot depth is sufficient for effective filtration. For effective adsorption (removal of phosphate, synthetic detergents, and other organic solubles,)an additional eight foot depth is necessary. Raw sewage, primary effluent, and secondary effluent are all effectively treated. With raw sewage, the average removal of BOD and COD is about 70%. Anthracite and bituminous grades of coal do not give any appreciable adsorption; medium and high volatile sub-bituminous grades must be used for that process. In Phase I, a test unit of 1000 gallons per hour capacity was operated over a long period of time. The flow rate in the bed at steady-state conditions drops to about 0.5 gal/min/ft^2 due to the formation of a sludge layer and/or schmutzdecke. Under flow, the ratio of water to coal in the bed is about 5:1. Under settling the bed drains to about a 1:1 ratio. If enough heat is applied to drive off the water, the fuel value of the dry coal is slightly enhanced due apparently to adsorbed organics.

An important feature of the pilot plant is a mechanism for continuously harvesting and renewing the surface of the coal bed.

Mr. Rainey, a Rand executive, testified before the Muskie committee in the recent past,

Please be very sure not to let this preliminary information unduly diminish your optimism concerning the importance of the development. In the first place, I may have misunderstood the facts provided by Mr. Carleton, and in the second place, I have only provided a very fragmentary account of the work with coal.

Richard J. Benoit, Ph. D.
Chairman, Technological
Advances Committee

Annex 3(a)

December 15, 1965

LETTER TO
DR. RICHARD J. BENOIT
FROM WILLIAM C. KENNARD, PH.D.
THE UNIVERSITY OF CONNECTICUT
INSTITUTE OF WATER RESOURCES

The scope of the Institute is defined as follows:

"Research on water in any part of the hydrologic cycle which can be used directly or indirectly by man comes under the purview of the Institute. It includes any study which adds to the knowledge of the quantity, quality, nature, or uses of water, including those designed to provide information on the nature, sources, production, behavior, transport, and conservation of water, including socio-economic aspects, for agricultural, domestic, industrial,municipal, and recreational uses by citizens of the State. The need for bringing the knowledge of many disciplines to bear on the problems facing water development and use is apparent."

The Institute has the following six objectives:

1. To encourage basic and applied research and develop technical competence in the broad field of water resources.

2. To coordinate and sponsor research related to water resources in the several Colleges and Schools of the University.

3. To increase the opportunities for interdisciplinary education and training of advanced students.

4. To sponsor seminars, symposia and other meetings on water resources problems and research.

5. To assist interested and qualified University staff members in obtaining financial support and facilities for water resources research.

6. To sponsor participation of visiting scientists in the water resources research programs.

The Institute is organized with a Director, an Executive Committee consisting of six members of the University staff, and an Advisory Committee consisting of the Deans of the Schools and Colleges involved, together with the Associate Dean of the Graduate School who is responsible for research and development at this University.

Staff members associated with the Institute are responsibile for carrying out the research activities. These staff members who retain appointment in an academic department, are assigned part or all of their research effort to the Institute of Water Resources.

Annex 3(b) Educational Needs of a Clean Water Program

Introduction

Water pollution presently is a serious problem in Connecticut and promises to be of even greater concern as both our population and water use increase. In order to cope with the many problems directly or indirectly related to water quality, a large number of technically and/or professionally trained people will be required. There is now a great shortage of such individuals and steps must be taken promptly if the expanded needs of the future are to be met.

There is at present a broad range of degree, certificate and special study courses designed to train people to meet needs in water quality and related fields. Major colleges and universities in Connecticut now offer programs leading to the baccalaureate degree in areas closely related to water quality. Included are sanitary engineering, hydrology, chemical engineering, chemistry, botany, civil engineering, economics, agronomy, soil science, political science, geology and others. In some of these institutes students can pursue studies in many of these disciplines leading to masters or doctors degrees. Traditionally, emphasis has been given to the engineering aspects of pollution control. While continuing to be important, this must be supplemented increasingly by the work of economists, sociologists, planners, hydrogeologists, political scientists and others.

Needed Activities

To provide additional better educated people in the field of clean water, there will need to be offered a variety of instructional activities such as seminars, short courses, workshops, certificate programs (2 years or less), baccalaureate degree programs, and graduate training leading to M.S. and Ph.D. degrees. It should be emphasized that all of these programs should be conducted concurrently.

Both public and private institutions of higher learning will be involved in educating individuals to meet the projected needs for people trained in water pollution control and related fields; however, the state supported institutions can be expected to make the major contributions since they can be more responsive to needs in the State than privately endowed colleges and universities.

There have been changes in the curricula in colleges and universities to meet the needs and important changes are continuing to be made. For example, in 1964 the University of Connecticut established the Institute of Water Resources, an administrative unit designed to bring together scientists and educators from several schools and colleges to participate in interdisciplinary research and training concerned with the many disciplines which contribute to water resources. Not only must appropriate and meaningful educational programs be developed but also financial assistance must be provided if our most outstanding students are to be attracted to the fields of study related to clean water. Short courses on topics such as sewage plant operations and laboratory control of sewage treatment have been offered jointly by the State Department of Health and the University of Connecticut. Additional specialized short courses of this type should be offered. They should include but not be limited to water quality.

studies biooxidation of industrial water, chemical analyses for water quality, water bacteriology, biological problems of lakes, rivers and reservoirs, biology of stream sanitation, sanitary engineering, sewage plant operations, and water pollution ecology. The course offerings will need to change as needs in the State change.

The State Technical Institutes could play an important role in training technicians needed in anti-pollution work. At the present time in the Civil Technology major offered at the Hartford State Technical Institute, courses are given in chemistry, physics, water supply and sewage, hydraulics and soils. Expanded offerings at this and other Technical Institutes should be considered.

Instruction in water resources use and development at the secondary school level should be encouraged. This could be accomplished by special courses for and retraining of school teachers in biology and earth sciences and by the inclusion of appropriate material in courses offered high school students.

Provisions should be made to have courses given for technicians, sanitarians, scientists, and engineers and other professional people to provide them with the newest developments in the field of water supply and pollution control. Some of these courses could be given in Connecticut; in other cases it would be more desirable and economical to participate in special courses offered by other states and by Federal agencies. For example, the U. S. Public Health Service, although centering its activities in pollution control at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio, offers technical courses, orientation courses, training institutes and technical seminars at many locations throughout the United States which would be of value to people in Connecticut working in the field of water quality. The National Science Foundation has for several summers sponsored 4-week conferences for college teachers. Other examples could be cited.

In order to encourage participation it is suggested that, when necessary, funds be provided to pay costs of attending such specialized courses.

There is a definite need for and trend toward an interdisciplinary approach to training and research in water quality and related aspects. This can be expected to continue and to accelerate.

It must be emphasized that if teaching at these several levels is to be effective it must be undergirded by an extensive and intensive program of research designed both to provide information of immediate importance and to add to the storehouse of fundamental knowledge. It is recommended that state agencies such as the Water Resources Commission and the Department of Health not initiate "in-house" programs of research but that they be given authority and funds to award grants and/or contracts to established research groups to conduct studies needed by them in the conduct of their responsibilities.

In summary, then, the need for individuals trained in one or more aspects of water quality and related subjects will increase tremendously in the future and steps must be taken now to assure that such people will be available in Connecticut. It should be a broad-based effort designed to train people at all levels of technical competence from short courses to certificate programs, to B.S. and advanced degree programs. This expanded educational effort should be

based on an equally increased research effort to provide both basic and applied information. While taking advantage of programs offered by Federal agencies and organizations outside the State, Connecticut should take the initiative in and assume responsibility for the development of strong continuing educational and research programs on clean water and related aspects. To reach these goals the following recommendations are offered:

1. Provide state financial assistance for expanded instructional programs.

2. Provide state financial assistance to students participating in educational programs.

3. Provide state financial assistance for increased applied and basic research efforts.

Prepared February 17, 1966
by W. C. Kennard

STATE OF CONNECTICUT
STATE DEPARTMENT OF EDUCATION
Box 2219 — HARTFORD CONNECTICUT 06115

TEL. 527-6341 EXT.

January 18, 1966

Stefan L. Grapnel, Chief Engineer
Belding Hemingway Company
Central Engineering Department
Putnam, Connecticut

Dear Mr. Grapnel:

Your letter addressed to Mr. Eddy, Chief of the Bureau of Vocational-Technical Schools, has been referred to me for reply. The four State Technical Institutes and their extension centers located throughout the state of Connecticut of the Bureau of Technical Institutes would be very happy to provide any courses that may be required in the field of Water Pollution and Water Treatment.

At the present time in the Civil Technology offered at the Hartford State Technical Institute, we do offer courses in this area such as Chemistry, Physics, Water Supply and Sewage, Hydraulics and Soils. If more specific programs are required, these might be offered as part of our evening program.

I shall be very happy to meet with you and your Committee at your convenience.

Sincerely,

Lucian Lombardi

Lucian Lombardi
Chief
Bureau of Technical Institutes

LL:as

Annex 4

Extract of Information from a letter to Dr. R. J. Benoit, dated March 15, 1966, from Charles Pitkat, Secretary of the Connecticut Water Pollution Abatement Association.

"Connecticut Water Pollution Abatement Association was founded in 1965. The Association has 71 members who are waste treatment plant operators in the state.

The Association's objectives are the improvement of work conditions for operators and the advancement of knowledge and design of treatment plants, improvements in construction, operation, and management of those facilities. The Association holds monthly meetings at which expert speakers are heard and technical ideas are exchanged.

Some problems faced by operators for which solutions are being sought are:

1. Operators usually are not consulted in design and construction of plants.

2. Public ignorance and/or apathy concerning sewage treatment relative to other public services. Local libraries' holdings on the subject are inadequate; the subject is not part of the material presented in public school courses in civics, government, or social sciences.

3. Training of operators has not been formalized. (State Health Department has offered two short courses). Operators are currently examined and certified by the Health Department, but the requirements for certification should be up-graded.

4. Laboratory facilities for plant control are inadequate; many operators are untrained in laboratory methods. The Health Department does not check plant operation often enough, especially where no internal lab checks are possible.

5. Industrial wastes are permitted to be discharged to sewer systems in some cases degrading the treatment.

Members of Committee on Technical Advances for Pollution Control

Dr. Richard Benoit, Chairman
Dr. William C. Kennard, Vice Chairman
Dr. Charles Walker, Secretary
Stefan L. Grapnel
J. L. Kelehan
Manuel Leibert
Donald W. Loiselle
Erle Martin
B. Erik Ohlson
Kenneth Stober
Dr. Paul Waggoner

Resource People

M. Gilbert Burford, Professor of Chemistry, Wesleyan University
Marvin Smith, Sanitary Engineer, Health Department
Dr. Joe Webb Peoples, Director, Geological & Natural History Survey

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

TENTATIVE PLAN FOR CLASSIFICATION OF WATERS

Annex 5

(As Revised and Accepted April 15, 1959)

	CLASS A	CLASS B	CLASS C	CLASS D
SUITABILITY FOR USE				
	Suitable for any water use. Character uniformly excellent.	Suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value. Acceptable for public water supply with filtration and disinfection.	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.	Suitable for transportation of sewage and industrial wastes without nuisance, and for power, navigation and certain industrial uses.
STANDARDS OF QUALITY				
Dissolved oxygen	Not less than 75% sat.	Not less than 75% sat.	Not less than 5 p.p.m.	Present at all times
Oil and grease	None	No appreciable amount	Not objectionable	Not objectionable
Odor, scum, floating solids, or debris	None	None	None	Not objectionable
Sludge deposits	None	None	None	Not objectionable
Color and turbidity	None	Not objectionable	Not objectionable	
Phenols or other taste producing substances	None	None	None	
Substances potentially toxic	None	None	Not in toxic concentrations or combinations	Not in toxic concentrations or combinations
Free acids or alkalies	None	None	None	Not in objectionable amounts
Coliform bacteria	*Within limits approved by State Department of Health for uses involved.	Bacterial content of bathing waters shall meet limits approved by State Department of Health and acceptability will depend on sanitary survey.		

Sea waters used for the taking of market shellfish shall not have a median coliform content 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.

COMMITTEE ON ADMINISTRATIVE POLICIES AND PRACTICES

COMMITTEE ON ADMINISTRATIVE POLICIES AND PRACTICES

RESUME OF RECOMMENDATIONS

a. A material acceleration of the pollution control effort.

b. Adoption by the Water Resources Commission of a detailed program for correction, within the next six to eight years, of significant pollution, taking into consideration current trends in public use, and desire for use, of the waterways of the State.

c. Adoption by that Commission of a continuing planned program for further expansion of water pollution control plants (sewage works and industrial wastes control) to keep ahead of population growth and increased use of streams.

d. Issuance of orders for pollution correction on schedules which are integrated with the detailed programs, persuasion being used in advance of orders, but only for such time as results seem fruitful.

e. Expansion of staff of both the Water Resources Commission and the State Department of Health to a minimum initial level of three times the current available force in order to develop programs and expedite the acceleration of the control effort, with further expansion as necessary when the program is formulated.

f. Adoption by the State of realistic salary schedules for professional and technical staff, comparable to those in other states and for Federal positions, a premise vitally necessary to the recruiting of any qualified personnel.

g. A training program for younger engineers and for technicians, carried out in conjunction with the University of Connecticut or other nearby institutions.

h. Appropriation of funds for research and consulting services when and as necessary in the development and carrying out of initial and long-range programs for pollution abatement.

i. Economic studies by qualified agency of impact of acceleration of pollution control on municipal finance and salability of bonds.

j. Shift of burden of proof on choice of process and design of pollution control plants and apparatus from Water Resources Commission to firms or agencies contributing to pollution.

k. Updating of present permit system and records.

l. The enaction of legislation providing for matching grants by the State of at least 30% of the cost of sewage treatment works.

m. An amplified public information policy for the Water Resources Commission and appropriation of funds therefor.

1. Water Resources Commission

Under Connecticut law the Water Resources Commission is charged with planning and co-ordinating all activities concerning the abatement of pollution. The commission has seven members appointed by the Governor with the advice and consent of the Senate. Section 25-1 of the Statutes provides that the membership of the commission shall be such as to represent the following:

Agriculture
Fish, wild life and recreation
Manufacturing
Electric or Water Utilities
Municipalities
The public at large

Members of the commission serve without compensation and it is empowered to appoint a director and a deputy director.

The Water Resources Commission is empowered to summon to a hearing any persons, firms or corporations causing pollution, there to show cause, if any, why an order should not be issued regulating such pollution. After holding such a hearing, the commission is empowered to issue orders "to use or to operate some practicable and reasonably available system or means which will reduce, control or eliminate such pollution, having regard for the rights and interests of all parties concerned, provided the cost of installation, maintenance and operation thereof shall not be unreasonable or inequitable." (Sec. 25-21, General Statutes)

In addition to its functions in the field of pollution, the Water Resources Commission has been charged with a number of other duties, including approval and inspection of dams, water system extensions, waterfront structures, dredging permits, flood control, tidal protection, beach erosion, certain aspects of navigation, and stream encroachment. Most of these additional functions have been added in the last few decades, and without corresponding increases in appropriation. The result has been that, with no increase in staff, it has been necessary for the commission to divert personnel who would otherwise have been available for pollution control efforts to these newer obligations.

2. State Department of Health

The law provides that the State Department of Health also has jurisdiction over the discharge into the waters of the state of any sewage prejudicial to public health. That department may examine all existing or proposed public sewerage systems and refuse disposal plants and may compel their operation in a manner which will protect the public health and also may order extensions, alterations, and replacement where necessary as a health measure. Plans of all new or altered sewerage systems and refuse disposal plants must be approved by the State Department of Health and, if the effluent or discharge (as it usually must) enters the waters of the state, similar approval must be obtained from the Water Resources Commission. The State Department of Health, in the Public Health Code, prescribes regulations for septic tanks, including construction, specifications, and the relationship of the same to wells and other sources of water and to streams, ponds and lakes.

This dual jurisdiction over sewerage might appear to be unnecessarily overlapping. However, it actually has worked out well. The Water Resources Commission has in all cases issued the orders for correction of municipal sewerage pollution. Its staff have been concerned with the degree and method of treatment necessary to

accomplish the desired correction. The Department of Health engineers have examined the sizing and design of plant units and mechanical equipment, based on their experience in inspecting and observing operation of sewage treatment plants in the State and elsewhere. These two efforts seem to complement rather than interfere with each other.

3. Policy re Orders for Correction

Past policy has been to use persuasion, as far as possible, to induce municipalities as well as private interests to correct pollution. Orders, in general, were issued only when persuasion failed. The results under this plan have been fairly good. Some appeals to the courts, however, have delayed accomplishment of the desired ends for long periods.

Today, the public is much more aware of the ills due to pollution. There is far more interest in, and demand for, corrective measures. It is obvious there must be great acceleration of pollution control programs. Persuasion is probably the best initial step, but only for such minimum time as progress is being made. If the State is to keep up with a program acceptable to the public, orders for pollution correction and for engineering surveys leading to development of correction programs, will be necessary in greatly increased frequency. Inasmuch as more or less frequent appeals to such orders can be expected, the technical data which must be prepared before the issuance of the order for correction, must be complete and, insofar as possible, incontrovertible. An accelerated program cannot be effective unless there is staff available for the engineering, chemical, bio-chemical and bacteriological studies which must be pursued to insure success of orders which may be issued. This today is far from the case.

