

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUDGET JUSTIFICATIONS, F. Y. 1970



WATER QUALITY AND RESEARCH

**FEDERAL WATER POLLUTION
CONTROL ADMINISTRATION**

Federal Water Pollution Control Administration

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Highlight StatementObjectives and Goals

The primary objective of the Federal water pollution control program is to bring the quality of the water in our streams, lakes, estuaries and coastal areas up to levels which will provide adequate supplies for all foreseeable and appropriate uses. This will require a cooperative effort involving Federal, State and local levels of government. Some of the principal program emphases and goals to accomplish this objective must be:

1. State implementation plans, which constitute the framework for attaining approved water quality standards, must be complied with in accordance with time schedules.

2. A national water quality monitoring system will include essential data and statistical and scientific analyses required to make such monitoring meaningful. The system will be standardized to the maximum extent and fully coordinated with monitoring activities of States and interested Federal agencies, particularly USGS.

3. A systematic manpower development and training program to expand and maintain the breadth and depth of scientific, professional, and technical capabilities necessary in the water pollution control field. It is estimated that professional training will have to increase from a level of 500 trainees in 1969 to more than 1,400 in 1974 and that 6,000 waste treatment plant operators and 5,600 water quality technicians will have to be trained annually in the next five years.

4. Research programs must be selectively conducted to provide answers to pollution problems for which available treatment and control technology are inadequate or uneconomical. It should be noted that our continued emphasis on development of more efficient waste treatment methods will lead to the ability to completely eliminate pollutional discharges from point sources, i.e., allowing effectively "dry" municipalities and industries with no pollution load whatsoever. Furthermore, it is expected that by 1975 advanced waste treatment costs comparable with conventional cost of developing new municipal and industrial water supplies in water-shore areas will be achieved.

5. Federal financial assistance to encourage the construction of needed municipal waste treatment facilities, together with encouragement of improved operation and maintenance of such facilities.

Situation and Need

Water pollution is a growing national problem which can only be met through continuation of extensive abatement efforts at the Federal, State, and local level. It is both a result of, and a constraint upon, the development of our industrialized-urbanized society. The high levels of technology and concentration that have made possible massive production of goods demand enormous quantities of clean water. They also produce the waste materials that pollute water and increase the cost of supplying water for other uses.

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problems may be categorized in a number of ways, reflecting the problems by sources of water pollution appears to be the most convenient and effective way at the present time and are as follows with significant data from the aforementioned report highlighted where applicable.

Municipal Sources of Pollution

Municipal waste materials discharged into water or carried by natural runoff into water historically have received much of the attention devoted to water pollution control. A result is that over 90 percent of the sewered communities of the Nation currently treat their wastes with about 60 percent served by secondary waste treatment. In spite of this high prevalence of municipal waste treatment, investment requirements continue to rise to take care of replacement, upgrading, and treatment of industrial wastes. Therefore, the notion that costs would drop when some fixed backlog of need was eliminated appears to be a fallacy. An investment rate of \$2.9 billion for municipal treatment and collection works in 1968 would have provided reasonable progress toward meeting Water Quality Standards. However, it is estimated that actual expenditures totaled only \$1.3 billion. In addition, it is estimated on the basis of State Program Plans that States do not intend in the aggregate to significantly increase their rate of capital expenditure over the next five years. It should be noted that the level of investment outlined in State Program Plans is strongly conditioned by the anticipated level of Federal assistance. Therefore, unless this rate of investment is increased, the Nation will fall behind in its goal of providing and maintaining adequate waste treatment for its sewered communities.

In the area of combined sewers, which carry both sewage and storm water, municipalities have done little to correct pollution occurring during heavy rains when treatment plants are bypassed because of the added load. Only minimal efforts have been made to correct this problem by separating sewers or impounding such water for future treatment. The cost of solving this problem by the total separation of storm water from the sewage would amount to \$49 billion. Therefore, alternative methods for dealing with this problem are being sought and investigated to reduce this expense.

Industrial Sources of Pollution

Control of industrial wastes presents a quantitatively greater and qualitatively more difficult problem than does municipal waste treatment. Prevalence of industrial waste treatment is increasing rapidly, with one-half to three-quarters of the major water-using manufacturing establishments in the Nation currently estimated to have obtained the provisional 1973 program goal of secondary waste treatment. But, because industrial wastes are about three times as great in measurable pollutorial volume as are municipal wastes, they continue to account for a very significant portion of the existing pollution problem.

Last year's "Cost of Clean Water" report, based upon several necessarily tentative assumptions, estimated industrial waste treatment costs over the next five years at \$2.6 billion to \$4.6 billion and cooling requirements at \$1.8 billion. On the basis of limited information available and in the absence of an industrial waste inventory, industrial expenditures for waste treatment facilities in the last two years appeared to be close to target amounts established in the report. It should be noted that an industrial waste profile of the organic chemical industry prepared during the year indicates that to attain acceptable level of treatment in the next five years will require an expenditure of \$243 million alone, as compared to the initial estimate of slightly less than \$100 million.

Mining is a source of water pollution through at least three mechanisms. Sedimentation occurs through disturbance of land in strip-mining areas. Acids are formed through the reaction of water with exposed mineral seams. Dissolved mineral concentrations are increased--sometimes to the point of toxicity--through exposure of deposits to runoff and by pumping mines. Problems are complicated by the variety of possible sources of pollutants--pit mines, strip mines and tailing piles in both active and abandoned facilities. New technology must be developed and demonstrated to obtain effective and economical controls.

An estimated four million tons of acid mine drainage annually discharged into more than 4,000 miles of streams. Attempts to resolve or reduce such drainage have failed due to high costs, technical and institutional problems, for which there were no immediate solutions. Several research and development projects are in the final stages and others are being planned.

Studies and results of research contracts available since last year's report indicate that abatement of water pollution from acid mine drainage to meet water quality standards in some cases will require neutralization of acid discharges from active mines and of residual acid discharges from sealed abandoned mines. A summation of the estimated 20 year costs, in constant 1968 dollars, for reducing acid mine drainage ranges from \$1.7 billion for a 40 percent reduction to as much as \$6.6 billion for a 95 percent reduction. Here, again, the actual costs will depend upon the amount of reduction that is required in specific areas to meet water quality standards.

Problems related to oil production are of a different nature and solutions will be sought through laboratory and field work, including pilot-and field-scale demonstrations. Of significance is the fact that the cost of oil field brine disposal, if it were all required to be disposed of through injection methods, would fall in an estimated range from \$43 million to \$758 million. The actual costs would fall somewhere between these two figures, depending upon the weighted average costs of the treatments applied and the amount of this cost that can be regained through the beneficial effects of using injection as a secondary recovery method. The cost of chemical brine disposal cannot be estimated until information is available on the volume and character of the brine involved and the probable disposal methods that will be used.

Agricultural Sources of Pollution

Agricultural practices are the sources of a number of water quality problems, including some of vast regional significance. Solutions to these problems may be possible through regulation or by bringing about effective changes in agricultural practices. FWPCA has undertaken the development of a research framework to more specifically identify point sources of pollution associated with agricultural wastes. The further development of this framework will provide the focus for direction of the total Federal effort and involvement in the search for solutions. Salinity and pesticide pollution problems are two significant areas of concern. However, present information is not available to estimate scope and cost of correcting these problems. Effective programs on any level will be dependent on coordination of FWPCA activities and interest with those of the Department of Agriculture, the Bureau of Reclamation, and other agencies with a direct interest and competence in the agricultural area.