4. Hearings

As the frequency of orders increases, the number of hearings on pollution matters will correspondingly increase. Because of the very considerable volume of business now requiring hearings, (not only on matters involving pollution but also in connection with the Water Resources Commission's many other functions) it must be assumed that it will become impracticable to assemble even a minimum quorum of the commission for hearings as frequently as the needs of an accelerated pollution program will dictate. It appears, then, that some other procedure is indicated.

It is probable that the best approach would be a change in the statutes governing hearings to provide that the Water Resources Commission could appoint, from their senior engineering staff or otherwise, hearing examiners authorized to conduct the hearings, digest the evidence and technical data submitted, and submit the same, with recommendations, to the commission for action. The commission would thus be freed from the burden of sitting at numerous and often protracted hearings involving much highly technical evidence, but having the benefit of an analysis of the evidence by an expert in the field. The commission then, with a more reasonable expenditure of time, could devote its meetings more to questions of policy which, after all, should be their primary function.

5. Policy re Expanded Program

If the present and probable demands by the public for acceleration of pollution abatement is to be met, the State Water Resources Commission must develop programs and time schedules which will make an expanding effort possible.

Connecticut is fortunate in that the commission, despite a woeful insufficiency of staff, has been able to do so much. The remaining problems are less in number and complexity than in many, if not most of the states. Almost all of Connecticut's municipal sewage is treated in one manner or another. The State Health Department has extensive records of its periodic inspections of the operation and conditions of the sewage treatment plants, and of the laboratory tests of influent and effluent of each plant. Consequently, the degree of removal which is accomplished by each plant is determinate.

A sewage treatment plant is not the sort of affair which can be the subject of a standardized design varied only in size to meet the particular problem. There are various types of plants adapted to different requirements, usually a function of the nature and volume of the stream into which the effluent is to be discharged. Many plants in Connecticut of the "primary" type in which removal of sewage solids is by sedimentation. Others have so-called "secondary" treatment which can be done by several methods. Tertiary treatment is sometimes necessary and, as is to be done shortly through the summer months at the large Hartford Plant of The Metropolitan District, disinfection of effluent by chlorine may be desirable.

The extent, type, and economy of treatment plants for sewage depend on the ability of the receiving streams to assimilate, without deleterious effect, the discharge of treated sewage. This capacity for assimilation varies not only with the quantity of flow in the stream but also with the seasons, water temperature, organic or other wastes from upstream sources, and other factors which affect the quantity of oxygen available in the water.

The Water Resources Commission have developed policies in connection with the type of treatment for stream conditions of various natures. Secondary treatment and even disinfection has been required where conditions warrant. Such policies cannot be static, but must change as thepopulation expands, as more and more recreational and other uses develop. The technical studies and findings leading to the determination of adequate measures of treatment are involved and require staff people of high caliber.

Similar conditions pertain to policies regarding the discharge of industrial wastes. Policies must be expanded as conditions change. Often there must be engineering investigations and laboratory work of considerable magnitude to determine proper standards for various stream conditions.

The State Water Resources Commission must, if it is to keep up with the demand, depend less on persuasive measures and more on a policy of ordering correction when it has determined that remedial remedies are necessary. This premise should apply not only to new pollution control plants, but to additions necessary because of increases in population or because of rising standards applicable to the stream in question. It should also apply to enforcement in the case of faulty operation of existing plants, and to problems involving sewage or industrial wastes.

The result of a "tougher" policy in ordering remedial measures will not only greatly accelerate the pollution correction program, but will insure a more equitable timing and distribution of the burden of the expense of correction than can be accomplished by persuasion. Correction of conditions in given stream can be planned as a whole. Where sewage discharges by several different municipalities occur and where a number of industrial wastes have been entering the same stream, correction can be relatively simultaneous. Nullification of effort by one community or industry would not occur due to reluctance of upstream or downstream neighbors to be persuaded.

It is impracticable to adopt the premise that, in a given number of years, all pollution can be eliminated. Certainly we can plan to have the current situation fairly well remedied in a planned program lasting, say six to eight years. We cannot, however, stop then. Pollution control must be a continuing effort.

We have stated that most of Connecticut's sewage is treated, and when most of our treatment plants were built (or expanded for higher connected population), they were quite adequate for the conditions which prevailed at the time. However, we have more people contributing sewage. Many communities are experiencing rapid growth. Much further expansion will undoubtedly occur. Our standards for water quality are becoming more stringent as the use of our streams becomes more and more widespread. There will have to be further expansion as time goes on. Our water policy, then, cannot be a fixed set of principles. It must be flexible, expanding as the need arises.

Initially, and as time goes on, new and more stringent standards and rigorous programs should be adopted to care for changing conditions and expanding populations.

Unfortunately, unless there is a radical upward change in appropriations for its staff, the Water Resources Commission and the State Department of Health cannot successfully carry on any expansion or acceleration of programs which could be considered adequate.

6. Increase in Staff

The current annual budget available for pollution control efforts amounts to approximately $210,285 of which $128,285 is from State funds and $82,000 is from Federal grant funds.

Based on the gross of $210,285, the budget is divided between the Water Resources Commission and the Department of Health as follows:

	W.R.C.	D.of H.	TOTAL	
Salaries	$ 66,979	$32,596	$ 99,575	
Laboratories	45,705	54,300	100,005	
Miscellaneous	10,705	0	10,705	
	$123,389	$86,896	$210,285	
			- 82,000	Federal
			$128,285	State

Several years ago Mr. William S. Wise, Director of the Water Resources Commission at the request of the commission prepared a report recommending a substantial increase in force and in available money but funds were never received in the Commission's budget. Because of greatly increased public interest in pollution control, these former recommendations have become obsolete. Mr. Wise was requested to submit and has submitted a new estimate of the needs of his department for the staff to engineer an accelerated program in keeping with today's thinking on the subject of pollution.

His recommendation for a Division of Water Pollution Control in the Water Resources Commission's organization would include a Division Engineer in general charge, and a Principal Sanitary Engineer. Under these would be four Senior Sanitary Engineers, each with an assisting Sanitary Engineer. The four Principal Sanitary Engineers would each be assigned a geographical division of the State in which their efforts would ordinarily be concentrated. There would also be one Sanitary Engineer detailed to liaison with the laboratory and a liaison agent familiar with, and to act in, the field of Federal grants. A Chief Inspector would have four inspectors and three junior inspectors in the field and the laboratory would need at least five chemists.

With increases in stenographic, library, record-keeping and filing services and amplified public information efforts, this would be the equivalent of a staff of approximately thirty people, exclusive of the Director, Deputy Director (Chief Engineer), and the Executive Assistant.

Mr. David C. Wiggin, Director of the Sanitary Engineering Division of the State Department of Health, through Mr. Wise, has submitted estimates of the necessary increase in funds which should be available to that department for the increased pace in inspection, examination of plans and health laboratory work to meet the probable demand.

Both Mr. Wise and Mr. Wiggin have included in estimates of the cost of the increased force allowances which would produce a more realistic salary scale without which recruitment would be impossible. This subject will be expanded in a later paragraph. Their combined proposed minimum budget, as affecting these two departments, would be:

	W.R.C.	D. of H.	TOTAL
Salaries	$230,000	$ 70,000	$300,000
Laboratories	75,000	75,000	150,000
Miscellaneous	25,000	15,000	40,000
	$330,000	$160,000	$490,000

This must be considered as a part of the minimum initial annual expenditure for perhaps the first year of acceleration of the pollution control effort, to which other items should be added as discussed later in this report. It would permit the establishment of a realistically scheduled program by the Water Resources Commission, which program, in itself, may raise the budgetary requirements.

7. Salaries as related Staff Expansion

It would be futile to attempt to recruit professional engineers or sub-professional people for an amplified force for pollution control unless there is a realistic approach to the salary question. The other states and Federal government are instituting greatly amplified programs. Local, district, and county agencies are likewise stepping up their efforts. There appears to be considerable discrepancy between our State salary scales in this type of position and those paid by most state or other governmental agencies, including the Federal government, which, through several of its agencies, is extensively recruiting people for pollution control functions.

Enrollment in most of the civil and sanitary engineering courses in our technical schools is on a diminishing trend, yet the demand is increasing. The attraction of the more romantic courses in the nuclear, space, aeronautic and electronic fields draws boys which otherwise might have enrolled in sanitary or civil engineering. The competition salary-wise is acute.

Immediate steps should be taken for a special study of rates for comparable positions in the sanitary engineering field in Federal, state, and other governmental agencies and among consulting engineers. To be realistic, this should be an extensive survey, not only of salaries but including an assessment of the success or failure of recruitment at the rates indicated by other agencies and concerns. Such surveys, while a function of the State's personnel organization, should be conducted so that there would be ample opportunity for liaison with the departments concerned, and with organizations such as the American Society of Civil Engineers, the National Society of Professional Engineers, and the Water Pollution Control Federation, all of which have comparative data which would be helpful in making such a survey.

This survey should be complete in time to use the results in preparing the departmental budgets for the next biennium, or earlier, if additional funds can be allocated in the current budget.

8. Training of Personnel

Even though reasonably adequate salary scales may be attained, the recruitment of highly-trained professional engineers or experienced technicians will be extremely difficult.

Engineering education, with the rapid advance of technology complexities, must necessarily be confined largely to the basic underlying premises and, in a four-year undergraduate course, little time is available for specialization in the student's chosen major. Many technical institutions, including, for instance, Rensselaer Polytechnic Institute, have already gone to a five-year course. Even this extra time does not provide opportunities for much specialization.

It will probably be necessary to give specific training to properly develop younger engineers and most of the technicians. This might best be done in conjunction with the University of Connecticut, or other nearby institutions, with courses specifically designed to give the necessary background to technicians and specialized knowledge to the younger engineers.

9. Research Policy

Funds should be made available to the Water Resources Commission and Department of Health for research. While treatment methods are, in general, known and available for most of our industrial waste and sewage pollution problems, and there is much technical data in the publication of the engineering societies, the Public Health Service and the Water Pollution Control Federation, there will arise from time, problems not now adequately covered in engineering literature, or for which expansion of coverage is necessary to fit local conditions.

As such conditions arise or are anticipated, grants for research might be made to the University of Connecticut, Yale, Wesleyan, Trinity, or other nearby institutions with laboratory and other facilities of a type suitable for the particular research.

10. Consulting Services

Funds for consulting engineering services for out-of-routine problems should also be available when and as necessary, for the development of special testing programs, for interpretation of the results of research or for the solution of special problems which might overtax the time of regular staff.

11. Economic Studies

In the formulation of a long-range program for pollution control and the adjustment of such a program from time to time as population increases, we cannot escape the economic impact that the program will present, not only on industry. but on the taxes to be raised by the State and by its municipalities. The latter, for instance, must issue bonds and pay amortization and interest. It is hoped that Federal and State grants will offset this to some extent, but the relationship of the probable trends in grand lists and debt-limits related to the same must be determined. For instance, will the current amplified municipal debt-limit for pollution control continue to suffice and will our municipalities be able to continue to offer obligations at reasonable interest rates? Will not State participation in the form of matching grants be a prerequisite?

It seems quite necessary that, in the formulation of its future programs, the Water Resources Commission have the advantage of the advice of economists and people in field of governmental finance. This could well be in the form of a research project assigned to one of our universities or colleges.

12. Funds for Research, Consultants and Training

To estimate at this time the costs of the programs for research, consultants and training is not practicable, since some of the costs will vary from year to year, and will vary with the particular problems which may arise as time goes on. The Water Resources Commission should, in preparing its budget for the next and subsequent budgets, take these items into consideration.

13. Policy re Burden of Proof

The present law seems to indicate that the Water Resources Commission is expected to prescribe the method and, perhaps, the details, of treatment plants. It should be permitted to order the corporation (municipal or private) to submit for approval its own plans of method and details with such technical data, tests and analyses as necessary, with adequate provision that, in case of failure so to do, the Commission could proceed with plans or retain consultants to prepare them at the expense of the delinquent corporation.

14. Permits, Records, Enforcement

The present permit and record system, when an amplified force is available, should be up-dated and expanded, and coordinated with periodic and special inspection reports and field tests. It would be profitable to program all data not now on "punch-cards" for one of the data-processing installations now operated by the State or by others, thus making statistics of all kinds very readily available by machine "print-out."

In this connection, immediate report of any significant change in volume, character, dilution, frequency or other factor affecting the discharge of polluting matter should be required of each firm, person or corporation.

15. Federal and State Grants

Federal grants are available through the U. S. Department of Health, Education and Welfare for up to 30% of the cost of sewage treatment plants and intercepting sewers leading to the same, where such works are for the purpose of eliminating existing pollution. Grants of up to 50% are available through the new U. S. Department of Housing and Urban Development for sewerage projects other than treatment works or local lateral sewers. However, Congressional appropriations so far have been far behind the need for country-wide programs. There is not too much certainty that any individual project will be allotted a grant.

In order to relieve some of the burden from the local taxpayers and in recognition of the fact that pollution elimination is of state-wide as well as local benefit, the State should assume some of the expense. The General Assembly should be urged to enact legislation providing for matching grants to municipalities of at least 30% of the cost of treatment works and intercepting sewers leading to the same where such works or sewers are for the elimination or reduction of pollution.

16. Public Information

We have mentioned in an earlier paragraph that the Water Resources Commission should have more funds for public information. When such funds are available, the Commission will have opportunity to, and should, adopt a vigorous policy in the dissemination to the public of information on the necessity for, the progress in, and the results of its pollution control efforts. This program should, of course, include the normal news media, the press, radio and television, together with the use of trained speakers on its staff and wide distribution of its reports and publications. It is essential that the public be well informed if the pollution control effort is to succeed.

Members of Committee on Administrative Policies and Practices

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Joseph Wadsworth, Vice Chairman
Mrs. Elizabeth Roper, Secretary
Wallace Barnes
W. G. Forristall
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Fred Waterhouse

Resource People

William Wise, Director, Water Resources Commission
Leo Donahue, Deputy Commissioner, Finance and Control
George S. Russell, Director, Administrative Services, Agriculture & Nat. Res.

COMMITTEE ON INSTITUTIONAL RELATIONSHIPS

COMMITTEE ON INSTITUTIONAL RELATIONSHIPS

Introduction

We take pleasure in submitting our report to you and the other members of the Clean Water Task Force. The original assignment of the Committee on Institutional Relationships was to:

> become thoroughly familiar with the activities of regional planning agencies within the State that are relevant to the water pollution problem, with the activities of neighboring states, with the work of interstate associations and with other institutional mechanisms to cope with pollution problems.

We have attempted to focus our attention on the inter-relationships of the various public and private bodies which are concerned with water pollution control programs. We have tried to determine whether these inter-relationships are such as to provide effective and responsible pollution abatement. At the same time, we have attempted to avoid matters of finance, technology and law, which are the assigned topics of other committees, except as they may have a direct bearing on organizational structure. We have discovered that it is not feasible to consider water pollution without studying the whole field of water resource management.

Inventory of Water Pollution Control Agencies

With the help of Richard Symonds of the Connecticut Interregional Planning Program and on the advice of William Wise of the Water Resources Commission and David Wiggin of the State Health Department,a Glossary of Agencies Concerned with Water Pollution Control has been prepared.

In the Glossary, which is attached hereto, the 27 public and private agencies which appear to be most directly involved in the various aspects of water pollution control have been identified. Another 36 organizations which have at least secondary interest in clean water have also been itemized on a supplementary list.

The Glossary shows the major functions performed by each of these 27 agencies. The League of Women Voters of Connecticut has prepared a more detailed description of the public agencies which deal with water resources. Their report, Major State Agencies Dealing with Connecticut's Land and Water Use, which has been extremely helpful to the Committee, is appended hereto.

GLOSSARY OF AGENCIES CONCERNED WITH WATER POLLUTION CONTROL

Agency	Sets Standards & Enforces Regulations	Suggests Standards	Prepares Comprehensive Plans	Prepares Water Resource Plans	Designs, Constructs, Maintains Facilities	Provides Financial Assistance	Informs Public	Conducts Research
FEDERAL								
1. Agriculture		X				X		
2. Housing & Urban Development						X		
3. Health, Education & Welfare	X					X	X	X
4. Corps of Engineers				X				
INTERSTATE								
5. New England Interstate Water Pollution Control Commission		a.					X	X
6. Interstate Sanitation Commission	X							
7. Tri-State Transportation Committee			X				X	
8. New England Regional Planning Commission (Proposed)			(X)				(X)	
9. New England Regional River Basin Commission (Proposed) (To be composed of both Federal & state representatives)		(X)		(X)				
STATE								
10. Water Resources Commission	X						X	X
11. Department of Health	X						X	X
12. Boating Safety Commission		X					X	
13. Board of Pesticide Control	X						X	X
14. Interregional Planning Program			X				X	X
15. U Conn-Inst. of Water Resources								
REGIONAL								
16. Metropolitan District Commission				X	X		X	X
17. Mattabassett Sewer District				X	X		X	
18. Ten Reg'l Planning Agencies			X					
MUNICIPAL								
19. 169 Towns (+ Special Districts)	X		X	X	X	b.		

a. NEIWPCC approves water quality standards but has no enforcement powers.

b. Tax exemption of private pollution control facilities.

	Sets Standards & Enforces Regulations	Suggests Standards	Prepares Comprehensive Plans	Prepares Water Resource Plans	Designs, Constructs, Maintains Facilities	Provides Financial Assistance	Informs Public	Conducts Research
PRIVATE								
20. New England Council							X	
21. Regional Plan Assoc.			X				X	
22. Conn. River Watershed Council		X					X	X
23. Farm. River Watershed Assoc.		X		X			X	X
24. Industries					X			
25. Institutions (incl. public)					X			
26. Improvement Associations					X			
27. Water companies				X	X			

Other Public and Private Agencies Interested in Clean Water and Pollution Abatement

Federal and Interstate

Northeastern Resources Committee
U.S. Geologic Survey
Dept. of Interior
Atlantic States Marine Fisheries Commiss.
Conn. Interstate Water Compact Commiss.

State

University of Connecticut
Conn. Agricultural Experiment Station
Park and Forest Commission
Board of Fisheries and Game
Shell Fish Commission
Connecticut Development Commission
Dept. of Agriculture & Natural Resources
Soil Conservation Division
Geological & Natural Hist. Survey Commiss.
Legislative Council
Public Utilities Commission

Local - Private - Civic

Hockanum R. Clean-Up Committee
Conn. League of Sportsmen's Clubs
Hartford County League of Sportsmen's Clubs
Middlesex County League of Sportsmen's Clubs
New London County League of Sportsmen's Clubs
Conn. Forest and Park Ass'n
Conn. Soil Conservation Districts
Izaak Walton League of America
Conn. Horticultural Society
Conn. Farm Bureau Ass'n
Conn. State Chamber of Commerce
Natural Resources Council of Conn.
Wildlife Management Institute
White Memorial Foundation
Manufacturers Ass'n of Connecticut
Conn. Water Works Ass'n
Conn. Petroleum Council
School of Forestry-Yale University
Conn. Yankee Atomic Plant
Waterford-East Lyme Shell Fish Commiss

Prepared by the COMMITTEE on INSTITUTIONAL RELATIONSHIPS of the Clean Water Task Force. Last revised: 2/25/66

Findings and Conclusions

We have found the following major needs which appear to require some institutional changes.

1. Need for centralization of responsibility and formal coordination of State agencies concerned with water pollution abatement(and other aspects of water resources), with delegation of activities to appropriate agencies.

   The Water Resources Commission and the State Health Department are the two principal State agencies with pollution abatement responsibilities, plus a number of others as indicated in the Glossary. Although the Committee was advised that the pollution control powers now provided by State law are adequate to do the job required, it is believed that it is both necessary and important to pinpoint responsibility in one agency and to provide for coordination of all related programs in order to assure a continuing and effective enforcement program.

   Centralized responsibility and formal coordination do not necessarily require the creation of one super water agency. Action programs could still be carried on by a number of related agencies, and at a number of different levels of government in the State (such as by local health officers, for example), as long as these activities were based on one set of pollution control policies and were properly coordinated.

   One State authority over all clean water programs will make it easier for the Governor and the Legislature to fix responsibility and is essential for resolving conflicts. This is not possible with the present fragmented authority. Water is too critical for informal coordination.

2. Need for <u>enforcement</u> of pollution abatement programs at the <u>interstate</u> level.

   The New England Interstate Water Pollution Control Commission has done a commendable job in establishing water quality standards for the major rivers in New England. They have no power to enforce them, however.

   Connecticut has a particular stake in the effectiveness of the pollution abatement programs of upstream states. In general, Connecticut programs are further advanced but clean water on interstate rivers cannot be guaranteed without some interstate enforcement.

   The Water Quality Act of 1965 provides for the establishment and enforcement of water quality standards by the Secretary of Health, Education and Welfare on interstate rivers if the states fail to set and enforce such standards themselves.

   A rough comparison of the water pollution control programs of the New England states is shown on the following page.

COMPARATIVE WATER POLLUTION CONTROL PROGRAMS
New England States

STATUS OF MUNICIPAL SEWAGE TREATMENT
(New England Compact Area)

1964	SEWERED	RECEIVING TREATMENT		UNDER CONSTRUCTION		PLANS APPROVED		ENGINEERING REPORTS APPROVED		NO TREATMENT PROGRAM	
	POPULATION	POPULATION	%	POPULATION	%	POPULATION	%	POPULATION	%	POPULATION	%
CONNECTICUT	1,570,000	1,506,000	95.8	10,000	0.6	48,000	3.1	1,500	0.2	4,500	0.3
MAINE	527,000	100,000	19.0	22,000	4.2	16,000	3.0	373,000	70.8	16,000	3.0
MASSACHUSETTS	3,710,000	2,184,000	58.9	1,137,000	30.7	82,000	2.2	294,000	7.9	13,000	0.3
NEW HAMPSHIRE	327,000	135,000	41.3	26,000	7.9	3,000	0.9	105,000	32.1	58,000	17.8
NEW YORK (in compact area)	60,000	43,000	71.7	7,000	11.7	4,000	6.7	5,000	8.3	1,000	1.6
RHODE ISLAND	601,000	600,000	99.8	——	—	——	—	——	—	1,000	0.2
VERMONT	183,000	118,500	64.7	8,000	4.4	22,000	12.0	25,000	13.7	9,500	5.2
COMPACT AREA	6,978,000	4,686,500	67.2	1,210,000	17.3	175,000	2.5	803,500	11.5	103,000	1.5

Federally-Aided Sewerage Projects

SUMMARY

State	*Number of Projects*	*Projects Completed*	*Projects Under Construction*	*Estimated Cost of Projects*	*Federal Grants*
Connecticut	39	20	11	$29,987,282	$6,756,421
Maine	29	13	12	13,734,948	5,025,714
Massachusetts	113	65	35	52,459,745	15,515,348
New Hampshire	39	20	13	18,816,810	6,170,630
New York (in Compact area)	9	4	5	1,993,925	751,376
Rhode Island	34	16	12	18,809,182	8,031,054
Vermont	29	17	8	18,330,544	5,907,906
Total	292	155	96	$154,132,436	$48,158,449

From Seventeenth Annual Report (1964) - New England Interstate Water Pollution Control Commission.

3. Need for long-range planning at both State and interstate levels.

A. Comprehensive Planning - relating water resource planning to planning for other resources and urban development. Since an expanding population is continually increasing the need for water, particularly for water supply and recreation, it is essential that the protection of this resource, and its allocation, be coordinated with urban development. No such comprehensive planning is being undertaken at the New England level at the present time, but two different public agencies have been proposed for this function.

One is the New England Interstate Planning Commission which would be created by interstate compact. The compact has been approved by the legislatures of New Hampshire and Rhode Island and is presently before the Massachusetts Legislature. It was considered but not acted upon by the 1965 General Assembly of Connecticut. Such a commission would be made up of representatives appointed by the governors of the six New England states.

The other is the New England Regional Action Planning Commission which was authorized by the Public Works and Economic Development Act of 1965 and which would be composed of both Federal and State representatives.

At the State level, the Connecticut Interregional Planning Program is preparing a comprehensive plan for Connecticut. However, some State agencies concerned with water resources, such as the State Health Department and the Public Utilities Commission, are not included in the program.

B. Water Resource Planning - of all aspects of water resources. As a limited resource, uses for which there is continually greater competition, water requires careful and detailed planning. Coordination of both public and private activities and the weighing of alternatives is essential.

Except on some river basins, such as the Farmington and the Connecticut, there has been very little long-range planning of interstate waters in New England. There has been no coordination of water resource planning for all of New England.

The New England Interstate Water Pollution Control Commission has not conducted such studies but would be capable of long-range planning responsibilities if its functions were broadened to include other aspects of water resources.

The Water Resources Planning Act of 1965 provides for the establishment of a new body. The New England Regional River Basin Commission, which would be composed of Federal and state representatives and which would have water resource planning as its major function.

> At the State level, there is no long-range water resource planning, although the Water Resources Commission has inventoried Connecticut's water resources and detailed ground water surveys are still in process. However, there has been no attempt to measure total future needs and to allocate water for various uses or among major urban areas or between public and private companies. The diversity of public and private agencies responsible not only for water pollution abatement but for all other aspects of water resources has made such planning extremely difficult, but this diversity makes planning even more essential.

Special Note: The conclusions the Committee has come to with respect to items 1. and 3. above are supported by an article on Water Resources Problems by the Connecticut Legislative Council which was printed in their Eleventh Biennial Report, April 1965. Excerpts of this article are appended hereto.

4. Need for continuing <u>research</u> and <u>study</u> in water distribution, use and pollution control.

   Again, because of the multiplicity of agencies responsible for Connecticut's water resources, there has been no coordinated research and study program. U Conn's new Institute of Water Resources and other public and private organizations are capable of conducting such research provided that it be made meaningful through direction and coordination by one agency at the State level.

5. Need for citizen participation and voter control in water resource management in New England and Connecticut.

   The Committee on Institutional Relationships does not view the Federal Government as a foreign power and does recognize the need and value of many of the new Federal programs relating to water resources. The Committee also recognizes that in many instances the Federal Government has acted because the states have failed to do so. <u>The Committee believes that governmental responsibility should be maintained at the lowest level at which it can be exercised effectively and practically, thus allowing for the greatest public participation.</u>

   With respect to enforcement of water quality standards through the Water Quality Act of 1965, Connecticut should take advantage of the provisions of the act which permit the State to set its own (and perhaps higher) standards by filing a letter of intent by October 1, 1966 with the Secretary of Health, Education and Welfare and by establishing the standards by June 30, 1967. Centralization of responsibility in one State agency should improve Connecticut's ability to coordinate its program with the Federal Government's while maintaining a degree of local determination.

For interstate pollution abatement programs, the Committee would prefer to see the New England Interstate Water Pollution Control Commission given enforcement powers, but recognizes that Federal enforcement may provide the only practical approach.

The Committee would also prefer to see interstate water resource planning exercised by the NEIWPCC, which is made up only of State representatives, than by the New England Regional River Basin Commission which would also have Federal members. For the same reason, a New England Interstate Planning Commission, created by compact, is preferred for comprehensive planning responsibilities over the New England Regional Action Planning Commission.

The best way to prevent a complete abdication of responsibilities to the Federal Government is to reorganize interstate, state and local governments in order to improve their efficiency and strengthen their ability to deal with today's problems.

Recommendations

Changes in institutional relationships are recommended to improve the performance of the following functions related to water pollution abatement and other aspects of water resource management:

1. Comprehensive Planning - Coordinating water resource planning with planning for other resources and urban development.

   Interstate - Establish a New England regional planning commission. (An interstate compact is preferred to Federal-state body)

   State - Add State Health Department, PUC and perhaps other agencies to Connecticut Interregional Planning Program and coordinate water resource planning with other parts of Statewide planning program.

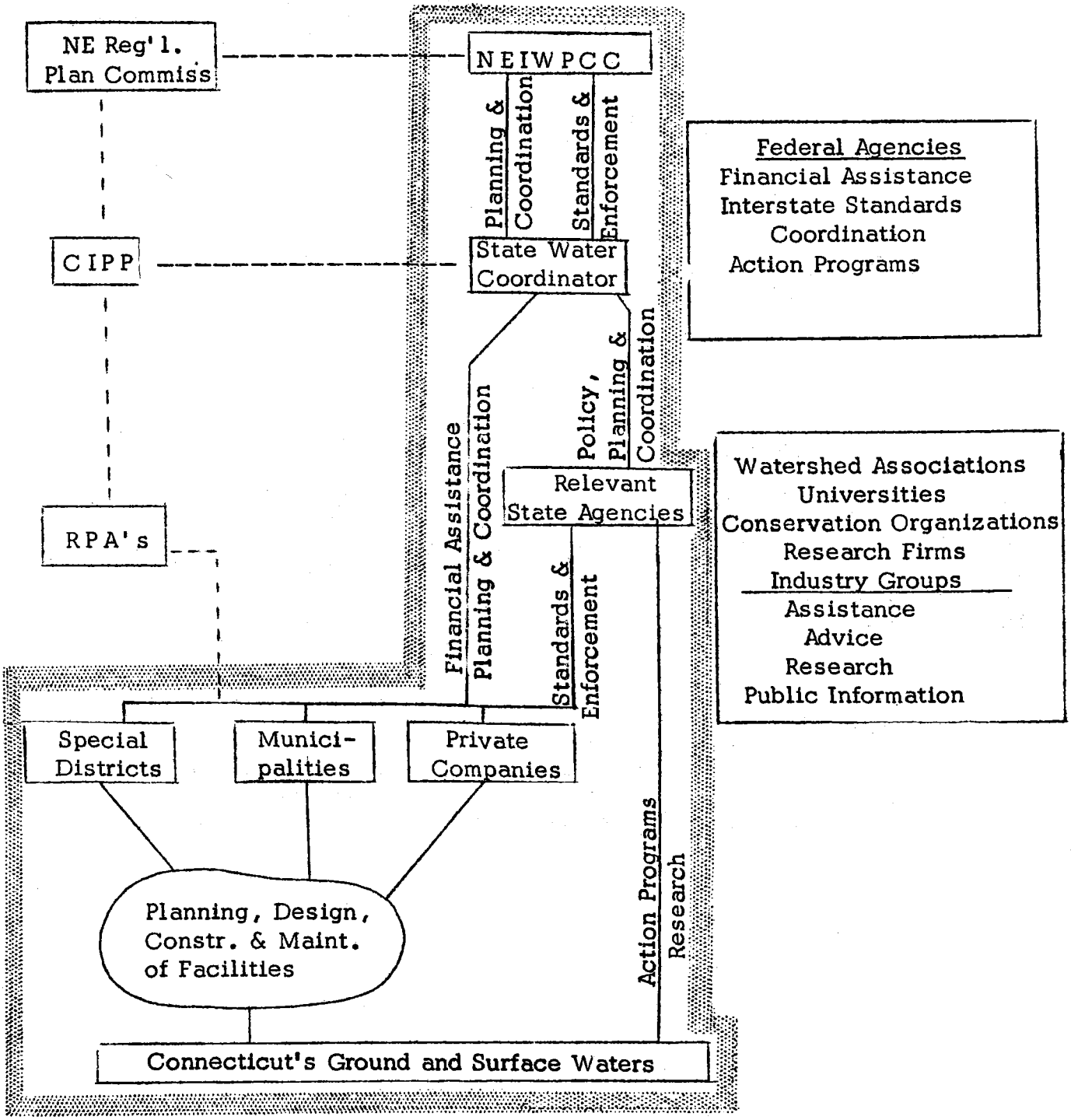
   Regional - Encourage coordination of water resource planning with other elements of work of regional planning agencies.

   Local - Emphasize water planning as important part of local plans of development.

   Private - Continue attention to comprehensive watershed planning by associations. Bring in educational and research organizations, public and private, on water resource research.

Preliminary Outline

SUGGESTED INSTITUTIONAL RELATIONSHIPS
for Clean Water in Connecticut
(and for other water resource purposes)



Abbreviations: CIPP - Connecticut Interregional Planning Program
NEIWPCC - New England Interstate Water Pollution Control Commission
RPA's - Regional Planning Agencies

5. Provide Financial Assistance - To supplement Federal Grants. (A suggestion for consideration by the Committee on Finance of the CWTF)

State - Establish grant program for both planning and construction of facilities to public and private bodies, with bonus for regional approach; also for research.

Local - Continue tax abatement for private pollution control facilities.

Appended:

League of Women Voter's Report
Excerpts from Legislative Council Report

Members of Committee on Institutional Relationships

Mrs. John G. Lee, Chairman
Robert D. Brown, Vice Chairman
Mrs. Hugh Gallaher, Secretary
Alvin L. Bean
Mrs. Taber deForest
Charles Duevel
John Ellsworth
Dr. Glen Hilst
Irwin Kaplan
Mrs. Daniel M. McKeon
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Resource People
William Wise, Director, Water Resources Commission
Richard N. Symonds, Planner, Conn. Interregional Planning Program
James S. Klar, Assistant Director, Development Commission
Carl N. Otte, Open Spaces Coordinator, Agriculture & Natural Resources

League of Women Voters of Connecticut,
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Price 25¢

February 1966

MAJOR STATE AGENCIES DEALING WITH CONNECTICUT'S LAND AND WATER USE

INTRODUCTION

This material has been prepared to give local League committees an overall view of the structure and functions of state agencies concerned with use of Connecticut's land and water. Since there are approximately 151 agencies in the executive branch, we have omitted those whose connections with land and/or water use appear to be slight. We have not included all the functions of all the agencies, but have summarized those which appear to be most important to our study.