Other Sources of Pollution

Other sources of water pollution are less significant only in that they are

a continuous problem and can result in a catastrophe as exemplified by the Torrey Canyon incident. Continued emphasis will be given to devising adequate control programs in all these areas.

Proposed Program for 1970

The proposed program, although considerably constrained due to the national fiscal situation, will still enable FWPCA to continue pressing forward toward achieving its objectives and goals. The program elements that will receive additional attention or emphasis are as follows:

1. The waste treatment facilities construction grant program proposal provides for the same level as 1969.
2. Research, development and demonstration effort will be accelerated with strong emphasis on demonstration involving in-house activity as well as continuing to provide contracts and grants to industry, public agencies and universities in order to develop improved or new techniques to combat water pollution.
3. Coordination and management of water quality standards will be maintained throughout the Nation to continue the orderly enhancement of the Nation's water resources.
4. The monitoring program developed in conjunction with USGS and the States to assure compliance with water quality standards will be strengthened and expanded.
5. Enforcement capability is proposed to be strengthened to assure prompt and effective action if established water quality standards are violated, the health or welfare of persons is endangered by pollution and if pollution is making shellfish unmarketable.
6. Planning in coordination with Federal, State and local agencies will be continued with emphasis on comprehensive river basin planning.
7. Technical support resources will continue to be provided to enable assistance to other FWPCA programs, State and other Federal agencies, communities and industries, in applying up-to-date technology on diversified and difficult pollution problems.
8. Training will be given special attention to help meet the rapidly growing demand for skilled manpower with particular attention to training professionals and waste treatment plant operators.
9. FWPCA assistance to other Federal agencies for abating and controlling water pollution from their installations and activities will expand to provide not only effective but more timely assistance.
10. Additional resources are proposed to provide adequate administrative support to expanding FWPCA programs and to carry out an effective public awareness program.
11. Of significant importance will be the initiation of planning for a multipurpose--regional office and laboratory--facility to support FWPCA activities in the Southwest Pacific area.

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Proposed Program for 1970

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1. The waste treatment facilities construction grant program proposal provides for the same level as 1969. However, it should be noted that legislation has been proposed which would authorize an additional and new method of financing the Federal share for constructing municipal waste treatment facilities. The level of such financing each fiscal year would require the approval of the Appropriation Committees.

2. Research, development and demonstration effort will be accelerated with strong emphasis on demonstration involving in-house activity as well as continuing to provide contacts and grants to industry, public agencies and universities in order to develop improved or new techniques to combat water pollution.

3. Coordination and management of water quality standards will be maintained throughout the Nation to continue the orderly enhancement of the Nation's water resources.

4. The monitoring program developed in conjunction with USGS and the States to assure compliance with water quality standards will be strengthened and expanded.

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7. Additional technical support resources will be provided to enable assistance to other FWPCA programs, State and other Federal agencies, communities and industries, in applying up-to-date technology on diversified and difficult pollution problems.

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9. FWPCA assistance to other Federal agencies for abating and controlling water pollution from their installations and activities will expand to provide not only effective but more timely assistance.

10. Additional resources are proposed to provide adequate administrative support to expanding FWPCA programs and to carry out an effective public awareness program.

11. Of significant importance will be the initiation of planning for a

direction and implementation to existing and future programs.

NOTE: Accomplishments are highlighted under each activity.

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Obligations by Appropriation

| | FY 1968 <u>Actual</u> | FY 1969 <u>Estimate</u> | FY 1970 <u>Estimate</u> | Increase Decrease <u>Over 196</u> |
|--|--------------------------|----------------------------|----------------------------|---|
| ion Control Operations and Research..... | \$82,880,835 | \$108,110,001 | \$93,851,000 | -\$14,259 |
| ngs and Facilities..... | 1,218,932 | 3,379,069 | 800,000 | -2,579 |
| uction Grants for Waste Treatment Works..... | 193,978,023 | 216,358,528 | 227,000,000 | +10,641 |
| Total..... | 278,077,790 | 327,847,598 | 321,651,000 | -6,196 |

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
New Obligational Authority by Appropriation

| | <u>FY 1968</u> <u>Actual</u> | <u>FY 1969</u> <u>Estimate</u> | <u>FY 1970</u> <u>Estimate</u> | <u>Increase</u> <u>Decrease</u> <u>Over 1968</u> |
|--|---------------------------------|-----------------------------------|-----------------------------------|--|
| Pollution Control Operations and Research..... | \$92,181,695 | \$86,849,846 | \$91,972,000 | +\$5,122,154 |
| Buildings and Facilities..... | ... | ... | ... | |
| Construction Grants for Waste Treatment Works..... | <u>203,000,000</u> | <u>214,000,000</u> | <u>214,000,000</u> | |
| Total..... | 295,181,695 | 300,849,846 | 305,972,000 | +5,122,154 |

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

Budget Estimates Compared to Authorizations

1 Water Pollution Control Act, as amended

| <u>n of Act</u> | FY 1969 | | FY 1970 | |
|---|----------------------|-------------------------|----------------------|-------------------------|
| | <u>Authorization</u> | <u>NOA Estimate</u> | <u>Authorization</u> | <u>NOA Estimate</u> |
| n 5-- <u>Research, Investigations, Training and Information</u> | | | | |
| rry out all of Section 5 other than subsection (g)..... | \$65,000,000 | \$33,806,846 | a/ | \$37,782,0 |
|)--Estuary studies..... | 1,000,000 | 720,000 | a/ | 300,0 |
| n 6-- <u>Research and Development Grants</u> | | | | |
| neral authorization provided for the purposes set forth | | | | |
| in entire section including contracts..... | 20,000,000 | 5,700,000 | a/ | 5,700,0 |
|)(2)--Advanced waste treatment and joint waste treatment | 20,000,000 | 4,900,000 | a/ | 4,900,0 |
|)--Industrial wastes..... | 20,000,000 | 9,368,000 | a/ | 9,400,0 |
| n 7-- <u>Grants for Water Pollution Control Program</u> | 10,000,000 | 10,000,000 | \$10,000,000 | 10,000,0 |
| n 8-- <u>Grants for Construction</u> | 700,000,000 | 214,000,000 | 1,000,000,000 | 214,000,0 |
| Total..... | 836,000,000 | 278,494,846 | 1,010,000,000 | 282,082,0 |

Authorizations expire as of June 30, 1969. However, legislation has been proposed to extend appropriation authorizations.