We have included summaries of the functions of local Conservation Commissions, local health officers and local planning and zoning boards because of their importance to our study and because we felt the information about state agencies was incomplete without an understanding of these local functions. For a similar reason, we have included brief explanations of Open Space Funds, Connecticut Interregional Planning Program and Regional Planning Agencies. We expect to include more detailed information about these in later mailing which will be primarily concerned with programs dealing with land and water use. Frequently an agency, or a division, is set up to handle a new program or coordinate agencies or programs and an explanation of the program is needed to understand the function of the agency. With the exception of an explanation of the Regional Planning Program we have not included material about regional agencies at this time.

In regard to structure, there generally are policy making bodies of the agency who select the executive head. Thus there is usually a chairman of the commission as well as the executive head of a department. We have listed only executive heads. The agencies that were grouped together in 1959 to form the Department of Agriculture and Natural Resources retained their former structure and boards and the policy of the Commissioner and Council has been to allow them to operate as virtually autonomous agencies.

This material can be used as a tool to help you understand the relationship of state agencies and programs to your local program of land and water use. Information about Federal Programs will be found in Current Review of Water Resources No. 1 and No. 2 published by the League of Women Voters of the United States.

A summary of INTERSTATE AGENCIES is included at the end of this material.

MAJOR STATE AGENCIES DEALING WITH CONNECTICUT'S LAND & WATER USE

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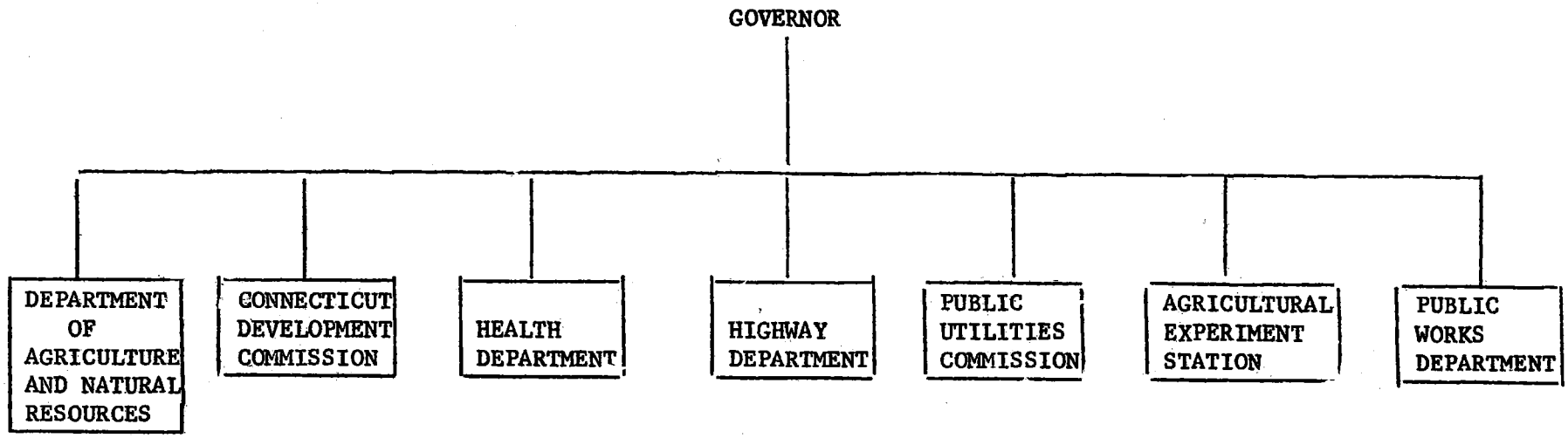
CHART

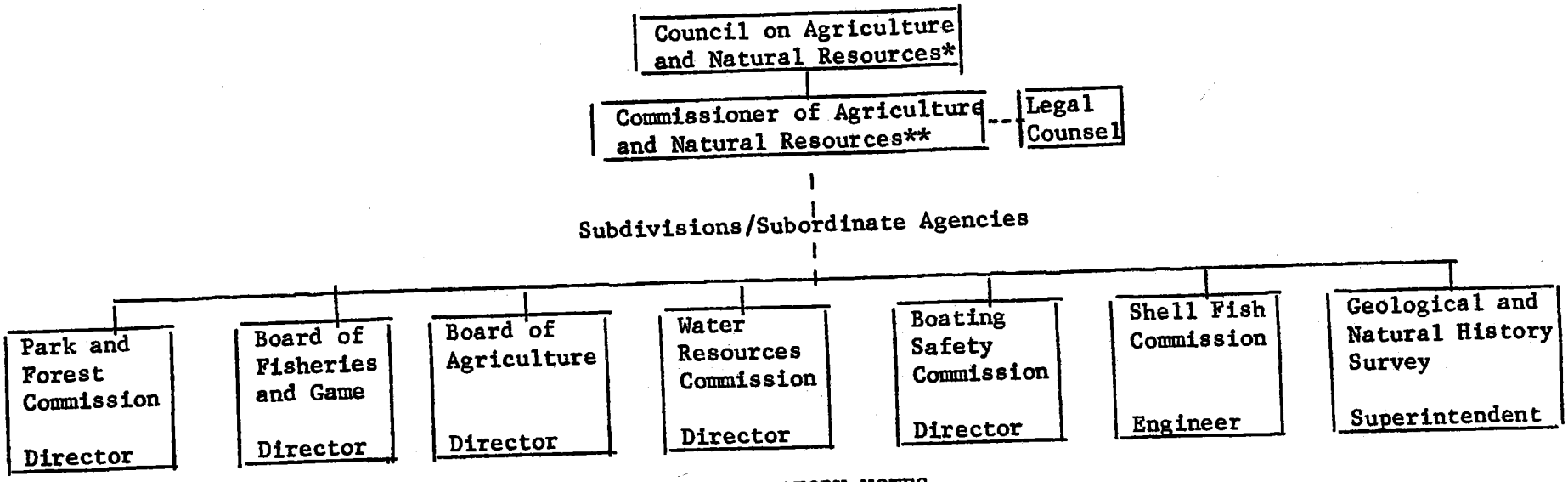
MAJOR STATE AGENCIES DEALING WITH CONNECTICUT'S LAND & WATER USE



Refer to Connecticut Public Expenditure Council charts in "The Structure of Connecticut's State Government" for more details on structure of these agencies.

Administrative Organization

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES



EXPLANATORY NOTES

DEFINITION OF DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES. General Supervision by Council and Commissioner. Section 22-1 b of the 1961 Supplement to the General Statutes states: "The council and commissioner shall exercise general supervision over the operation of the state board of agriculture, state park and forest commission, the water resources commission, the state board of fisheries and game, the shellfish commission, the Connecticut marketing authority and the state geological and natural history survey. Said commissions, boards, authority and function shall be a part of the department of agriculture and natural resources..." In addition, section 15-121 of the 1961 supplement states that "there shall be within the department of agriculture and natural resources a boating safety commission..."

*COUNCIL ON AGRICULTURE AND NATURAL RESOURCES. Under Section 22-1 b of the 1961 Supplement to the General Statutes, the council is empowered to "meet for consideration of the policies, programs and activities of the department and its subdivisions...(and to) be responsible for the formulation of policies for the administration of the department and for the coordination of the activities of its subdivisions." In addition the statute provides: if "a matter pending before any subordinate board or commission of the department raises a question of policy touching the jurisdiction of any other such board or commission...further action on such matter...shall be taken with the approval of the council..." Its members are the chairmen of the state board of agriculture, the state park and forest commission, the water resources commission, the state board of fisheries and game, the Connecticut development commission, and the commissioner (who is without vote).

Administrative Organization Chart of Department of Agriculture and Natural Resources (cont'd)

**COMMISSIONER OF AGRICULTURE AND NATURAL RESOURCES. Section 4-5 of the 1961 Supplement to the General Statutes establishes the Commissioner as a "department head" which, in turn, gives him the authority of Section 4-8 to "organize his department...for the efficient conduct of (its) business...," to appoint such "...employees as may be necessary for the discharge of his duties," and "...to make regulations for the conduct of his department..." In addition, Section 22-1 b recognizes the Commissioner as the "executive head" of the department for the purposes of chapter 50 of the General Statutes which covers purchasing and budget formulation and execution.

Source:
Department of Agriculture and Natural Resources

Major State Agencies Dealing with Connecticut's Land & Water Use (cont'd)

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

Structure: Established 1959. Joseph N. Gill, Commissioner, who is appointed by the Governor with advice and consent of either house for four years. The department operates under General Statutes 1958 Rev. Sec. 4-6. See also Sec. 22-1 b (c) 1963 Supplements.

The reorganization of the Department of Agriculture and Natural Resources on October 1, 1959 brought together most of the natural resources agencies in the state with the main purpose of coordinating efforts in the area of conservation. In order to effectuate this desired coordination, a Council of Agriculture and Natural Resources was established as the administrative head of the Department in conjunction with the Commissioner of Agriculture and Natural Resources who is also Chief Executive of the agency. The Council and the Commissioner exercise general supervision of the department and together they are responsible for policy formulation.

Function: The policy of the Council and the Commissioner has been one of non-interference in the day-to-day operations of the component divisions. Only when conflict arises between agencies does the Council assume jurisdiction and in the case of long-range planning and projects which cross agency lines. The Council is composed of the chairmen of the Commissions of the following divisions: State Park and Forest Commission, State Water Resources Commission, State Board of Agriculture, Connecticut Development Commission, and State Board of Fisheries and Game with the Commissioner of Agriculture and Natural Resources an ex-officio member. The chairman is appointed annually from among the members.

Open Space Funds

Responsibility for the administration of Chapter 97, Sections 7-131a through 7-131m of the 1963 Revision of the General Statutes providing for grants-in-aid to municipalities, rests with the Commissioner of Agriculture and Natural Resources as the administrative officer of the Council on Agriculture and Natural Resources. At present, the Open Space Program of the Housing and Home Finance Agency, now under the Dept.of Housing and Urban Development, which provides for open space grants directly to the towns from the Federal government, is in operation and H.R. 3846, establishing the Land and Water Conservation Fund, known as B.O.R. for Bureau of Outdoor Recreation, which administers it, provides additional funds.

This fund will make available over $1,000,000 per year to the state of Connecticut and its municipalities for planning and development as well as acquisition of outdoor recreation and open space lands. The Governor designated the Commissioner of the Department of Agriculture and Natural Resources as the agent responsible for receiving and disbursing these funds and for the preparation of a Comprehensive Statewide Outdoor Recreation Plan. Vollmer Associates, Engineers and Landscape Architects were employed to prepare this plan which was recently completed, and is designed to meet the requirements of the Secretary of the Interior for assistance under the Land and Water Conservation Fund.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture and Natural Resources (cont'd)

BOARD OF AGRICULTURE

Structure: 6 members appointed by the Governor for 6 year overlapping terms, with 3 ex-officio members; Commissioner of Agriculture and Natural Resources; Dean of Agriculture, University of Connecticut; Director, Connecticut Agriculture Experiment Station. Operates under General Statutes 1958 Rev., Sec. 22-2. See Sec. 22-1 b (c) 1963 Suppl. Joseph N. Gill, Executive Head of Division of Agriculture.

Function: The Division of Agriculture has the responsibility for maintaining healthy herds and flocks, promoting soil conservation and agriculture in general, enforcing seed regulations, disseminating price and supply information for fruits, vegetables and poultry, insuring pesticide control. The functions of this division which are most directly concerned with our study are:

Soil and Water Conservation Division: Joseph A. Ward, Jr.,Chief. This division coordinates the Soil and Water Conservation Program of the state, controls soil erosion, and assures proper use of the land, water, and forest resources. It administers the small watershed protection and flood control program and aids local conservation commissions and natural resource groups.

Soil and Water Conservation Districts have been established throughout the state on a county basis to carry out a program of assistance to individuals and groups in controlling soil erosion and in the proper use of the land, water and forest resources. The Soil Conservation Advisory Committee is the policy making group for the district program. Each district's program is administered by 5 supervisors elected by the landowners of that district for 3 year overlapping terms. The U.S. Department of Agriculture provides the necessary technical assistance through trained agricultural engineers, soil crop men, and farm planners. The Soil and Water Conservation Division coordinates the work of the various agencies and assists them administratively and financially in carrying out their work. Establishment of the eight districts and the Soil Conservation Advisory Committee enables the state to participate in the Small Watershed Program in conjunction with the federal government.

Community Conservation Commissions. A town conservation commission is the agency of local government concerned directly with natural resources development and use. The act enabling municipalities to establish conservation commissions was passed in 1961. (Chapter 97 Section 7-13a, 1961 Suppl.; An Act Enabling Municipalities to Establish Conservation Commissions.) A commission consists of from three to seven members appointed by the chief executive officer of the municipality, to serve for terms designated by the legislative body establishing the commission. A commission develops Open Space Programs for the purpose of having them incorporated by the planning commission into the comprehensive plans of development for the town; works actively on problems of pollution, flood, erosion and wet land preservation; studies federal and state laws as they pertain to conservation so that the full benefit of conservation programs at the various levels of government may be utilized. A commission may be designated as the town's agent to apply for state and federal Open Space Funds. The Department of Agriculture and Natural Resources Soil and Water Conservation Division works closely with all commissions and has been assisting in the formation and guidance of commissions.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture and Natural Resources, cont'd)

Pesticide Control Division: Brainerd Peck, Consultant. This division has the responsibility for registering pesticides and controlling their sale and application.

STATE PARK AND FOREST COMMISSION

Structure: Established 1921. Donald C. Mathews, Director, appointed by the Commission which consists of 6 members, appointed by the Governor with advice and consent of Senate, for 6 year overlapping terms. Operates under General Statutes 1958 Rev., 23-1, See Sec. 22-1 b (c) 1963 Suppl.

Function: The Park and Forest Commission has authority to acquire, maintain and make available open spaces for recreation; to develop recreational or picnic areas for public use in state parks and forests; to make rules and regulations for the maintenance of order, safety, and sanitation upon land it controls; and to supervise or administer such other duties as are related to parks and forests.

State Park Management - The operation, maintenance, and minor development of state parks is carried on in 80 state parks and 8 historical monuments with a total acreage of 24,113 acres.

State Forest Management - This division is primarily concerned with the management of 27 state forests totaling 123,884 acres.

Forest Fire Control - This division is primarily concerned with the prevention and suppression of forest fires in the 1,900,000 acres of forest land in the state.

The Department also has a Forest Nursery Operation which provides seedlings and young trees and shrubs at cost for various conservation projects and Forestry Assistance of Landowners which assists private landowners in establishing more productive management practices. Private landowners control 90% of Connecticut's woodlands.

BOARD OF FISHERIES AND GAME

Structure: Theodore B. Bampton, Director, appointed by the Board which consists of 5 members appointed by the Governor for 5 year overlapping terms. Operates under General Statutes 1958 Rev., 26-2. See Sec. 22-1b (c) 1963 Suppl.

Function: The Board of Fisheries and Game is responsible for enforcing the laws and regulations related to wildlife, fish and game. The Board acquires by gift, lease, purchase or agreement lands or waters suitable for fishing, hunting and trapping, or such rights and privileges on land and water in private ownership. Approximately 3/4 of operating revenue is derived from license fees from sportsmen, commercial fishermen, bait dealers, trappers, game breeders, private shooting preserves, commercial fish hatcheries, taxidermists, dog training areas and field trials.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture & Natural Resources, cont'd)

Game Management Division - Arroll L. Lamson, Chief. This program is designed to make Connecticut farmlands, woodlands, and wet lands more productive of wildlife.

Fish Division - Cole W. Wilde, Chief. Inland Fish Management Division is concerned with providing adequate recreational fishing through the restoration of fish habitat, stocking, manipulation of fish populations, and intensively managing available water. Marine Fisheries Program is concerned with the recreational and commercial fishing resources in Long Island Sound.

Land Acquisition Division - George C. Hancock, Chief. This division has charge of all matters connected with the acquisition of fishing and hunting areas and is engaged in a land and water acquisition program designed to bring properties of particular importance into state ownership for public use.

SHELLFISH COMMISSION

Structure: Established 1881. Ernest J. Bontya, Engineer, appointed by the Commission which consists of 5 members appointed by the Governor, with advice and consent of Senate, for 4 year overlapping terms. Operates under General Statutes 1958 Rev. 26-187. See Sec. 22-1 b(c) 1963 Suppl.

Function: This Commission has jurisdiction over all off-shore oyster grounds and underwater lands voluntarily placed under Shell Fish Commission control by various towns. The Commission functions primarily as a service to the public and industry in the administration of approximately 47,000 acres of franchised, leased and public grounds. The Commissioners supervise all activities and establish policy relating to the leasing of grounds, approval of transfers, collection of rentals and taxes, issuing of licenses, designation of spawning areas, reviewing permits for dredging or construction within tidal waters, appointing mud dumping inspectors and directing a volunteer unit of 32 shell fish policemen for the enforcement of shell fish laws.

STATE GEOLOGICAL AND NATURAL HISTORY SURVEY COMMISSION

Structure: Dr. Joe Webb Peoples, Director, appointed by the Commission which consists of 5 Commissioners, one each appointed by Presidents of colleges and universities for an indefinite term, with the Governor as ex-officio member. Operates under General Statutes, 1958 Rev., Sec. 24-1. See Sec. 22-1 b(c) 1963 Suppl.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture and Natural Resources, cont'd)

Function: The primary objectives of the division are to examine the geological formation and the animal and plant life of the state with special reference to their economic and educational value. It also prepares maps and reports to illustrate the state's geology and natural history. For several years the major activity has been the mapping of the surficial and bedrock geology of the state on a quadrangle basis in cooperation with the U. S. Geological Survey with state and federal government sharing the cost equally.

BOATING SAFETY COMMISSION

Structure: Bernard W. Chalecki, Director, appointed by Commission which consists of 5 Commissioners appointed by the Governor for 3 year overlapping terms. Operates under General Statues 15-122. 1963 Suppl.

Function: The Commission is charged with administration of the state's overall boating program. It is authorized under the General Statutes to "Cooperate with the Department of Health and the Water Resources Commission and investigate matters relating thereto and recommend means of improving boating sanitation."

WATER RESOURCES COMMISSION

Structure: William S. Wise, Director, appointed by the Commission which consists of 7 members appointed by the Governor, with advice and consent of Senate for 4 year overlapping terms. Operates under 1958 Rev. General Statutes 25-1. See Sec. 22 - 1 b(c) 1963 supplement. One member is a representative of State Department of Health. One each of other members represents the interests of agriculture, fish, wildlife and recreation, manufacturing, electric or water utilities; municipalities; and the general public. It was established in 1957 to replace 3 former state agencies: the State Water Commission, the Flood Control & Water Policy Commission, and the State Board of Supervision for Dams, Dikes and Reservoirs, and made part of the Department of Agriculture and Natural Resources in 1959.

Function: The State Water Resources Commission has the authority to control industrial and municipal sources of water pollution in Connecticut. It issues permits concerning various kinds of water use. It makes inventories of the quality and quantity of surface and ground waters and is responsible for the establishment of channel encroachment lines along rivers and streams.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture and Natural Resources, cont'd)

Water Pollution Control Program

Pollution Control Studies and collection of data are made under this program. These include: Industrial Waste Research, stream sampling programs and inventory of industrial wastes. Field investigations are made. The administration and enforcement of statutes includes: negotiations with municipal and industrial officials for the installation of sewage and industrial waste treatment facilities, the holding of public hearings, issuance of orders, review and approval of engineering reports and construction plans and specifications for all waste treatment facilities, issuance of permits regulating new sources of pollution and regulating refuse dumps near watercourses. Administration of Federal Grants for pollution control programs and construction grants for municipal sewage treatment works under Public Law 660 is handled under this division.

Flood Control Program

Flood control studies are made, negotiations and agreements with towns for reimbursement of cost, preparation of construction plans and supervision of construction are made in conjunction with the Public Works Department. Negotiations are made with Army Engineers and local officials during planning and design phases and assurance is provided to meet federal requirements on Federal-Local River protection projects and the Federal Reservoir Construction Program. Under the program for establishment of stream channel encroachment lines, surveys, hydraulic and hydrologic studies are made and public hearings are held before preparation of final maps and final order. Stream Channel encroachment lines are lines to which the water level rises when streams are flooded. Permit applications for placement of encroachments riverward from encroachment lines are processed, and prosecution of violations are made.

Hydraulic review is made of design of state highway bridges. Coordination is made with Army Engineers flood plain information studies.

Permits are processed for construction of tidal and hurricane protection projects.

Development of Waterways and Harbors

Permits are issued for structures in navigable waters and dredging in tidal waters after review of data and testimony.

Shore Erosion Control Program

After preliminary studies and development of program and allocation of funds, the general supervision of design and construction is under the Public Works Department.

Supervision of Dams Program

An inventory is made of all existing dams, applications for construction and alteration of structures are processed, construction permits and certificates of approval are issued.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Agriculture and Natural Resources, cont'd)

Inventory of Water Resources Program

Cooperative programs are being carried on with U.S. Geological Survey on surface water, ground water, quality of water and mapping of topographic, surficial and bed-rock, also special studies on ground and surface waters. Ten year program is now in fifth year of operation.

Registration of Well Drillers Program

Certificates are issued and fees collected. Individual well drilling reports are reviewed and compiled.

Sale of Water by Public Water Supply Systems Program

Public hearings are held, testimony and technical data is reviewed and permits issued.

BOARD OF PESTICIDE CONTROL

Structure: 3 members of the Board appointed by the Governor for 3 year overlapping terms and 8 ex-officio members: Commissioner of Agriculture and Natural Resources; Commissioner of Health; Director, Connecticut Agricultural Experiment Station; Chairman, State Board of Fisheries and Game; Chairman, State Park and Forest Commission; Chairman, State Water Resources Commission; Chairman, Shellfish Commission; Highway Commissioner. Operates under General Statutes 19-300g 1963 suppl. Brainerd T. Peck, Agriculture Pesticide Control Consultant.

Function: The purpose of the Board is to administer the statutes as prescribed by law and designed to protect the public health and safety and the natural environment in the custom application of pesticides. The Board also conducts a continuing study of the pesticide problems with the objective of utilizing safer but effective materials. The activities include withholding from registration certain hazardous pesticides, publishing information on proper pesticide use, inspecting and approving areas for aerial spraying or dusting, conducting analytical laboratory tests, and determining qualifications of aerial applicators. The Board cooperates with other state agencies in these functions.

Board of Pesticide Control is designated by statute (Sec. 19-300r) to hear appeal by anyone aggrieved by the decision of the Commissioner of Agriculture and Natural Resources regarding the sale or use of pesticides. The Commissioner may not vote or participate in the hearing as a board member but must present his reasons for his ruling.

Major State Agencies Dealing with Connecticut's Land & Water Use (cont'd)

STATE DEPARTMENT OF HEALTH

Structure: Dr. Franklin Foote, Commissioner, appointed by the Governor with advice and consent of the Senate. The Public Health Council consists of the Commissioner and 9 members, appointed by the Governor who serve without compensation for 6 year overlapping terms. Operates under General Statutes 1958 Revision Sec. 4-6. See also Sec. 19-1 1963 suppl.

Function: The State Department of Health administers health laws and the sanitary code. Pertinent to our study it has powers to investigate and enforce laws on any condition relating to pollution of waters of the state by sewage. The sanitary code is established by the Public Health Council.

Sanitary Engineering Division - David Wiggins, Director. This division is responsible for: 1. The supervision of public water and ice supplies. 2. Chlorination of filtration and flouridation plants. 3. Investigation of complaints. 4. Collection of water samples for analysis. 5. Inspection of municipal and institutional sewage plants. 6. It approves plans for new plants and rebuilding of old plants in this field. 7. Studies hazards from radiological industrial operations, and air pollution hazards from radiation. 8. The mosquito control program is headquartered in Madison and carries on an active program of control of salt marsh mosquitoes in 15 towns along the shore. 9. The Air Pollution Control Section is undertaking an intensive survey to make recommendations by 1967 for specific air pollution abatement requirements. New local control programs are planned with the assistance of the federal Clean Air Act. The Department is assisting local health departments in organizing these new programs and furnishing technical assistance where needed.

Laboratory Division - Among other laboratory examinations, 91,437 were made for official agencies concerned with sanitary quality of public water supplies, other potable waters, bathing waters and streams, with the quality and safety of milk, milk products, and frozen desserts, with problems of sewage disposal, and with industrial toxicology, with air pollution and with environmental radiation.

Local Directors of Health - The Commissioner of Public Health has authority over local directors of health. He shall "assist and advise" them, but also "may require the enforcement of any law, regulation or ordinance relating to public health .... and may for cause and with the consent of the council remove any such director." (Sec. 19-1). Actual policy is to allow local health departments to operate without interference by State Department of Health. A local director of health is appointed locally after approval by the Public Health Council. The local appointive power rests with the Board of Health, where one exists, or the Board of Selectmen unless a special act applies. A local director of health is described in the Connecticut State Statutes as "some discreet person, learned in medical and sanitary science." If the population of a town is 40,000 or more, he must also hold a degree in public health (or some combination of training and experience) and devote full time to this job. The statutes grant him "all powers necessary for preserving the public health and preventing the spread

of diseases" within the limits of his city, town or borough. He has jurisdiction over all matters creating nuisances within his region. This includes any nuisance created by improper or inadequate sewage disposal, particularly as it applies to individual systems, refuse removal, and mosquito breeding places. With respect to streams, his jurisdiction is over a stream or body of water (with islands) contiguous to the town but not wholly within the town's limits. He shall enforce or assist in the enforcement of the sanitary code. By ordinance, a town may adopt sanitary rules and regulations, but only if consistent with the sanitary code. The enforcement authority is vested in the courts.

CONNECTICUT DEVELOPMENT COMMISSION

Structure: Established 1939. LeRoy Jones, Managing Director, appointed by the Commission with approval of the Governor. 12 Commissioners appointed by the Governor for 5 year overlapping terms. Operates under General Statutes 32-1. Revision to 1962.

Function: The objectives are to study and investigate conditions affecting Connecticut's industry, business, commerce, agriculture, and recreational and residential facilities, and promote and encourage the preservation, expansion and development of these facilities; to promote and encourage the location and development of new industry, business, commerce, agriculture, recreational and residential facilities in the state; to collect, compile and disseminate information relative to the natural and economic resources of the state; to cooperate with promotional and research groups and associations, with agencies of the state and its political subdivisions, and with agencies of the federal government and other states in the execution of its duties.

Community Development Division - Milo Wilcox, Jr., Chief. This division is concerned with initiation and organization of community planning, urban renewal and industrial development, regional planning, community development activities in local and (as appropriate) regional levels, technical advice to local planning and zoning commissions, zoning boards of appeals, urban renewal agencies, industrial development commissions, regional planning agencies; administration of federal and state planning and urban renewal financial assistance programs for local agencies; review of open space application in conjunction with the Department of Agriculture and Natural Resources.

Regional Planning Program - The Connecticut Development Commission is given authority to establish planning regions under Sec. 32-7 of the General Statutes. A Regional Planning Agency is an agency formed by legislative action of the individual towns and cities within a planning region. It is created by member towns to formulate a plan of development for the region. Regional planning agencies operate under enabling legislation as set forth in Chapter 127, General Statutes.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Connecticut Development Commission, cont'd)

A Regional Planning Agency is not a new form of government. It has no taxing, police or eminent domain powers. It is answerable to the voters through their appointed representatives to the agency and relies on town appropriations for its basic income, but state and federal governments also contribute a share of the agency's budget.

The chief purpose of a regional planning agency is to formulate a regional plan of development. As in local planning, a hearing must be held before plans may be adopted. Plans and policies are adopted by vote of the municipal representatives of the member towns who have created the agency.

A Regional Planning Agency has no authority to enforce its recommendations for a regional plan of development. It indicates consensus for action and shows how people in a community want their region to develop. It is a framework for reference for towns and cities in deciding where to locate schools, where to extend the water and sewer lines, how to zone the municipal area, where to locate parks, and for agencies of the state government who decide where to locate express highways, bridges, airports, parks and service facilities.

Local Planning and Zoning Commissions. The General Statutes provide for regulation of land use by Planning and/or Zoning Commissions established by local governments. Commissions (or other local government body empowered to act as a Commission for Zoning purposes) are virtually autonomous. Their actions may be questioned in the courts by an interested party. Chapters 124 and 126 of the General Statutes describe the procedure to be used in establishing Planning and Zoning Commissions. Included are directions concerning the election or appointment of members, terms of office, number of members, officers, minutes, etc. Towns may establish Planning Commissions without having a Zoning Commission, or a Zoning Commission with no Planning Commission, separate Commissions, or joint Commissions with functions and membership varying accordingly. In cities or boroughs, unless a special act applies, the Council or Board of Alderman, or whatever the body having authority to pass ordinances is called, acts as a Zoning Commission. Whenever a Zoning Commission is established, a Zoning Board of Appeals must be created at the same time.

Planning Commissions have three important areas of responsibility. First, they must "prepare, adopt" (after public hearing) "and amend a plan of development for the Town." (all quotes from General Statutes). Secondly, a Planning Commission adopts, amends, and administers regulations concerning the subdivision of land in a community, (after public hearing), in some towns only after vote of legislative body. (Subdivision, as defined in the General Statutes, means the division of a tract of land into three or more parts of lots.) The third responsibility of the Planning Commissions is the requirement, by law, that they must review any proposal for "Municipal improvement" and issue a report, expressing approval or disapproval.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Connecticut Development Commission, cont'd)

Zoning Commissions are required to establish districts within a Town and to regulate, uniformly within a district, the following: Uses to which the land and buildings may be put, whether for farming and residences, commerce, industry or other; the height and size of buildings; the density of population and the percentage of the area of lots to be occupied; the location and size and height of advertising signs and billboards. Zoning regulations may also provide that certain uses of land or kinds of buildings will be permitted in a Town only after a special permit or exception is obtained from a specified Town Board (usually Zoning Board of Appeals) This regulation must describe the standards and conditions to be met before such permits may be granted.

In towns with separate Planning and Zoning Commissions, proposed changes in zoning regulations must be submitted to the Planning Commission 30 days before the public hearing. If a disapproving report is received in return this must be read at the Hearing.

Changes in zoning regulations or in zone boundaries may be requested by anyone; the Commission must hold a public hearing and then adopt or deny the change. The Commission need not consider requests for substantially the same changes within one year's time. Zoning officials may bring legal action, in Circuit Court, against anyone found to be violating zoning regulations. Fines, within certain limits, are prescribed.

Zoning Boards of Appeals

The powers of Zoning Boards of Appeals are to -

1. Grant a variance from existing zoning regulations
2. Grant a special exception when provision for such is stated in the regulations and
3. To interpret the zoning regulations through appeals made from a decision of a municipal officer or department, such as building inspector.

The Zoning Board of Appeals is required by law to make decisions within 60 days after the mandatory public hearing and to publish these decisions. Appeals from Zoning Board of Appeals decisions may be made to Court of Common Pleas.

Administrative Division

Connecticut Interregional Planning Program, a joint program of the Connecticut Development Commission, Connecticut Department of Agriculture and Natural Resources and Connecticut State Highway Department. The CIPP is a unique interagency effort which includes the development of a land use, resources and transportation. It consists of a Board of Administration, Horace H. Brown, Chairman, with one representative from each of the three agencies which operate under the Interagency Policy Committee made up of Commissioner of Highway Department, Commissioner Department of Agriculture and Natural Resources and the Managing Director of the Connecticut Development Commission. The Board of Administration was set up by agreement of the three agencies and financially aided through a federal grant authorized by Section 701 of the Housing Act of 1954.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Connecticut Development Commission, cont'd)

Since the primary purpose of the Interregional Program is to provide a generalized state-wide framework of development policy for the regions as well as for the state, the various regional planning agencies located within the state are closely associated with all aspects of the entire program. The regional planning directors serve as advisors to the Interregional Planning Staff and regularly provide the necessary regional data.

The CIPP is a comprehensive state-wide physical and economic planning program comprising inventory, planning and implementation phases. In the inventory phase now completed, the various natural, cultural, economic, demographic, and government factors influencing the growth and development of Connecticut have been identified and presented in 16 Technical Reports. The accumulation of actual data and the preliminary analysis of the inventory phase are the basis of and were a necessary prelude to the planning phase. During the planning phase, which should be completed in 1966, objectives for the state and its regions will be identified. An analysis and synthesis of the past trends derived during the inventory phase will be undertaken. The data will be developed into forecasts which, in turn, will be translated into a generalized state-wide plan of development. This should form the basis for a continuing planning program in the socio-economic, development distribution, transportation and open space-recreation fields.

CONNECTICUT HIGHWAY DEPARTMENT

Structure: Established 1895. Howard S. Ives, Commissioner, appointed by the Governor for four years with advice and consent of either house of the General Assembly. Operates under General Statutes 1958 Rev. Sec. 4-6. Average number of full time employees 5,100.

Function: This department is responsible for the construction, maintenance and repair of highways and bridges, and the operation of toll facilities, ferries, bridges and parkways.

Highway Administrative Director: A. Earl Wood. Responsible to him are several departments which have an indirect influence on land and water use including Division of Research and Development, Bureau of Rights-of-Way, Bureau of Fiscal Services, Personnel Division, Training Division.