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

Budget Estimates Compared to Authorizations

1 Water Pollution Control Act, as amended

| Section of Act | FY 1969 | | FY 1970 | |
|---|---------------|-----------------|---------------|--------------|
| | Authorization | NOA Estimate | Authorization | Estimate |
| Section 5--Research, Investigations, Training and Information Carry out all of Section 5 other than subsection (g)..... | \$65,000,000 | \$33,806,846 | a/ | \$37,430,000 |
| (1)--Estuary studies..... | 1,000,000 | 720,000 | a/ | 300,000 |
| Section 6--Research and Development Grants General authorization provided for the purposes set forth in entire section including contracts..... | 20,000,000 | 5,700,000 | a/ | 5,700,000 |
| (2)--Advanced waste treatment and joint waste treatment | 20,000,000 | 4,900,000 | a/ | 4,900,000 |
| (3)--Industrial wastes..... | 20,000,000 | 9,368,000 | a/ | 9,400,000 |
| Section 7--Grants for Water Pollution Control Program..... | 10,000,000 | 10,000,000 | \$10,000,000 | 10,000,000 |
| Section 8--Grants for Construction..... | 700,000,000 | 214,000,000 | 1,000,000,000 | 214,000,000 |
| Total..... | 836,000,000 | 278,494,846 | 1,010,000,000 | 281,730,000 |

Authorizations expire as of June 30, 1969. However, legislation has been proposed to extend appropriation authorizations.

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Relating New Obligational Authority to Applicable Section of
Water Pollution Control Act, P.L. 660, as amended

| <u>Section of Act</u> | <u>Appropriation Title</u> | <u>Budget Activity</u> | <u>1969 Estimate</u> | <u>1970 Estimate</u> | <u>Increase Decrease over 1969</u> |
|---|---|---|---|---|--|
| 2--Deposit to Treasury, to limit of civil service retire- ment, applicable funds for training commissioned officers. | Pollution Control Operations and Research | Civil service retire- ment fund..... | \$158,000 | ... | -\$158,000 |
| 3--Comprehensive Programs under Pollution Control | Pollution Control Operations and Research | Comprehensive basin planning (a) Grants..... (b) Federal planning and studies..... | 1,250,000 7,877,000 | 2,000,000 7,935,000 | +750,000 +58,000 |
| | | Total, Section 3... | 9,127,000 | 9,935,000 | +808,000 |
| 4--Interstate Cooperation under Form Laws | Pollution Control Operations and Research | Enforcement..... | (Carried out by enforcement staff) | | |
| 5--Research, Investigations, and Information | Pollution Control Operations and Research | Research, development and demonstration Research grants..... Demonstration grants. Contracts..... Direct operations.... Estuarine studies..... Technical support..... Pollution surveillance. Training Project grants..... Fellowships..... Manpower development and training..... | 6,500,000 2,500,000 4,504,000 10,196,846 720,000 3,374,000 1,928,000 3,400,000 600,000 804,000 | 6,500,000 2,500,000 4,822,000 11,672,000 300,000 3,529,000 3,133,000 4,020,000 600,000 1,006,000 | +318,000 +1,475,000 -420,000 +155,000 +1,205,000 +202,000 |

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Relating New Obligational Authority to Applicable Section of
Water Pollution Control Act, P.L. 660, as amended

| Section of Act | Appropriation Title | Budget Activity | 1969 Estimate | 1970 Estimate | Increase or Decrease over |
|--|---|---|---|---|--|
| 2--Deposit to Treasury, to limit of civil service retirement, applicable funds for training commissioned officers. | Pollution Control Operations and Research | Civil service retirement fund..... | \$158,000 | ... | -\$15 |
| 3--Comprehensive Programs for Pollution Control | Pollution Control Operations and Research | Comprehensive basin planning (a) Grants..... (b) Federal planning and studies..... | 1,250,000 7,877,000 | 2,000,000 7,935,000 | +75 +5 |
| | | Total, Section 3... | 9,127,000 | 9,935,000 | +80 |
| 4--Interstate Cooperation from Laws | Pollution Control Operations and Research | Enforcement..... | (Carried out by enforcement staff) | | |
| 5--Research, Investigations, and Information | Pollution Control Operations and Research | Research, development and demonstration Research grants..... Demonstration grants. Contracts..... Direct operations.... Estuarine studies..... Technical support..... Pollution surveillance. Training Project grants..... Fellowships..... Manpower development and training..... | 6,500,000 2,500,000 4,504,000 10,196,846 720,000 3,374,000 1,928,000 3,400,000 600,000 804,000 | 6,500,000 2,500,000 4,504,000 11,990,000 300,000 3,750,000 2,600,000 3,980,000 600,000 1,006,000 | +1,79 -42 +37 +67 +58 +20 |

| <u>Section of Act</u> | <u>Appropriation Title</u> | <u>Budget Activity</u> | <u>1969 Estimate</u> | <u>1970 Estimate</u> | <u>Increase or Decrease over 1969</u> |
|--|---|--|----------------------|-------------------------|---------------------------------------|
| Section 5--continued | Buildings and Facilities | Water pollution control and water quality standards laboratories. | ... | ... | |
| | | Field evaluations..... | ... | ... | |
| | | Total, Section 5..... | 34,526,846 | 38,082,000 ^a | +3,555,154 |
| Section 6--Grants for Research and Development | Pollution Control Operations and Research | Research, development and demonstration grants and contracts | | | |
| | | Storm and combined sewer..... | 5,700,000 | 5,700,000 | |
| | | Advanced waste treatment..... | 4,900,000 | 4,900,000 | |
| | | Industrial wastes..... | 9,368,000 | 9,400,000 | +32,000 |
| | | Total, Section 6..... | 19,968,000 | 20,000,000 ^a | +32,000 |
| Section 7--Grants for Water Pollution Control Programs | Pollution Control Operations and Research | State and interstate agency program grants.. | 10,000,000 | 10,000,000 | |
| Section 8--Grants for Construction | Construction Grants for Waste Treatment Works | Waste treatment works construction..... | 214,000,000 | 214,000,000 | |
| | Pollution Control Operations and Research | Construction grants administration..... | 2,406,000 | 2,698,000 | +292,000 |
| | | Total, Section 8..... | 216,406,000 | 216,698,000 | +292,000 |
| Section 9--Water Pollution Control Agency Board | Pollution Control Operations and Research | Direction, coordination and management support | 62,000 | 62,000 | |

Authorizations expire June 30, 1969. However, legislation has been proposed to extend appropriation authorizations.

| <u>Section of Act</u> | <u>Appropriation Title</u> | <u>Budget Activity</u> | <u>1969 Estimate</u> | <u>1970 Estimate</u> | <u>Increase or Decrease</u> |
|--|---|---|----------------------|--------------------------|-----------------------------|
| 5--continued | Buildings and Facilities | Water pollution control and water quality standards laboratories. | ... | ... | |
| | | Field evaluations..... | ... | ... | |
| | | Total, Section 5..... | 34,526,846 | 37,730,000 ^{a/} | +3,20 |
| 6--Grants for Research and Development | Pollution Control Operations and Research | Research, development and demonstration grants and contracts | | | |
| | | Storm and combined sewer..... | 5,700,000 | 5,700,000 | |
| | | Advanced waste treatment..... | 4,900,000 | 4,900,000 | |
| | | Industrial wastes..... | 9,368,000 | 9,400,000 | +3 |
| | | Total, Section 6..... | 19,968,000 | 20,000,000 ^{a/} | +3 |
| 7--Grants for Water Pollution Control Programs | Pollution Control Operations and Research | State and interstate agency program grants.. | 10,000,000 | 10,000,000 | |
| 8--Grants for Construction | Construction Grants for Waste Treatment Works | Waste treatment works construction..... | 214,000,000 | 214,000,000 | |
| | Pollution Control Operations and Research | Construction grants administration..... | 2,406,000 | 3,050,000 | +64 |
| | | Total, Section 8..... | 216,406,000 | 217,050,000 | +64 |
| 9--Water Pollution Control Board | Pollution Control Operations and Research | Direction, coordination and management support | 62,000 | 62,000 | |