Office of Chief Engineer: Robert Mitchell, Chief Engineer; Israel Resnikoff, Chief of Planning. This department is responsible for administering all phases of engineering from the initial planning and design through construction and maintenance of all state highways.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Connecticut Highway Department, cont'd)

Steps in highway planning (according to Department Officials)

1. Consult with all state officials who have an interest in the region the highway is to go through. (Commissioner of Natural Resources, Board of Fish & Game, Park & Forest Commission, etc.). This happens at least 5 years before any construction is contemplated.
2. Consult local officials in the communities involved. (Mayor, town manager, planning commission, selectmen, etc.)
3. Plot general route based on all considerations. (Engineering, money, safety, impact on communities, etc.)
4. Public hearing held in each community. Recommended route is explained. Public has chance to make suggestions.
5. A second public hearing is held if open-space land is affected. Concurrence is required by town governing body. If town approval is not granted, Highway Commissioner may appeal to Superior Court.
6. Route is pinned down. Actual highway is designed. Surveys are made. Public may still suggest. This is reasonably complete about 2 years before construction.
7. Lands acquired in excess of needs of roadway, if bordering state park, are offered to State Park and Forest Commission; if abutting streams suitable for fishing, are offered to State Board of Fisheries & Game.
8. If no alternative to taking open-space land is possible, minimum area is taken and special landscape treatment is developed to enhance the aesthetic appearance of the site.

CONNECTICUT AGRICULTURAL EXPERIMENT STATION
New Haven, Conn.

Structure: Established 1875, James G. Horsfall, Director, appointed by Board of Control which consists of 5 members, 2 appointed by the Governor, 1 each by Wesleyan and University of Connecticut, 1 by Sheffield Scientific School Board for 3 year overlapping terms, and 3 ex-officio members: Governor, Commissioner of Agriculture and Natural Resources and the Director. Operates under General Statutes 22-79, 1958 Revision.

Function: The guiding purpose of the Station is to put science to work for agriculture by doing research throughout the field of plant science.

Research in Plant Science Division - This is the heart of the station's over-all program. Included in this division are studies of insects and their control; the nature and control of plant diseases; plant chemistry; improvement and utilization of forests; and inheritance and improving breeds of plants.

Some of the present projects demanding attention of the staff are: research on water and its use and loss by plants, treatment to protect plants from frost damage, quality research on fruit, and basic research of the gypsy moth.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Connecticut Agricultural Experiment Station, cont'd)

Analytical Testing and Regulators Services - The principal elements of this program are the analysis of soils, feeds, fertilizers, drugs, cosmetics and pesticides. This division cooperates with law enforcement officials, other state agencies and the public on many problems requiring its analytical services. Analysis of pesticides on sale and of pesticide residues in food are new responsibilities.

COLLEGE OF AGRICULTURE, UNIVERSITY OF CONNECTICUT

Storrs, Conn.

W. B. Young, Dean and Director

The Storrs Agricultural Experiment Station has on its staff scientists who conduct research in many areas related to people and natural resources such as fish and wildlife management, animal and poultry science, forestry, soils and crops and agricultural economics.

The Cooperative Agricultural Extension Service through a state staff of specialists and county extension agents, makes available the results of research and other information.

PUBLIC UTILITIES COMMISSION

Structure: 3 members appointed by the Governor for 6 year overlapping terms with advice and consent of either house. Operates under General Statutes Sec. 16-2; 1965 Suppl. Chairman is Eugene S. Loughlin who is appointed by the Commission.

Function: The Commission, as an administrative and quasi-judicial body, is delegated to perform certain legislative functions and prescribed duties pertaining to the regulation of water companies, especially the problems of utilization of water resources and coordination and integration of water supply systems.

DEPARTMENT OF PUBLIC WORKS

Structure: Timothy J. Murphy, Jr., Commissioner, appointed by the Governor with advice and consent of either house. The Citizens Council on Public Works is an advisory council with 6 members appointed by the Governor for 6 year overlapping terms. The Citizens Commission on Housing is an advisory commission consisting of 5 members appointed by the Governor for 6 year overlapping terms. Operates under General Statutes 1958 Rev. Sec. 4-6. The Council on Public Works operates under Sec. 4-127 and the Commission on Housing operates under Sec. 8-123, both 1958 Revision.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Department of Public Works, cont'd)

Function: The Department is responsible for the administrative functions of planning and construction of all capital improvements undertaken by the state except highways and bridges.

WEATHER CONTROL BOARD

Structure: Members are: Chairman, Commissioner of Agriculture and Natural Resources, Chairman of Water Resources Commission, the Dean of the College of Agriculture of the University of Connecticut, the Director of Connecticut Agricultural Experiment Station and a meteorologist qualified for professional membership in the American Meteorological Society and who shall be appointed by the Governor for a 6 year term. The Board shall meet on the call of the Chairman. Operates under Chapter 463, Sec. 24-5, 1963 Suppl.

Function: (1959 PA 668, S.2) According to statute the Board may conduct research and development activities relating to: 1) the theory and development of methods of weather modification and control.... 2) the utilization of weather modification and control for agricultural, industrial, commercial and other purposes, and 3) the protection of life and property during research and operational activities. The Board may receive funds on behalf of the state for stated purposes.

LEGISLATIVE COUNCIL

Structure: Established 1937. 24 members, 18 elected by the General Assembly and 6 ex-officio, for 2 year terms. The Council is a bipartisan body composed of the President Pro Tem of the Senate, the Speaker of the House of Representatives, the majority and minority leaders of both Houses, ex-officio, and three Senators and six Representatives from each major political party, who are elected. The Council appoints the executive head, George W. Oberst, Director.

Function: By law, the Council is required to make or cause to be made studies and investigations of all propositions submitted to it by the General Assembly and the Governor. In addition, the Council may, on its own initiative, undertake studies of matters pertaining to important issues of public policy and questions of state-wide interest. The objective of the Council is to present factual information upon the subjects referred to it for study and such recommendations for action or non-action as the Council deems desirable.

Pertinent to our study are the report on Water Resources Problems on page 99 of the Eleventh Biennial Report, Legislative Council, State of Connecticut, April 15, 1965 and the report on private water companies on page 94 of the same report.

(Major State Agencies Dealing with Connecticut's Land & Water Use, Cont'd)

INTERSTATE COMMISSIONS

COMMISSION ON INTERGOVERNMENTAL COOPERATION

Structure: Established in 1937 under Chapt. 19, Gen. Stat. The Commission is composed of 18 members: 3 ex-officio - the Governor, Lieutenant Governor, and the Speaker of the House; 5 administrative members, 5 senators and 5 representatives. George W. Oberst, Administrator,

Function: To do all such acts as will, in the opinion of said Commission, enable this state to do its part among the various governments in the United States. To endeavor to advance cooperation between this state and other units of government by formulating proposals for and by facilitating (a) the adoption of compacts, (b) the enactment of uniform or reciprocal statutes, (c) the adoption of uniform or reciprocal administrative rules and regulations, (d) the informal cooperation of governmental offices with one another, (e) the interchange and clearance of research and information, and (f) any other suitable procedures.

Intergovernmental Commissions are administered through this office.

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

Structure: Organized 1947 under Sec. 25-67 of the General Stat. ('63 Rev.) Consists of 5 members from each signatory state; Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and New York. In Connecticut this includes Commissioner of Health and Director of Water Resources Commission, both ex-officio, and 3 others appointed by the Governor for 3 year overlapping terms, to represent municipal, industrial, and fishing or conservation interests.

Function: To coordinate the work of the member states in the control of pollution of interstate water; to establish water quality standards and approve classifications for such waters. Enforcement powers are retained by the states.

NORTHEASTERN INTERSTATE FOREST FIRE PROTECTION COMMISSION

Structure: 3 representatives from each of the 6 New England states plus New York form the Commission. Other states may join if contiguous to member states. Operates under Gen. Stat. 23-53.

Purpose: To promote effective prevention and control of forest fires in the northeastern region of U. S. and adjacent areas of Canada by (1) integrated forest fire plans, (2) maintenance of adequate forest fire fighting services by member states, (3) providing mutual aid in fighting forest fires, (4) establishment of central coordinating committee to carry out provisions.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Interstate Commissions, cont'd)

INTERSTATE SANITATION COMMISSION

Structure: Established 1941 by a tri-state compact - Connecticut, New York, New Jersey. Each state has five members. In Connecticut, Attorney General, Commissioner of Health, and Director of State Water Resources Commission are ex-officio. The Governor appoints 2 other members for four-year terms. Operates under Gen. Stat. 25-66. (The statutes give power to the commission, subject to approval by the Congress of the United States, to study smoke and air pollution.)

Function: The abatement of existing pollution and the control of future pollution of the tidal waters in the New York - New Jersey - Connecticut Metropolitan area. It has legal power to take court action in pollution cases where the proper state department has been notified of the situation but has failed to obtain compliance with regulations.

CONNECTICUT RIVER VALLEY FLOOD CONTROL COMMISSION

Structure: Compact adopted in 1951 Statutory authority Sec. 25-53 of General Statutes. Three commissioners each from Massachusetts, Connecticut, New Hampshire and Vermont.

(The Flood Control Act of 1936 gave Federal Government right to control floods and build dams on navigable waters.)

Function: To promote interstate cooperation for adequate storage capacity, for protection from floods, and for water resources utilization in the Connecticut River and its tributaries. Makes provisions for financing projects through a reimbursing schedule by downstream states to upstream, where flood control dams and reservoirs result in loss of revenue.

THAMES RIVER VALLEY FLOOD CONTROL COMMISSION

Structure: Compact adopted in 1957. Statutory authority Sec. 25-101 of the General Statutes. 3 commissioners appointed by Governor for 6 year overlapping terms from Connecticut, and 3 from Massachusetts.

Function: Similar to that of Connecticut River Valley Flood Control Compact Commission described above.

ATLANTIC STATES MARINE FISHERIES

Structure: Established 1946. Statutory authority Sec. 26-295 Gen. Stat. Three members from each of the 15 Atlantic Coastal states. In Connecticut, the chairman of the State Board of Fisheries and Game and two other members appointed by the Governor.

Function: Coordination of the efforts of the 15 Atlantic Coastal States to conserve their marine fisheries.

Major State Agencies Dealing with Connecticut's Land & Water Use
(Interstate Commissions, cont'd)

NORTHEASTERN RESOURCES COMMISSION

Structure: 1 member from each state to be appointed by law of each state (in Connecticut by the Governor) and 7 members representing departments or agencies of federal government having principal responsibility for water and related land resources development to be appointed subject to U.S. Law. The Statutory authority is 25-120, 1963.

Function: To provide for coordination of policies, program and activities in the field of water and related land resources and provide means by which conflicts may be resolved. Although the Northeastern Resources Commission compact did not receive full approval of the Congress, the basic purposes of the compact have been incorporated within PL 89-80. Therefore this commission may be used as the nucleus of the New England Regional River Basin Commission.

NEW ENGLAND REGIONAL RIVER BASIN COMMISSION

Structure: The New England Regional River Basin Commission has been requested by the governors of the states involved, and approved by the Water Resources Council under PL 89-80, the Water Resources Planning Act of 1965. The final act in the establishment of this commission, which will be the announcement by the President, is expected in early 1966. The Commission would be composed of one representative of each of the six New England states and New York; the following Federal Agencies: Department of Agriculture, Department of the Army, Department of Commerce, Department of Health, Education and Welfare, Department of the Interior, Federal Power Commission, Department of Housing and Urban Development; and the following interstate resource agencies: New England Water Interstate Pollution Control Commission, Connecticut River Valley Flood Control Commission, Merrimack River Flood Control Commission, Thames River Valley Flood Control Commission and the International Joint Commission (United States - Canada.)

Function: The jurisdiction of the proposed New England Regional River Basin Commission would include the area of the six New England states together with that portion of the State of New York within the drainage areas of the Housatonic River and Lake Champlain and excluding those portions of the State of Vermont and Commonwealth of Massachusetts within the drainage area of the Hudson River.

The Commission will be responsible for coordination of Federal, State, Local and nongovernmental plans for the development of water and related land resources. It will also be responsible for preparing and keeping up-to-date a comprehensive, integrated joint plan for the basin. It will also recommend long-range schedules of priorities for the collection and analysis of basic data and for the investigation, planning and construction of projects.

Major State Agencies Dealing with Connecticut's Land & Water Use (cont'd)

TRI-STATE TRANSPORTATION COMMISSION

Structure: An Inter-State compact created by State Legislation in Connecticut, New Jersey and New York -- to continue the functions of the Tri-State Transportation Committee. Operates under General Statutes 16-339; 341 - 1958 Rev.

The Commission consists of 18 representatives -- 15 from the three member states, equally apportioned -- and three representatives of the Federal government, one from the Bureau of Public Roads, one from the Housing and Home Finance Agency now under the Department of Housing and Urban Development, and one from the Federal Aviation Agency.

The 5 Connecticut representatives shall include the Highway Commissioner or his designate, the Chairman of the Connecticut Development Commission or his designate, the Chairman of the Public Utilities Commission, the Chairman of the Connecticut Transportation Authority, and a designate of the Governor to serve as his personal representative.

The "compact region" is the Metropolitan New York area and includes 12 counties in New York, 10 in New Jersey and the 6 planning regions of Western Connecticut, as defined by the Connecticut Development Commission.

Function: The Commission shall conduct surveys, make studies, submit recommendations and plans to facilitate solution of transportation problems, (including mass transportation, highways, railroads, airports, and marine transportation). The Commission may consider all land use problems related to development of proper transportation planning. The Commission shall act as a liaison to encourage coordination among and between all government and private entities involved with the planning and provision of transportation and other related public facilities.

The Commission may act as an official planning agency of the party states for the "compact region".

Major State Agencies Dealing with Connecticut's Land & Water Use (Cont'd)

REFERENCES

1. State of Connecticut, Budget Report of Governor John Dempsey 1965-1967

2. Structure of Connecticut's State Government by Connecticut Public Expenditures Council - December 1963.

3. State of Connecticut Register and Manual, 1964 and 1965.

4. Digest of Connecticut Administrative Reports to the Governor, 1963-64 and 1964-65.

5. Directory of Agencies concerned with Connecticut's Natural Resources compiled by George Whitham, County Agent leader, Cooperative Extension Service, University of Connecticut, College of Agriculture.

6. How to Get Clean Water in the Connecticut Valley, Connecticut River Watershed Council, Greenfield, Mass.

7. Interviews with State officials.

8. List of Responsibilities and Activities of Water Resources Commission prepared for Clean Water Task Force.

9. Planning Connecticut's Regional Communities, Connecticut Development Commission.

10. Eleventh Biennial Report, Legislative Council, State of Connecticut, April 15, 1965.

11. Connecticut Takes Stock for Action, Connecticut Interregional Planning Program, Connecticut Development Commission, June 1964.

12. Water Resources Planning Legislation, Thomas J. Rouner, Chairman Northeastern Resources Committee Subcommittee on Water Resources Planning Legislation.

Excerpts From
Water Resources Problems
ELEVENTH BIENNIAL REPORT
Connecticut Legislative Council
April 15, 1965

Management

Inextricably related to use is the management of water resources. This is primarily a governmental responsibility by which water policies and programs are conceived, coordinated, controlled and applied. At present, the state's management is so fragmented that it is not even a confederated activity.

Some attempt at centralization was made in 1957, when the General Assembly created the Water Resources Commission to replace the State Water Commission, State Flood Control and Water Policy Commission and State Board for the Supervision of Dams, Dikes, Reservoirs and Other Similar Structures. However laudable, the attempt was wholly inadequate; water responsibilities are hopelessly divided. At least nine state agencies are involved, directly or indirectly, in various aspects of water management: Water Resources Commission, State Health Department, Shell Fish Commission, Department of Agriculture--Soil Conservation District, State Board of Fisheries and Game, State Park and Forest Commission, Boating Safety Commission, Public Utilities Commission and Connecticut Development Commission.

In addition, the state participates in inter-state water management through four agencies: New England Interstate Water Pollution Control Commission, Interstate Sanitation Commission, Connecticut River Flood Control Commission and Thames River Flood Control Commission.

To further complicate matters, at least ten federal agencies have management jurisdiction: U.S. Army Corps of Engineers, U.S. Geological Survey, New England-New York Inter-Agency Committee, Northeastern Resources Committee, U.S. Fish and Wildlife Service, U.S. Department of Agriculture--Soil Conservation Service, Housing and Home Finance Agency, U.S. Public Health Service, Department of Health, Education and Welfare and U.S. Coast Guard.

Typical of the confusion which results from such diffusion was a recent incident when oil leaking from a passing tanker collected on a shore-line beach. Investigators from half-a-dozen state and federal agencies appeared, each to check a different aspect of the problem. No agency was fully responsible for correction, and no agency could take any corrective action without the consent of others.

Furthermore, many water management laws are curative rather than preventive, and they leave untouched many areas in which centralized control is, or will be, badly needed. The Water Resources Commission, for instance, never knows officially when, where and in what quantities substantial new consumers draw upon water supplies or old consumers increase their uses. Even if it had the knowledge, it has no power to intervene, though the uses create acute shortages. At every session, the General Assembly consents to the creation of new water companies;

except for health purposes, no one is advised respecting the source, present or future adequacy or effect of the new use upon the water supplies which will be tapped. Pollution is probably the most serious water problem in the state today, yet responsibility for water sanitation and pollution control is divided between the Water Resources Commission and State Health Department, with the Boating Safety Commission operating in a limited advisory capacity.

The management problem is not peculiar to Connecticut. So many states are involved in similar divided responsibilities that the Council of State Governments found it necessary last year to draft a model water management law. It would seem that Connecticut could benefit from the unpleasant experiences of other states.

Planning

At present, no agency has a direct responsibility for water planning. To the extent that any planning effort exists, it is an individual, uncoordinated activity undertaken by a state agency in aid of other problems and responsibilities. Sound planning years ago may have avoided or mitigated the flood damage of 1955. Sound planning today certainly can anticipate and avoid the problems of twenty-five and fifty years hence. It may be possible to be satisfied with existing water policies for a few more years, still the need of water planning exists, whether administration is centralized or not. It is an essential part of the economic and social planning upon which the state so heavily depends for its future health and growth.

Despite the obvious need, virtually nothing has been done to prepare for water planning . The 1955 General Assembly commissioned an ad hoc study by the Water Resources Study Commission for that purpose, but its report, cited above, contained little in the way of positive recommendations. Technical Reports Nos. 124 and 150 of the Development Commission, also cited above, are excellent lay surveys of water facilities and deficiencies, but they are not intended, and do not purport, to be critical commentaries. The University of Connecticut, with the help of a federal grant, has established an Institute on Water Resources--essentially a planning activity—but for all practical purposes it is a private endeavor, having no statutory existence and no direct relationship to any state agency concerned with water problems. The Council feels that because of fragmented management and divided responsibilities, no agency can assume to itself the task of water planning and none will do so until clearly required by the General Assembly.

Recommendations

To overcome these several deficiencies, the Council feels that the General Assembly should:

1. - - - - - - - -

2. - - - - - - - -

3. Integrate under a centralized administration all activities of all state agencies involved in water management and all agencies engaged in inter-state management activities; consolidate water management activities as much as possible, and enlarge authority for administrative supervision of large water consumers.

4. Establish a comprehensive water planning program integrated with other economic planning activities of the state and assign the responsibility as a mandate to a specific agency under specific instructions.

5. - - - - - - - -

Reproduced for Committee on Institutional Relationships,
CLEAN WATER TASK FORCE. February 1966.

COMMITTEE ON FEDERAL RELATIONS

COMMITTEE ON FEDERAL RELATIONS

The following Federal Acts offer assistance in the field of Water Pollution and Sewage Disposal:

1. Federal Water Pollution Control Act.
2. Water Quality Act of 1965.
3. Housing and Urban Development Act of 1965.
4. Water Resources Research Act of 1964.
5. Water Resources Planning Act.
6. Appalachian Regional Development Act of 1965.
7. Public Works and Economic Development Act of 1965.
8. Consolidated Farmers Home Administration Act Amendments - Rural Waters and Waste Disposal Systems.

Summaries of this legislation follows:

1. Water Pollution Control Act

Federal Statutory Basis: PL 84-660 Amended by PL 87-88 and PL 89-234

Purpose: To expand the State's water pollution control program. Federal funds provide for training of personnel, research and equipment required to carry out the program and also for construction of treatment facilities.

Federal Official Responsible: Secretary of the Interior.

Assistance Available:

Sec. 2 - A Federal Water Pollution Control Administration is established within the Department of Health, Education and Welfare.

Sec. 3 - The secretary of the Department of HEW is authorized, in cooperation with other Federal agencies, with state water pollution control agencies and interstate agencies, and with the municipalities and industries involved, to prepare or develop comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries thereof and improving the sanitary condition of surface and underground waters.

Sec. 4 - The Secretary shall encourage cooperative activities by the States for the prevention and control of water pollution.

Sec. 5 - The Secretary shall conduct in the Department of HEW and when practicable in cooperation with other appropriate agencies, research, investigations, experiments, demonstrations, and studies relating to the causes, control, and prevention of water pollution and publish information so derived. For the purposes of this section there is authorized to be appropriated not more than $5,000,000 for any fiscal year, and the total sum appropriated for such purposes shall not exceed $25,000,000.

Sec. 6 - The Secretary is authorized to make grants to any State, municipality or intermunicipal or interstate agency for the purpose of assisting in the development of any project which will demonstrate a new or improved method of controlling the discharge into any waters of untreated or inadequately treated sewage or other waste from sewers which carry storm water or both storm water and sewage or other wastes, and for the purpose of reports, plans, and specifications in connection therewith.

There is authorized to be appropriated for the purposes of this section for the fiscal year ending June 30, 1966, and for each of the next three succeeding fiscal years, the sum of $20,000,000 per fiscal year.

Federal grants under this section shall be subject to the following limitations:

(1) A project must be approved by the State Water Pollution Control Agency as well as by the Secretary.

(2) No grant shall exceed 50% of the project's reasonable cost.

(3) No grant shall exceed 5% of the total amount authorized by this section in any one fiscal year.

Sec. 7 - There is authorized to be appropriated for the fiscal year ending June 30, 1957, and for each succeeding fiscal year to and including the fiscal year ending June 30, 1961, $3,000,000 and for each succeeding fiscal year to and including the fiscal year ending June 30, 1968, $5,000,000 for grants to States and to interstate agencies to assist them in meeting the costs of establishing and maintaining adequate measures for the prevention and control of water pollution.

Under this section, allotments to the States shall be on the basis of: (1) population, (2) the extent of the water pollution problem, (3) the financial need of the respective States.

Sec. 8 - The Secretary is authorized to make grants to any State, municipality, or intermunicipal or interstate agency for the construction of necessary treatment works to prevent the discharge of untreated or inadequately treated sewage or other waste into any waters and for the purpose of reports, plans, and specifications in connection therewith.

There is authorized to be appropriated for the purposes of this section for each fiscal year through and including the fiscal year ending June 30, 1961, the sum of $50,000,000 and $80,000,000 for the fiscal year ending June 30, 1962, and $90,000,000 for the fiscal year ending June 30, 1963, and $100,000,000 for the fiscal

year ending June 30, 1964, and $100,000,000 for the fiscal year ending June 30, 1965 and $150,000,000 for each of the fiscal years 1966 and 1967.

A grant for a project shall not exceed $1,200,000 or 30% of the project, whichever is the smaller. If the project shall serve more than one municipality each municipality will be individually reimbursed pursuant to the above limitations until the maximum sum of $4,800,000 is reached.

However, if a project is certified as being in conformity with comprehensive planning for the metropolitan area, the Secretary may increase the amount of the grant by 10%.

Sec. 9 - A Water Pollution Control Advisory Board is established for the purpose of advising, consulting with, and making recommendations to the Secretary on matters of policy relating to the activities and functions of the Secretary under this Act.

NOTE: During the fiscal year 1964-65 Connecticut received $49,000 under this Act as the State's apportionment. During fiscal year 1965-66 Connecticut will receive $82,200.

2. Water Quality Act of 1965 - amends Federal Water Pollution Control Act. - see above.

3. Housing and Urban Development Act of 1965.

Federal Statutory Basis: Grants for Basic Water and Sewer Facilities - PL 89-117, Title 7, Sections 701 and 702. Approved August 10, 1965.

Purpose: To assist and encourage the communities of the Nation fully to meet the needs of their citizens by making it possible, with Federal grant assistance, for their governmental bodies to construct adequate basic water and sewer facilities needed to promote the efficient and orderly growth and development of our communities. Grants will be made to local public bodies and agencies to finance specific projects for basic public water facilities (including works for the storage, treatment, purification, and distribution of water), and for basic public sewer facilities (other than "treatment works" as defined in the Federal Water Pollution Control Act).

Federal Official Responsible: Mr. Robert Weaver, Secretary of the Department of Housing and Urban Development.

Assistance Available: There is authorized to be appropriated for each fiscal year commencing after June 30, 1965, and ending prior to July 1, 1969, not to exceed $200,000,000 for grants under Section 702. Any amounts appropriated shall remain available until expended, and any amounts authorized for any fiscal year under Section 708 but not appropriated may be appropriated for any succeeding fiscal year commencing prior to July 1, 1969.

Generally grants shall not exceed 50% of the development cost of the project, however, in the case of a community having a population of less than 10,000 experiencing severe unemployment and unable to finance the project under the 50% program, 90% of the development cost of the project will be paid by the Federal Government.

4. Water Resources Research Act of 1964.

Federal Statutory Basis: PL 88-379; Approved July 17, 1964.

Purpose: To assist in assuring the Nation of, at all times, a supply of water sufficient in quantity and quality to meet the requirements of its expanding population, this Act will stimulate, sponsor, provide for, and supplement present programs for the conduct of research, investigations, experiments and the training of scientists in the fields of water and of resources which affect water.

Federal Official Responsible: The Secretary of the Interior.

Assistance Available:

Title I - This Title will provide the State with $75,000 for the first fiscal year and $87,500 for the second and third years and $100,000 each year thereafter to assist in establishing and carrying on the work of a competent and qualified water resources research center at the University of Connecticut.

There is further authorized to be appropriated to the Secretary of the Interior for the fiscal year 1965 and each subsequent year thereafter sums not in excess of the following: 1965 - $1,000,000; 1966 - $2,000,000; 1967 - $3,000,000; 1968 - $4,000,000; and 1969 and each of the succeeding years, $5,000,000. Such monies when appropriated, shall be available to match, on a dollar-for-dollar basic, funds made available to centers by states, or other non-federal sources to meet the necessary expenses of specific water resources research projects which could otherwise not be undertaken, including the expenses of planning and coordinating regional water resources research projects by two or more centers.

Monies appropriated pursuant to this Act, in addition to being available for expenses for research, investigations, experiments, and training conducted under authority of this Act, shall also be available for printing and publishing the results thereof and for administrative planning and direction.

Title II - This Title appropriates to the Secretary of the Interior $1,000,000 in fiscal year 1965 and $1,000,000 in each of the nine fiscal years thereafter from which he may make grants, contracts, matching, or other arrangements with educational institutions (other than those establishing centers under Title I of this Act), private foundations or other institutions; with private firms and individuals; and with local, state and federal government agencies, to undertake research into any aspects of water problems related to the mission of the Department of the Interior, which may be deemed desirable and are not otherwise being studied.

5. Water Resources Planning Act

Federal Statutory Basis: PL 89-80. Approved July 22, 1965.

Purpose :

Title I - Establishes a Water Resources Council whose functions are to continually study and determine the adequacy of supplies of water necessary to meet the water requirements in each water resource region of the United States.

Title II - Authorizes the creation of River Basin Commissions when requested by the Council or a State. These Commissions, when created, will study and recommend ways to improve and develop the Nation's river basins.

Title III - In order to meet the rapidly expanding demands for water throughout the country this act seeks to encourage the conservation, development, and utilization of water and related land resources of the United States by providing financial assistance to the States for developing and participating in the development of comprehensive water and related land resources plans.

Assistance Available: For the next fiscal year beginning after the date of enactment of this Act, and for the nine succeeding fiscal years thereafter, $5,000,000 is authorized in each year for grants to States to assist them in developing and participating in the development of comprehensive water and related land resources plans and authorized under Title III.

Allotments to the States shall be made by the Council in accordance with its regulations, on the basis of (1) population, (2) land area, (3) the need for comprehensive planning and (4) the financial need of the respective states.

The Council for any fiscal year will not pay more than 50% of the cost of carrying out a state's program.

6. Appalachian Regional Development Act of 1965

Federal Statutory Basis: PL 89-4. Approved March 9, 1965.

Federal Official Responsible: This program is administered by the Secretary of the Army.

Purpose: To provide public works and economic development programs and the planning and coordination needed to assist in development of the Appalachian Region.

Title I - Establishes an Appalachian Regional Commission of one Federal member appointed by the President and one member from each participating State. The Commission has planning, study, promotional, coordinating, and advisory functions. The Commission's decisions require an affirmative vote of the Federal member, and a majority vote of the State members.

Assistance Available: This act authorizes Federal officers to undertake a survey on Appalachia Water Resources. This five million dollars is authorized for preparation of comprehensive water and related resources plans, which may recommend measures for flood control, regulation of rivers to enhance their value as source of water supply for industrial and municipal development, power, prevention of water pollution by mine drainage, recreation, navigation where economically justified, land resource conservation and utilization, etc. These plans will be made in consultation with the Secretary of Agriculture, Commerce, Health, Education and Welfare, Interior, the T.V.A. and the F.P.C. The plan shall be coordinated with other federal plans for river systems draining the region.

7. The Public Works and Economic Development Act

Federal Statutory Basis: PL 89-136. Approved August 26, 1965.

Purpose: An Act to provide grants for public works and development facilities, other financial assistance and the planning and coordination needed to alleviate conditions of substantial and persistent unemployment and underemployment in economically distressed areas and regions.

Provisions

Title I - Grants for Public Works & Development Facilities Authorizes the Secretary of Commerce to make direct grants up to 50 per cent of total project cost for needed public works in redevelopment areas, which will tend to improve industrial or commercial opportunities, otherwise assist in the creation of additional long-term employment opportunities, or primarily benefit the long-term unemployed and members of low income families, or otherwise substantially further the objectives of the Economic Opportunity Act of 1964 (Anti-Poverty Act). The project shall fulfill a pressing need, and the area shall have an approved

overall economic development program, with which the project shall be consistent.

Authorizes the Secretary to make supplementary grants, which with the direct grants, may not exceed 80 per cent of project cost, to enable redevelopment areas to take maximum advantage of designated Federal grant-in-aid programs, defined as existing or future Federal grant-in-aid programs assisting in facilities construction or equipment, designated by the Secretary; direct grant-in-aid; and certain Federal watershed projects for which they are eligible but for which they are economically unable to supply the required matching share.

Supplementary grants shall be made by the Secretary by increasing the amounts of direct grants or by the payment of funds appropriated under this Act to the heads of Federal agencies responsible for the administration of the applicable Federal programs.

Direct and supplementary grants may be made on application of any State, or political subdivision thereof, Indian tribe, or private or public nonprofit organization or association representing any redevelopment area or part thereof.

The severity and duration of unemployment, and the income levels of families and the extent of underemployment, shall be among the relevant factors to be considered by the Secretary in prescribing rules, regulations, and procedures to assure that adequate consideration is given to the relative needs of eligible areas.

Projects competing with an existing privately owned utility may be assisted only with specific Congressional authorization, unless the State or Federal regulatory body determines that there is need in the area which the existing utility cannot meet.

The Secretary shall prescribe regulations to assure opportunity for review and comment by appropriate local governmental authorities.

In addition to assistance otherwise authorized, grants may be made to areas which the Secretary of Labor determines were areas of substantial unemployment during the preceding calendar year. These areas shall be subject to annual review of eligibility and to all of the regulations, etc., applicable to redevelopment areas, except as the Secretary may otherwise prescribe. (Such areas eligible for grants but not loans).

Not more than 15 per cent of the funds appropriated may be expended in any one State. Assistance to projects approved for assistance under the Appalachian Regional Development Act of 1965 prohibited.

Annual appropriations of $500 million authorized for grants for fiscal years 1966 through 1969.

No financial assistance under the Act shall be made to be used directly or indirectly for sewer or other waste disposal facilities unless the Secretary of Health, Education, and Welfare certifies to the Secretary that any waste material carried by such facilities will be adequately treated before it is discharged into any public waterway so as to meet applicable Federal, State, interstate, or local water quality standards.

Title II - Other Financial Assistance

Provides for a program of loans for public works and development facilities, and a program of loans and guarantees for industrial and commercial facilities, and establishes an economic development revolving fund.

Public Works and Development Facility Loans

Eligibility criteria same as for grants (except grants only are authorized for areas of substantial unemployment not otherwise eligible). Maximum maturity 40 years. Interest rate variable, based on Federal borrowing cost less .5%. Other requirements: funds are not otherwise available; loan funds plus other available funds are adequate to complete project; there is reasonable expectation of repayment.

Loans and Guarantees

Long-term low-cost industrial and commercial loans, up to 65 per-cent, and guarantees of private loans for working capital in redevelopment areas, up to 90 per cent, authorized. Anti-pirating provisions applicable.

Annual appropriations of $170 million authorized for these purposes for fiscal years 1966 through 1970.

Title III - Technical Assistance, Research and Information

Technical assistance, which would be useful in alleviating or preventing excessive unemployment or underemployment, to redevelopment areas and other areas with substantial need for such assistance authorized, including project planning and feasibility studies, managment and operational assistance, and economic evaluation studies, through Federal agencies, outside contracts, and grants-in-aid to appropriate public or private nonprofit State, area, district, or local organizations. Repayment of assistance may be required at the Secretary's discretion. Grants to defray up to 75 per cent of administrative costs of organizations receiving grants-in-aid authorized, such grants to be used in conjunction with other planning grants where practicable. A continuing study, training and research program, to be carried on in cooperation with other agencies, on the causes of economic distress, and solutions to such problems, and assistance in providing personnel needed to conduct coorective programs authorized. Information and advice to redevelopment and other areas authorized. Independent study board on effects of Government procurement, scientific, technical, and other related policies on regional economic development established. Annual appropriations of $25 million authorized for these purposes for fiscal years 1966 through 1970.