Authorizations expire June 30, 1969. However, legislation has been proposed to extend appropriation authorizations.

| Section of Act | Appropriation Title | Budget Activity | 1969 Estimate | 1970 Estimate | Increase or Decrease over 1969 |
|---|---|--|----------------------|---|--------------------------------|
| Section 10--Enforcement Measures to Control Pollution of Interstate Navigable Waters | Pollution Control Operations and Research | Enforcement..... Water quality standards coordination & management | 3,587,000 752,000 | 3,700,000 752,000 | +113 |
| | | Total, Section 10..... | 4,339,000 | 4,452,000 | +113 |
| Section 11--Cooperation to Control Pollution from Federal Installations (Executive Order 11288) | Pollution Control Operations and Research | Control of pollution from Federal installations.. | 796,000 | 900,000 | +104 |
| Section 12--Administration | Pollution Control Operations and Research | Direction, coordination and management support. Public information..... | 4,479,000 518,000 | 4,591,000 564,000 | +112 + 46 |
| | | Total, Section 12..... | 4,997,000 | 5,155,000 | +158 |
| Section 16--Separability | Pollution Control Operations and Research | Comprehensive basin planning..... Direction, coordination and management support. | 147,000 65,000 | 365,000 65,000 | +218 |
| | | Total, Section 16.... | 212,000 | 430,000 | +218 |
| | | TOTAL, P.L. 660, AS AMENDED... | 300,591,846 | 305,714,000 | +5,122, |
| Section 17--Pollution Act, 1924 | Pollution Control Operations and Research | Enforcement..... Technical support..... |)) | No special funds earmarked to carry out the provisions of this Act. Existing resources programmed for activities shown are utilized for this purpose. | |
| Section 18--507 Government Employees Paying Act | Pollution Control Operations and Research | Graduate training..... | 258,000 | 258,000 | |
| | | GRAND TOTAL..... | 300,849,846 | 305,972,000 | +5,122, |

| Section of Act | Appropriation Title | Budget Activity | 1969 Estimate | 1970 Estimate | Increase or Decrease |
|---|---|---|---|---------------|----------------------|
| 10--Enforcement Measures | Pollution Control Operations and Research | Enforcement..... | 3,587,000 | 3,700,000 | +1 |
| Pollution of Interstate Navigable Waters | | Water quality standards coordination & management | 752,000 | 752,000 | |
| | | Total, Section 10..... | 4,339,000 | 4,452,000 | +1 |
| 11--Cooperation to Control Pollution from Federal Installations (Executive Order 11288) | Pollution Control Operations and Research | Control of pollution from Federal installations.. | 796,000 | 900,000 | +1 |
| 12--Administration | Pollution Control Operations and Research | Direction, coordination and management support. | 4,479,000 | 4,551,000 | + |
| | | Public information..... | 518,000 | 604,000 | + |
| | | Total, Section 12..... | 4,997,000 | 5,155,000 | +1 |
| 16--Separability | Pollution Control Operations and Research | Comprehensive basin planning..... | 147,000 | 365,000 | +2 |
| | | Direction, coordination and management support. | 65,000 | 65,000 | |
| | | Total, Section 16.... | 212,000 | 430,000 | +2 |
| | | TOTAL, P.L. 660, AS AMENDED... | 300,591,846 | 305,714,000 | +5,12 |
| Pollution Act, 1924 | Pollution Control Operations and Research | Enforcement..... | No special funds earmarked to carry out the provisions of this Act. Existing resources programmed for these activities shown are utilized for this purpose. | | |
| | | Technical support..... | | | |
| 507 Government Employees Act | Pollution Control Operations and Research | Graduate training..... | 258,000 | 258,000 | |
| | | GRAND TOTAL..... | 300,849,846 | 305,972,000 | +5,12 |

Pollution Control Operations and Research

DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
Pollution Control Operations and Researcha/

| | |
|--|-----------|
| ation, 1968..... | \$92,800, |
| red to: | |
| ating expenses, Public Buildings Service," General Services Administration..... | -218, |
| ies and expenses, Office of the Solicitor," Department of the Interior..... | -144, |
| ies and expenses, Office of Oil and Gas," Department of the Interior..... | -23, |
| ies and expenses, Office of the Secretary," Department of the Interior..... | -233, |
| ive transfer from "Construction grants for waste treatment works"..... | +11,875, |
| Total available, 1968..... | 104,057, |
| Total appropriation, 1969..... | 88,838, |
| ated balance transferred from "Construction grants for waste treatment works"..... | +4,334, |
| ated balance from prior years..... | +18,804, |
| ated balance available, end of year..... | -1,879, |
| to: | |
| ating expenses, Public Buildings Service," General Services Administration..... | -114, |
| transfer to: | |
| of Land Management, Department of the Interior..... | -1,628, |
| of Indian Affairs, Department of the Interior..... | -246, |
| Total available, 1969..... | 108,110, |
| ously titled "Water supply and water pollution control." | |

of Increases and Decreases, 1970

| | <u>Base for 1970</u> | <u>Increase 1970</u> | |
|--|----------------------|----------------------|-----------|
| <u>h, development and demonstration</u> | | | |
| Decrease for grant and contract effort due to new obligational authority for 1969 and balances brought forward from 1968 | | | |
| Meeting request for 1970..... | \$54,732,155 | -\$20,910,001 | |
| Coordinate Federal efforts in FWPCA laboratories, field studies | | | |
| demonstrations and technical management for grants and contracts | 10,196,846 | +1,462,000 | |
| Net increased pay costs..... | ... | +13,000 | -\$19,435 |
| <u>g, assistance and training activities</u> | | | |
| Provide financial assistance for new river basin planning agencies and increased support for those initiated in 1969..... | 1,250,000 | +750,000 | |
| Provide for expansion and detail in more depth the National Requirements and Cost Study Reports; increase for economic and statistical analyses and projections..... | 8,024,000 | +263,000 | |
| Expense due to final report required on effects of pollution in quarries to be submitted to Congress in mid-1970..... | 720,000 | -420,000 | |
| Provide more effective, but more importantly, timely aid to other Federal agencies to control pollution resulting from their activities..... | 796,000 | +101,000 | |
| Provide technical support resources required to meet the increasing diversified requests for assistance in applying existing knowledge to specific water pollution problems..... | 3,374,000 | +150,000 | |
| Provide for expansion or initiation of activity required in the selection, evaluation and dissemination of water pollution control water quality data..... | 1,928,000 | +1,203,000 | |
| Provide additional manpower resources necessary to cope with the increased work load for administering the grants for construction waste treatment works..... | 2,406,000 | +287,000 | |
| Coordinate professional and technical manpower training in water pollution control field through increased grant funding and staff support..... | 5,062,000 | +821,000 | |
| Net increased pay costs..... | ... | +29,000 | +3,184 |

of Increases and Decreases, 1970

| | <u>Base for 1970</u> | <u>Increase 1970</u> | |
|---|----------------------|----------------------|---------|
| <u>Research, development and demonstration</u> | | | |
| Decrease for grant and contract effort due to new obligational authority for 1969 and balances brought forward from 1968 | | | |
| Seedling request for 1970..... | \$54,732,155 | -\$21,228,001 | |
| Coordinate Federal efforts in FWPCA laboratories, field studies | | | |
| and demonstrations and technical management for grants and contracts | 10,196,846 | +1,780,000 | |
| to meet increased pay costs..... | ... | +13,000 | -\$19,1 |
| <u>Planning, assistance and training activities</u> | | | |
| Provide financial assistance for new river basin planning agencies and increased support for those initiated in 1969..... | 1,250,000 | +750,000 | |
| Provide for expansion and detail in more depth the National Requirements and Cost Study Reports; increase for economic and statistical analyses and projections..... | 8,024,000 | +263,000 | |
| Decrease due to final report required on effects of pollution in hearings to be submitted to Congress in mid-1970..... | 720,000 | -420,000 | |
| Provide more effective, but more importantly, timely aid to other Federal agencies to control pollution resulting from their activities..... | 796,000 | +101,000 | |
| Decrease technical support resources required to meet the increasing and diversified requests for assistance in applying existing knowledge to specific water pollution problems..... | 3,374,000 | +371,000 | |
| Provide for expansion or initiation of activity required in the collection, evaluation and dissemination of water pollution control and water quality data..... | 1,928,000 | +670,000 | |
| Provide additional manpower resources necessary to cope with the increased work load for administering the grants for construction waste treatment works..... | 2,406,000 | +639,000 | |
| Coordinate professional and technical manpower training in water pollution control field through increased grant funding and staff support..... | 5,062,000 | +781,000 | |
| to meet increased pay costs..... | ... | +29,000 | +3,1 |

| | <u>Base for 1970</u> | <u>Increase 1970</u> | |
|--|----------------------|----------------------|--------------------|
| <u>ent</u> | | | |
| e adequate capability to carry out enforcement activities | | | |
| ctions as needed..... | 3,587,000 | +109,000 | |
| t increased pay costs..... | ... | <u>+4,000</u> | +113,000 |
| <u>e direction and support</u> | | | |
| t additional staff for headquarters to strengthen automation | | | |
| gement and to meet the increased work load in accounting | | | |
| ations; nonrecurring costs of consolidating headquarters staff | | | |
| ystal Mall, Virginia..... | 3,111,000 | +104,000 | |
| vide additional professional and material capability for | | | |
| onal direction and dissemination of information..... | 518,000 | +45,000 | |
| se due to nonrecurring payment to civil service retirement fund, | | | |
| equired by law, for Public Health Service commissioned officers | | | |
| converted to civil service status in order to remain with | | | |
| A..... | 158,000 | -158,000 | |
| t increased pay costs..... | ... | <u>+9,000</u> | ... |
| Net increase, 1970..... | | | <u>-16,138,001</u> |
| Budget estimate, 1970..... | | | 91,972,000 |

| | <u>Base for 1970</u> | <u>Increase 1970</u> | |
|---|----------------------|----------------------|-----------|
| it | | | |
| adequate capability to carry out enforcement activities | | | |
| tions as needed..... | 3,587,000 | +109,000 | |
| increased pay costs..... | ... | +4,000 | +113,00 |
| <u>direction and support</u> | | | |
| additional staff for headquarters to strengthen automation | | | |
| ement and to meet the increased work load in accounting | | | |
| tions; nonrecurring costs of consolidating headquarters staff | | | |
| ystal Mall, Virginia..... | 3,111,000 | -21,000 | |
| ide additional clerical staff in regional offices to provide | | | |
| ing personnel and programs with adequate management support | | | |
| ities..... | 1,495,000 | +85,000 | |
| ide additional professional and material capability for | | | |
| nal direction and dissemination of information and secretarial | | | |
| rt for regional information officers..... | 518,000 | +85,000 | |
| e due to nonrecurring payment to civil service retirement fund, | | | |
| quired by law, for Public Health Service commissioned officers | | | |
| onverted to civil service status in order to remain with | | | |
| ..... | 158,000 | -158,000 | |
| increased pay costs..... | ... | +9,000 | . |
| Net increase, 1970..... | | | -16,138,C |
| Budget estimate, 1970..... | | | 91,972,C |

Pollution Control Operations and Research^{a/}

| Activity | Analysis by Activities | | | | |
|--|---|------------------------|--------------------------|-----------------------------|---------------------|
| | Fiscal Year 1968 Amount Available | Fiscal Year 1969 | | | Amount Available |
| | | Total Appropriation | Pay Cost Supplemental | Transfers | |
| development and demonstration..... | \$43,044,568 | \$43,699,000 | ... | +\$23,109,001 ^{b/} | \$66,808,000 |
| assistance and training activities... | 32,053,595 | 34,369,000 | ... | -57,000 ^{c/} | 34,312,000 |
| nt..... | 3,020,578 | 3,598,000 | ... | -11,000 ^{c/} | 3,587,000 |
| direction and support..... | 4,762,094 | 5,298,000 | ... | -16,000 ^{c/} | 5,282,000 |
| ed balance lapsing..... | 2,371,917 | ... | ... | ... | ... |
| ed balance available, end of year..... | ... | ... | ... | -1,879,000 | -1,879,000 |
| transfer to other accounts for pay e..... | ... | 1,874,000 | ... | -1,874,000 | ... |
| Total..... | 85,252,752 | 88,838,000 | ... | +19,272,001 | 108,110,000 |

ously titled "Water supply and water pollution control."

des -\$30,154 transferred to General Services Administration; +\$4,334,306 unobligated balance transferred from
struction grants for waste treatment works"; and +\$18,804,849 unobligated balance from prior year.

ferred to General Services Administration.

Pollution Control Operations and Research^{a/}

| | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 compared with 1969</u> | <u>P R</u> |
|---|---|---|-----------------------------|---|----------------|
| Development and demonstration..... | \$43,044,568 | \$64,929,001 | \$45,494,000 | -\$19,435,001 | 1 |
| Assistance and training activities..... | 32,053,595 | 34,312,000 | 37,496,000 | +3,184,000 | 4 |
| ..... | 3,020,578 | 3,587,000 | 3,700,000 | +113,000 | 9 |
| Direction and support..... | 4,762,094 | 5,282,000 | 5,282,000 | ... | 10 |
| Unexpended balance lapsing..... | 2,371,917 | ... | ... | ... | ... |
| Total..... | <u>85,252,752</u> | <u>108,110,001</u> | <u>91,972,000</u> | <u>-16,138,001</u> | |

Project titled "Water supply and water pollution control."