Title IV - Area and District Eligibility

The Secretary, directed to designate as redevelopment areas those in which there has been substantial and persistent unemployment, and those in which there has been substantial population loss due to lack of employment opportunity, based on specified criteria; those with a median family income not more than 40 per cent of the national median; certain Indian reservations; on their request areas which have experienced or are threatened with an unusual

and abrupt unemployment rise due to loss of a major employment source; areas designated under the Area Redevelopment Act, until the first annual review of eligibility. A currently approved over-all economic development program required. Minimum population and area requirements stated. If a State has no qualified area, the area which most nearly qualifies shall be designated a redevelopment area. An annual review of designated areas is to determine their continued eligibility. Termination will not affect pending applications, contracts, or undertakings.

The Secretary authorized to designate economic development districts, with the concurrence of affected States, to permit economic development projects of broader geographical significance. Such districts must contain two or more redevelopment areas, and one or more redevelopment areas or economic development centers of sufficient size and potential to foster economic growth activities necessary to alleviate the distress of these areas, and have an approved district over-all economic development program.

The Secretary authorized to designate economic development centers, also to permit economic development projects of broader geographical significance, which must be identified and included in an approved district over-all economic development program and recommended for such designation by the affected State or States, must be so related to the district that its economic growth will alleviate distress in the areas of the district; and have a population not exceeding 250,000. Such centers, if not otherwise eligible, may receive grant and loan assistance for projects which will further the district economic development program and increase its economic growth potential and long-term employment opportunities.

Grants in redevelopment areas within economic development districts may be increased by amounts up to 10 per cent of project cost.

The Secretary authorized to foster State and local activity in connection with economic development districts.

Annual appropriations of $50 million for fiscal years 1967 through 1970 authorized for grants to centers and the 10 per cent increase, effective date to be delayed one year from enactment to permit adequate and careful district planning.

Title V - Regional Action Planning Commissions

The Secretary authorized,with the concurrence of the States concerned, to designate economic development regions if he finds a geographical, cultural, historical, and economic relationship among the areas, if the region is within contiguous States (except Alaska and Hawaii), and if, on consideration of certain stated matters, he finds that the region has lagged behind the Nation as a whole in economic development. The Secretary directed to invite and encourage States with regions to establish multistate regional commissions. Commissions shall be composed of a Federal cochairman and one member from each participating State, one of whom shall be elected a cochairman. The Commissions would have broad functions relating to long-range programs, studies for the preparation of specific development plans, promotion of increased

private investment, preparation of legislative and other recommendations, continuing development of comprehensive and coordinated plans and programs, investigations, research and studies, interstate compacts and other interstate cooperation, etc. Each Commission shall make a detailed annual report to the Congress.

Annual appropriations of $15 million authorized for these purposes for fiscal years 1966 through 1970.

Title VI - Administration

The Secretary of Commerce to administer the Act, and with the assistance of an additional Assistant Secretary, supervise and direct the Administrator for Economic Development and coordinate the Federal cochairmen. The Assistant Secretary to perform such functions as the Secretary may prescribe. He and the Administrator to be appointed by the President and confirmed by the Senate.

The Secretary is directed to appoint a National Public Advisory Committee on Regional Economic Development, and is authorized to confer with others, and to provide for consultation with interested departments and agencies.

Financial and technical assistance under the Act to be in addition to any previously auhtorized Federal Assistance. No provision to be construed as authorizing or permitting any reduction or diminution in the proportional amount of Federal assistance to which any State or other entity would otherwise be entitled under any other Act.

8. Consolidated Farmers Home Administration Act Amendments - Rural Water and Waste Disposal Systems.

Federal Statutory Basis: PL 89-240. Approved October 7, 1965.

Purpose: To amend the Consolidated Farmers Home Administration Act of 1961 to authorize the Secretary of Agriculture to make or insure loans to public and quasi-public agencies and corporations not operated for profit with respect to water supply, water systems, and waste disposal systems serving rural areas and make grants to aid in rural community development planning and in connection with the construction of such community facilities, to increase the annual aggregate of insured loans thereunder, and for other purposes.

Assistance Available: Amends the Consolidated Farmers Home Administration Act of 1961 to:

(1) Authorize the Secretary of Agriculture to make or insure loans to associations, including nonprofit corporations and public and quasi-public agencies, to provide for the installation or improvement of waste disposal facilities, primarily serving farmers, ranchers, farm tenants, farm laborers and other rural residents, and to furnish financial assistance and other aid in planning projects for the purpose. This is in addition to his existing authority to extend such assistance to such associations for these other purposes: Soil conservation,

shifts in land use, the conservation, development, use and control of water, the installation of improvement of drainage facilities, and recreational developments.

(2) Authorize the Secretary of Agriculture to make grants to such associations to finance specific projects, including facilities providing central service or those serving individual properties, or both, for works for the development, storage, treatment, purification or distribution of water or the collection, treatment or disposal of wastes in rural areas, which do not include any area in any city or town which has a population in excess of 5,500 inhabitants.

Grants may aggregate not to exceed $50 million in any fiscal year. No grant shall exceed 50 per cent of the project development cost, defined as the cost of construction of a facility and the land, easements and rights-of-way, and water rights necessary to its construction and operation.

A grant is contingent on determination by the Secretary that the facility: (1) will serve a rural area not likely to decline in population below that for which it is designed; (2) will be of adequate capacity to serve the present population of the area and its reasonably foreseeable growth needs; (3) is necessary for orderly community development consistent with a comprehensive rural area community water or sewer development plan; and not inconsistent with an approved official area plan. All applications for financial assistance under the Act must be submitted for review and comment to the county or municipal government. If a comprehensive area plan is in preparation, the Secretary may make grants prior to its completion until October 1, 1968.

(3) Replace the limitation on an association's total indebtedness--$500,000 in direct loans, $1 million in insured loans -- with a limitation of $4 million on the total amount of an association's indebtedness and grant assistance at any one time.

(4) Authorize the Secretary of Agriculture to make grants to public bodies or other agencies authorized to prepare official comprehensive plans for the development of water and sewer systems in rural areas lacking funds for the immediate undertaking of such plans. Grants may aggregate not to exceed $5 million in any fiscal year.

(5) Require that a unit of general local government will receive assistance, in the absence of substantial reasons to the contrary, if such a unit is one of two or more applicants for financial assistance for a project to serve the same area.

(6) Require, as a condition of Federal financial assistance, that the appropriate State water pollution control agency certify that a water supply system will not result in pollution of the waters of the State in excess of the standards established by the agency; that the effluent from sewers and waste disposal systems will conform with appropriate State and Federal water pollution control standards when and where established.

(7) Make liberalizing changes in the loan and loan insurance provisions of the Act.

Members of Committee on Federal Relations

Robert Willis, Chairman
Elisha C. Freedman, Vice Chairman
Rex Altomare
Paul Hayden
Richard S. Jackson
Howard Moreen
Mrs. Frances B. Rich
Stephen G. Rose
Mrs. Sidney Sweet, Jr.
J. Robert Tomlinson

Resource People

Merwin E. Hupfer, Principal Sanitary Engineer, Water Resources Commission
Raymond U. Rosa, Federal Project Coordinator, Finance and Control
Robert Barrus, Federal Aid Coordinator, Agriculture & Natural Resources
Charles Hammarlund, Field Coordinator, Economic Development Administration, U. S. Dept. of Commerce
LeRoy Jones, Managing Director, Development Commission
Carl N. Otte, Open Spaces Coordinator, Agriculture & Natural Resources

COMMITTEE ON ECONOMICS AND FINANCE

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For Municipal Treatment

1. That the State of Connecticut adopt a Program of Financial Aid and Incentive aimed at completing the necessary municipal treatment and collection facilities - statewide - over a seven-year period. It is anticipated that the State Legislature will consider this proposed program in 1967, and that the first full year of action resulting from any legislation would be 1968. The seven-year program would then be from 1968 to 1974 inclusive.

2. That the State assume 30% of the cost of such new interceptors and sewage treatment plans as are necessary to achieve the Clean Water goals for the State. And further, that the State prefinance the Federal Government's 30% share, to the extent that such action is necessary - so that the State's program may be completed over a seven-year period.

3. Municipalities - to be eligible for the combined State and Federal grants of 60% of the cost of these facilities - must have completed all necessary engineering planning, received approval of the appropriate State agencies and started construction not later than December 31, 1974, or by any other date specified by the State Water Resources Commission.

4. To encourage rapid action and to ease the burden of planning costs for municipalities before they provide for their overall financing of their projects - municipalities may apply to the State Water Resources Commission for an advance of up to 5% of the anticipated cost of the project. The advance to be non-interest bearing for two years - and to be deducted from the State's eventual 30% grant.

5. To fund the State's and any prefinanced Federal share, a Bond Issue of up to $150 million is recommended - with bonds to be sold on an as-needed basis.

6. That, in addition, sufficient funds be allocated in the State Budget to provide for adequate staffing of the Department of Health and the Water Resources Commission and for the employment of consulting firms - as it is deemed necessary to implement and control this overall program through 1973 - and beyond that to sustain a continuing effort toward maintaining clean water for the State.

For Industrial Treatment

7. That for corporate tax purposes the State provide for a one-year writeoff of construction costs provided that plans have been approved by the appropriate State agencies by December 31, 1972, and that construction has been started by December 31, 1973 - or other dates specified by the Water Resources Commission. Further, that this action be made retroactive as to construction costs back to May 1, 1966.

8. That appropriate action be taken to eliminate from State Sales or Use Tax materials or equipment purchased to construct or operate industrial treatment facilities.

And That Every Effort Be Made by the State of Connecticut to Influence the Federal Government to:

9. Increase its annual aid program to states from $150 million to $500 million.

10. That the additional funds be allocated on a population basis.

11. That all project ceilings be eliminated where the state matches the Federal share and that they pay a full 30% share.

12. That provisions be incorporated to facilitate State prepayment plans - with the Federal Grants going directly to State agencies to repay any prepaid portions of a municipal project.

13. That for corporate tax purposes a one-year write off be allowed for costs of constructing industrial treatment facilities - retroactive to 1966 - provided construction is completed by a specified deadline.

14. That Redevelopment Funds be made available to industries forced to move by the requirement to provide industrial waste treatment facilities.

Members of Committee on Economics and Finance

John S. Wyper, Chairman
Edwin Caldwell, Vice Chairman
Edward Bates, Secretary
Milton Berglund
David Coffin
Kenneth Jansen
John A. North
Graham R. Treadway
Mrs. Chase Going Woodhouse

Resource People

Joseph E. Swider, Deputy Commissioner, Agriculture & Natural Resources
John J. Curry, Chief Engineer, Water Resources Commission
John F. Tarrant, Director, Research Division, Tax Department
Leo Donahue, Deputy Commissioner, Finance and Control

COMMITTEE ON INFORMATION

COMMITTEE ON INFORMATION

The assignment of this committee is:

> "collect information from other committees, edit, collate, and distribute it through the many channels of reaching the general public."

To these ends we have begun work in the following categories:

Speakers' Bureau

We have reviewed films and filmstrips and have purchased or borrowed several of the best for the Task Force's use. One film was given us by WNHC-TV.

We have compiled a list of speakers and have filled all requests for speakers or information concerning the makeup of the Task Force.

News Releases

These will not begin until the final report has been presented to the Governor on May 20. Because of the difficulties of informing 100 Task Force members of committee deliberations, and in obtaining everyone's ideas, we have not released any piecemeal or interim reports or news. This policy was determined by the chairmen and co-chairmen of all other committees.

However, a news release was made to weekly newspapers identifying the local Task Force members and their committee assignments.

Distribution of Releases

These will be made to Connecticut weekly and daily newspapers, radio and TV stations, A.P. and U.P.I., and also the major New York City, Springfield and Providence news media on May 20. Alternate morning and afternoon release times will be used.

Report of the Task Force

The report will be issued in two forms - technical and popular.

The technical report will be ready May 20. This will consist of committee reports as submitted and the final recommendations of each committee. This report will also include a summary of all the committee reports written by Richard Martin. The technical report will be offset printed.

The popular report will be ready, we hope, in mid May. This will be a simplified, non technical, colorful presentation of the Task Force report. It will be printed on glossy paper and have color pictures of clean water in Connecticut.

The technical report will be mailed to the president or head of state-wide organizations and federations. The popular report will be sent to their many member clubs or groups. Approximately 10,000 popular reports will be mailed or distributed at meetings.

Do we have your organization's mailing list? Please send it to Richard Martin, Room 125A, State Office Building, Hartford, Connecticut .

The Future

Recommendations

1. We strongly recommend that this Task Force continue as a body until the end of the next session of the General Assembly.

2. We urge that Dr. Malone continue as chairman, and that all members of the Task Force serve on the Public Information Committee.

3. Membership in the Task Force will be opened to individuals or groups whose aims are compatible with those of the Task Force.

4. By staying together as a group we can help to inform the public and work toward encouraging the General Assembly to take action on our recommendations.

Because the Information Committee is the tool of the entire Task Force and because opportunities and ideas are constantly appearing, this report is not a final report but merely notes on our major activities to date.

Members of Committee on Information

Mrs. Roger Eddy, Chairman
Mrs. Elmer Watson, Vice Chairman
Miss Susan G. Freeman, Secretary
Al Bennett
Henry S. Bloomgarden
Mrs. John D. Briscoe
Arthur Crosbie
Mrs. Taber deForest
Mrs. Gerald Ewing
Ellsworth S. Grant
Robert Kneeland
Robert Joyce
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John R. Reitemeyer
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Resource People

George A. Mackie, Special Research Assistant, Office of the Governor
Malcolm H. Brinton, Chief, Education & Information, Board of Fisheries and Game
George S. Russell, Director, Administrative Services, Agriculture & Nat. Resources
Henry King, Director, Bureau of Business Administration, Agriculture and Natural Resources

COMMITTEE ON WATER LAW AND LEGISLATION

COMMITTEE ON WATER LAW AND LEGISLATION

The job of this subcommittee is twofold - first, to present a digest of existing water pollution control laws and, following adoption of a program by the Task Force, then to recommend legislation appropriate to implement that program.

A brief summary of existing law follows. In its preparation the subcommittee acknowledges its debt to Clyde O. Fisher, Jr., for his "Connecticut Law of Water Rights" Appendix A to Water Resources of Connecticut, Report to the General Assembly by the Water Resources Commission in 1957 and to Robert L. Leonard of the University of Connecticut for his "Water Rights in Connecticut, Existing Law and Future Possibilities." Copies of these documents may be obtained from the State Water Resources Commission and the Cooperative Extension Service, College of Agriculture, University of Connecticut, Storrs, respectively.

1. Existing pollution control laws in Connecticut find their origin in the common law of water rights which has developed from court litigation over several centuries in Anglo-Saxon countries and in a proliferation of statutes enacted without any common plan to deal with specific situations as they arose.

2. Common law (or judge-made law) seems bottomed on the needs and requirements of a rural society in which there was not only plenty of water for all uses but also adequate natural elimination of pollution if users acted "reasonably." Most judicial cases have arisen in connection with riparian rights, i.e., the right of the owner of property adjoining a natural water course, to the reasonable use of water in the stream so long as such use does not interfere with a similar use by a downstream owner. This doctrine does not seem suited to present-day Connecticut and its needs for clean water.

3. Until 1925, most statutory law was directed at the protection of public health by the prevention of pollution of water supplies. It is clear that the State Department of Public Health has authority to prevent pollution of public water supplies or other waters in the State in cases involving public health.

4. In 1925 comprehensive water pollution control and abatement legislation was enacted and an enforcing agency, the State Water Commission (now the Water Resources Commission) created. This legislation prohibited new pollution without a permit from the Commission, but it circumscribed the authority of the Commission in the case of existing sources of pollution. In essence it can stop existing pollution only after elaborate advice to the polluter as to a treatment system that is both reasonably available and equitable as to cost. The administrative burden thus placed on the Commission has prevented realistic control and elimination of industrial pollution.

5. With regard to the interplay of state and federal control of water pollution, existing law recognizes the lack of federal power except in the case of interstate and navigable waters. Thus the federal Water Quality Act of 1965 provides for the imposition of federal standards only for interstate waters and even then, only if the state has not imposed its own by June 30, 1967.

Whatever specific enabling legislation may be required for the program recommended by the Task Force, a new legal approach to water pollution seems necessary. Existing law might have been appropriate for the control of pollution in 19th century rural Connecticut but it is too haphazard for the efficient utilization of the water resources in the present-day industrialized and populous state.

What seems needed is the expansion of existing legislation into a water rights code tailored to the needs of this State. The essential elements of such a code are threefold - first, a declaration of the public ownership of all water; second, a statement of the conditions pertaining to the private use thereof; and finally, a statement of policy that pollution is illegal. The details of such a code, including a determination of the extent to which Connecticut requires an administered system regulating water use, will, of course, take further study and be determined by the specifics of the program adopted.

The conclusion is inescapable, however, that it is none too soon for the State to modernize its laws relating to water use in order to eliminate its existing pollution problems. For, without the elimination of pollution, a shortage of suitable water supplies is a certainty.

Members of Committee on Water Law and Legislation

Frank Chapman, Esq., Chairman
Joseph Wadsworth, Vice Chairman
Mrs. Taber deForest, Secretary
Wallace Barnes
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