Research, development, and demonstration

ch, development and demonstration

| <u>m Elements</u> | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+ or Decrease 1970 compared with 1969)</u> |
|---|---|---|-----------------------------|---|
| pal-Pollution Control Technology..... | \$12,920,269 | \$19,808,990 | \$10,632,000 | -\$9,176,9 |
| rial-Pollution Control Technology..... | 6,157,019 | 12,020,779 | 6,315,000 | -5,705,7 |
| ltural-Pollution Control Technology..... | 905,459 | 2,413,175 | 1,384,000 | -1,029,1 |
| -Pollution Control Technology..... | 2,302,759 | 5,181,167 | 3,201,000 | -1,980,1 |
| Sources-of-Pollution Control Technology..... | 723,255 | 3,804,176 | 3,332,000 | -472,1 |
| Quality Control Technology..... | 6,748,095 | 8,551,613 | 8,993,000 | +441,3 |
| Treatment and Ultimate Disposal Technology..... | 9,864,440 | 8,465,101 | 6,720,000 | -1,745,1 |
| Quality Requirements Research..... | 3,392,272 | 4,684,000 | 4,917,000 | +233,0 |
| gated balance lapsing..... | 1,472,184 | ... | ... | |
| Total..... | <u>44,485,752</u> | <u>64,929,001</u> | <u>45,494,000</u> | <u>-19,435,0</u> |

ch, development and demonstration

| <u>n Elements</u> | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase or Decrease 1970 compared with 1969</u> |
|--|---|---|-----------------------------|---|
| al-Pollution Control Technology..... | \$12,920,269 | \$19,808,990 | \$10,608,000 | -\$9,200,990 |
| cial-Pollution Control Technology..... | 6,157,019 | 12,020,779 | 6,344,000 | -5,676,779 |
| tural-Pollution Control Technology..... | 905,459 | 2,413,175 | 1,404,000 | -1,008,716 |
| -Pollution Control Technology..... | 2,302,759 | 5,181,167 | 3,241,000 | -1,940,167 |
| Sources-of-Pollution Control Technology..... | 723,255 | 3,804,176 | 3,284,000 | -520,176 |
| Quality Control Technology..... | 6,748,095 | 8,551,613 | 8,950,000 | +398,387 |
| reatment and Ultimate Disposal Technology..... | 9,864,440 | 8,465,101 | 6,733,000 | -1,732,101 |
| Quality Requirements Research..... | 3,392,272 | 4,684,000 | 4,930,000 | +246,000 |
| gated balance lapsing..... | 1,472,184 | ... | ... | |
| Total..... | <u>44,485,752</u> | <u>64,929,001</u> | <u>45,494,000</u> | <u>-19,435,001</u> |

arch, development and demonstration (continued)

| <u>entional Budget Elements</u> | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 compared with 1969</u> |
|--|---|---|-----------------------------|---|
| ts, contracts, and Federal operations: | | | | |
| mbined sewer..... | \$8,644,071 ^{a/} | \$11,166,141 ^{b/} | \$5,700,000 | -\$5,466,11 |
| vanced waste treatment..... | 5,826,050 ^{a/} | 11,794,950 ^{b/} | 4,900,000 | -6,894,95 |
| ustrial wastes..... | 6,600,936 ^{a/} | 18,267,064 ^{b/} | 9,400,000 | -8,867,06 |
| onstration grants..... | 2,227,889 | 2,500,000 | 2,500,000 | .. |
| search grants..... | 6,380,191 | 6,500,000 | 6,500,000 | .. |
| search contracts..... | 4,146,521 | 4,504,000 | 4,822,000 | +318,00 |
| rect operations..... | 9,187,910 | 10,196,846 | 11,672,000 | +1,475,15 |
| obligated balance lapsing..... | 1,472,184 | ... | ... | .. |
| Total..... | <u>44,485,752</u> | <u>64,929,001</u> | <u>45,494,000</u> | <u>-19,435,00</u> |

summary table on page 44 for distribution of grant, contract and in-house funds by program element. Transfers of arch, development and demonstration funds heretofore appropriated under "Construction grants for waste treatment s."

cludes \$11,875,906 comparative transfer from "Construction grants for waste treatment works."
cludes \$4,334,306 unobligated balance transferred from "Construction grants for waste treatment works."

arch, development and demonstration (continued)

| entional Budget Elements | FY 1968 Amount Available | FY 1969 Amount Available | FY 1970 Estimate | Increase (or Decrease 1970 compa with 196 |
|--|--------------------------------|--------------------------------|---------------------|---|
| ts, contracts, and Federal operations: | | | | |
| mbined sewer..... | \$8,644,071 ^{a/} | \$11,166,141 ^{b/} | \$5,700,000 | -\$5,466 |
| vanced waste treatment..... | 5,826,050 ^{a/} | 11,794,950 ^{b/} | 4,900,000 | -6,894 |
| ustrial wastes..... | 6,600,936 ^{a/} | 18,267,064 ^{b/} | 9,400,000 | -8,867 |
| monstration grants..... | 2,227,889 | 2,500,000 | 2,500,000 | |
| search grants..... | 6,380,191 | 6,500,000 | 6,500,000 | |
| search contracts..... | 4,146,521 | 4,504,000 | 4,504,000 | |
| rect operations..... | 9,187,910 | 10,196,846 | 11,990,000 | +1,793 |
| obligated balance lapsing..... | 1,472,184 | ... | ... | |
| Total..... | 44,485,752 | 64,929,001 | 45,494,000 | -19,435 |

summary table on page 44 for distribution of grant, contract and in-house funds by program element. Transfers arch, development and demonstration funds heretofore appropriated under "Construction grants for waste treatmer s."

ncludes \$11,875,906 comparative transfer from "Construction grants for waste treatment works."
ncludes \$4,334,306 unobligated balance transferred from "Construction grants for waste treatment works."

scientific and engineering knowledge and skilled manpower to apply that knowledge. A great deal of progress in water pollution control can, of course, be made with existing technology, but the need for new technology becomes strikingly evident when the amount and complexity of wastes produced by municipal, industrial, agricultural and other users of water are assessed and evaluated. A prime research and development objective is to develop, by 1975, feasible techniques for complete elimination of point-source wastes as well as to develop and demonstrate technology for the renovation of waste waters for reuse. Nonpoint sources of pollution, e.g., runoff, acid mine drainage, etc., are less amenable to a predictable solution but nonetheless, it is expected that major steps in developing technology for controlling such pollution will be accomplished by 1975.

FWPCA's research, development, and demonstration program effort is divided into eight subprograms, five of which are oriented to specific sources of pollution and three of which develop information and technology to be applied to multisource pollution problems:

Specific Source Subprograms

Municipal-Pollution Control Technology
Industrial-Pollution Control Technology
Agricultural-Pollution Control Technology
Mining-Pollution Control Technology
Other-Sources-of-Pollution Control Technology

Multisource Subprograms

Water Quality Control Technology
Waste Treatment and Ultimate Disposal Technology
Water Quality Requirements Research

In conducting work under these eight research subprograms, in-house effort at seven authorized laboratory locations and at a variety of field sites across the country is contemplated in 1970. These efforts will be supported by extramural projects funded under FWPCA's research grant, demonstration grant and research and development grant and contract authorities under Sections 5 and 6 of the Federal Water Pollution Control Act, as amended.

Grants are employed in meeting objectives where it is desirable to utilize the State, municipality, intermunicipal or interstate agency, public and private institutional, industrial and individual talents and expertise in carrying out research, development and demonstration efforts on a cost-sharing basis resulting in mutual benefit to the Federal Government and the grantee.

Contracts are utilized for laboratory investigations and pilot-scale research projects which involve a large degree of uncertainty and which are primarily aimed at determination of feasibility. The latter are not the type of projects that municipalities and private corporations will readily sponsor with matching funds as under the grant procedure due to the large degree of risk as to future self-benefits. The work performed under contract requires the application of highly specialized personnel and equipment and of facilities having a high value over a short period of time, but of limited value as a long-term, capital investment.

The in-house research efforts are conducted at operational regional water pollution control laboratories in Ada, Oklahoma; Athens, Georgia; Cincinnati, Ohio; College, Alaska; and Corvallis, Oregon; in the National Water Quality Laboratory

Pomona and Firebaugh, California; Ely, Minnesota; Blue Plains, Washington, D. C.; and Norton, West Virginia.

The decrease in 1970 over 1969 of \$19,435,155 should not be construed as a designed effort to reduce the program. The effort proposed for 1968 was not accomplished as anticipated and, therefore, over \$23 million of grant and contract funds have been carried over from 1968 and are available for 1969. The 1970 estimate includes \$1,825,154 more in new obligational authority than that appropriated for 1969. Most grant and contract projects begun in 1968 and 1969 will continue into 1970. The continuation of these efforts, coupled with those projects to be initiated in 1970, will require small increases in staffing for both in-house execution of the program and the direction and coordination of existing extramural grants and contracts.

Excluding grants and contracts, the 1970 estimate provides for a net increase of \$1,475,154 and 24 positions for in-house activities. This increase includes:

| | |
|------------|--|
| +\$13,000 | To meet increased pay costs. |
| +1,462,154 | To support 24 additional positions and costs of special sampling and control application equipment for field investigations and demonstrations. Increased staffing is proposed as follows: |
| | Headquarters offices..... 4 |
| | Regional offices..... 6 |
| | Laboratories..... 10 |
| | Field sites..... <u>4</u> |
| | Total..... 24 |

Descriptions, plans for 1970, and the need for increases for each program are described in the sections that follow.

sites and pilot plants of facilities for example, Leavenworth and Norton, Ohio, Pomona and Firebaugh, California; Ely, Minnesota; Blue Plains, Washington, D. C.; and Norton, West Virginia.

The decrease in 1970 over 1969 of \$19,435,155 should not be construed as a designed effort to reduce the program. The effort proposed for 1968 was not accomplished as anticipated and, therefore, over \$23 million of grant and contract funds have been carried over from 1968 and are available for 1969. The 1970 estimate includes \$1,825,154 more in new obligational authority than that appropriated for 1969. Most grant and contract projects begun in 1968 and 1969 will continue into 1970. The continuation of these efforts, coupled with those projects to be initiated in 1970, will require small increases in staffing for both in-house execution of the program and the direction and coordination of existing extramural grants and contracts.

Excluding grants and contracts, the 1970 estimate provides for a net increase of \$1,793,154 and 60 positions for in-house activities. This increase includes:

| | |
|------------|--|
| +\$13,000 | To meet increased pay costs. |
| +1,780,154 | To support 60 additional positions and costs of special sampling and control application equipment for field investigations and demonstrations. Increased staffing is proposed as follows: |
| | Headquarters offices..... 4 |
| | Regional offices..... 13 |
| | Laboratories..... 30 |
| | Field sites..... <u>13</u> |
| | Total..... 60 |

Descriptions, plans for 1970, and the need for increases for each program are described in the sections that follow.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|--|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -9,364,990 | ... | \$9,844,000 | ... | Decrease in grant and contract effort. |
| (3) | <u>+187,000</u> | <u>+5</u> | 788,000 | 56 | To strengthen in-house effort to assess progress and accomplishments of the numerous grant and contract projects under way or to be under way. |
| | <u>-9,176,990</u> | <u>+5</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$12,382,091 | \$8,144,000 | -\$4,238,091 |
| Contracts..... | 6,826,899 | 1,700,000 | -5,126,899 |
| In-house..... | <u>600,000</u> | <u>788,000</u> | <u>+188,000</u> |
| Total..... | 19,808,990 | 10,632,000 | -9,176,990 |

Need for Increase

Five positions and \$187,000 are requested to permit a slight expansion of field activities for directing, coordinating and monitoring the increasing number of developmental and demonstration projects in the area of municipal pollution control. Special sampling and control application equipment (e.g., chemical feeders, controllers, tanks, mixers and aerators) are required to support the in-house field activities and are included in this increase.

Objective

The objective is to develop and demonstrate the necessary technology in the areas of storm waters, combined storm and sanitary wastes, advanced waste treatment and joint municipal-industrial treatment to achieve, at minimum cost, the most effective control of pollution from sewerage wastes, combined sewer discharges, storm sewer discharges, nonsewered runoff, nonsewered wastes, and joint (municipal-industrial) wastes.

Program of Work

Municipal-pollution control involves the development and demonstration of technology for the effective and economical control of pollution from sewerage and nonsewered wastes, combined (sanitary and storm) sewer discharges, storm sewer discharges, nonsewered runoff, and joint (municipal-industrial) wastes. Strong emphasis will continue on developing and demonstrating new and improved methods for the treatment of sewerage wastes. For nonsewered wastes, development of improved treatment devices for individual homes and isolated groups of homes or institu-

| <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | <u>Explanation</u> |
|-------------------------------------|------------------|----------------|------------------|--|
| <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | |
| (1) +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) -9,364,990 | ... | \$9,844,000 | ... | Decrease in grant and contract effort. |
| (3) +263,000 | +15 | 864,000 | 66 | To strengthen in-house effort to assess progress and accomplishments of the numerous grant and contract projects under way or to be under way. |
| <u>-9,100,990</u> | <u>+15</u> | | | |

| | <u>FY 1969</u> <u>Amount</u> <u>Available</u> | <u>FY 1970</u> <u>Estimate</u> | <u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u> |
|----------------|---|-----------------------------------|---|
| Grants..... | \$12,382,091 | \$8,144,000 | -\$4,238,091 |
| Contracts..... | 6,826,899 | 1,700,000 | -5,126,899 |
| In-house..... | <u>600,000</u> | <u>864,000</u> | <u>+264,000</u> |
| Total..... | 19,808,990 | 10,708,000 | -9,100,990 |

Need for Increase

Fifteen positions and \$263,000 are requested to permit a slight expansion of field activities for directing, coordinating and monitoring the increasing number of developmental and demonstration projects in the area of municipal pollution control. Special sampling and control application equipment (e.g., chemical feeders, controllers, tanks, mixers and aerators) are required to support the in-house field activities and are included in this increase.

Objective

The objective is to develop and demonstrate the necessary technology in the areas of storm waters, combined storm and sanitary wastes, advanced waste treatment and joint municipal-industrial treatment to achieve, at minimum cost, the most effective control of pollution from sewer discharges, combined sewer discharges, storm sewer discharges, nonsewered runoff, nonsewered wastes, and joint (municipal-industrial) wastes.

Program of Work

Municipal-pollution control involves the development and demonstration of technology for the effective and economical control of pollution from sewer and nonsewered wastes, combined (sanitary and storm) sewer discharges, storm sewer discharges, nonsewered runoff, and joint (municipal-industrial) wastes. Strong emphasis will continue on developing and demonstrating new and improved methods for

large-scale evaluation and demonstration of control technology. The Section 6 authorization will expire with 1969, though complete solutions are not expected by that time. Hence, an extension of this authorization or other funding will be necessary.

Special efforts are also being made to demonstrate the technology necessary to permit joint processing of industrial and municipal wastes for greater economy and efficiency than independent handling of these wastes can achieve. Utilizing treatment, ultimate disposal and water quality control technology developed under other subprograms, pilot- and full-scale field evaluations and demonstrations will continue.

Accomplishments

Demonstration grants have been utilized to support projects which will demonstrate control and/or treatment methods at full-scale and they, therefore, involve in-depth engineering studies and planning prior to construction of facilities. Construction has been completed or is nearing completion on several major projects which are now entering the evaluation phase. Evaluation for each project will continue for a one year period in most instances in order to gain enough operating experience and data to support conclusions relating to the applicability of the method demonstrated. The first grant project evaluations will be available beginning about July 1969.

The most recent cost estimate for separating storm waters from the existing combined storm and sanitary sewers is \$48 billion. The use of alternate control and/or treatment methods could substantially reduce this figure.

Projects now under study indicate that several alternate control and/or treatment methods appear technically and economically feasible. Indications are that the best solution for a particular problems will probably be a combination of two or more alternate methods.

Preliminary results of existing projects are being used by communities planning corrective actions. Eight special FWPCA contracts are developing corrective programs for eight communities across the United States. It is anticipated that the plans developed will serve as models for combined sewer overflow pollution abatement programs.

The following specific examples will cite projects which have resulted in positive pollution control or planning:

1. Minneapolis-St. Paul Sanitary District - Grant project

This project, now operational, is demonstrating the feasibility of a computer-assisted regulator control system for reduction of the frequency and volume of combined sewer overflows. Valuable stream water quality data is also being collected utilizing five river monitors. This may be the first step that most large communities would take in a control program.

2. Havens and Emerson - Consulting Engineers, Cleveland, Ohio-Contract project

Completion of this study through contract determined the feasibility of the use of a stabilization-retention basin to be located within Lake Erie for treatment of surface runoff, sewage treatment plant effluent, and combined sewer

Renovation of the oldest storm water overflow tanks in the United States will once again reduce pollution into the Scioto River, Columbus, Ohio, and also serve as an evaluation facility to determine tank efficacy and pollution abatement efficiency (now operational). It is anticipated that this will prove the technical and economic feasibility of overflow tanks.

4. City of Chippewa Falls, Wisconsin - Grant project

An asphalt lined storage pond is now being used to reduce pollution from combined sewer overflows into the Chippewa River. This approach will probably be used in those areas where low cost land is available.

5. City of Chicago, Illinois - Grant project

This grant is supporting a \$14.4 million deep tunnel system to store excess flow from combined sewers. The demonstration project to date has prompted the Metropolitan Sanitary District of Greater Chicago to proceed with planning for an overall deep tunnel plan for greater Chicago. Deep tunnel programs appear most feasible where land costs are high and public inconvenience is to be avoided.

6. The Western Company, Dallas, Texas - Contract project

Demonstration of the feasibility of using polymers as friction reducers to increase combined sewage flow rates has been demonstrated under this contract and will be used in another project in Cleveland, Ohio. Costly reconstruction costs associated with lack of capacity may not be necessary. Applications to other problems, such as sludge pumping also appear promising.

7. City of Cleveland, Ohio - Grant project

A crash program demonstrated how a beach area in Cleveland, Ohio, could be safely protected from combined sewer overflow pollution during the summer of 1968. Flexible barriers with hypochlorination were successfully demonstrated. This type of action has shown how stop-gap measures can be taken immediately, while long-range construction programs are being implemented.

8. American Public Works Association, Chicago, Illinois - Contract project

Completed studies under two contracts resulting in the following reports:

"Problems of Combined Sewer Facilities and Overflows-1967" gives a complete up-to-date inventory of the combined sewer problem in the United States.

"Pollutional Aspects of Urban Drainage" has established the pollution potential of urban surface runoff.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | |
|-----|-------------------------------------|------------------|----------------|------------------|---|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | <u>Explanation</u> |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -5,844,779 | ... | \$5,476,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+138,000</u> | <u>+4</u> | 839,000 | 53 | To accelerate in-house effort for developing industrial waste control programs and to monitor projects under way under the grant and contract effort. |
| | <u>-5,705,779</u> | <u>+4</u> | | | |

| | FY 1969 Amount <u>Available</u> | FY 1970 <u>Estimate</u> | Increase (+) or Decrease (-) |
|----------------|---------------------------------------|----------------------------|------------------------------------|
| Grants..... | \$11,008,959 | \$5,170,000 | -\$5,838,959 |
| Contracts..... | 311,820 | 306,000 | -5,820 |
| In-house..... | <u>700,000</u> | <u>839,000</u> | <u>+139,000</u> |
| Total..... | 12,020,779 | 6,315,000 | -5,705,779 |

Need for Increase

Four positions and \$138,000 are required to expand in-house program development in the areas of wastes from textile mills, meat processing, petrochemical, thermal pollution and lumber and logging operations, and to direct, coordinate and monitor the large number of development and demonstration projects in the industrial waste area. Also included are special sampling and control application equipment to support the in-house field activities.

Objective

The objectives are to develop and demonstrate the required technology to achieve, at minimum cost, any needed degree of pollution control from all industrial sources.

Program of Work

Industrial-pollution control technology must be developed and demonstrated to achieve effective and economical control of pollution from such industries as those producing metal and metal products, chemicals and allied products, paper and allied products, petroleum and coal products, food and kindred products, textiles, etc. In 1967 studies were initiated to identify and analyze problem areas and to establish the existing state-of-the-art in treatment and control technology in selected industries. Based on these, specific problem areas are now being attacked.

The competitive economic aspects of industrial waste control requires examination of both conventional and completely new approaches to assure minimum cost solutions. Current waste treatment methods, while often adequate for today's conditions, offer little promise of significant improvement in the future.

| <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | <u>Explanation</u> |
|-------------------------------------|------------------|----------------|------------------|---|
| <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | |
| (1) +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) -5,850,779 | ... | \$5,470,000 | ... | Reduction in grant and contract effort. |
| (3) <u>+173,000</u> | <u>+6</u> | 874,000 | 55 | To accelerate in-house effort for developing industrial waste control programs and to monitor projects under way under the grant and contract effort. |
| <u>-5,676,779</u> | <u>+6</u> | | | |

| | <u>FY 1969</u> | <u>FY 1970</u> | <u>Increase (+)</u> |
|----------------|------------------|-----------------|---------------------|
| | <u>Amount</u> | <u>Estimate</u> | <u>or</u> |
| | <u>Available</u> | | <u>Decrease (-)</u> |
| Grants..... | \$11,008,959 | \$5,170,000 | -\$5,838,959 |
| Contracts..... | 311,820 | 300,000 | -11,820 |
| In-house..... | 700,000 | 874,000 | +174,000 |
| Total..... | 12,020,779 | 6,344,000 | -5,676,779 |

Need for Increase

Six positions and \$173,000 are required to expand in-house program development in the areas of wastes from textile mills, meat processing, petrochemical, thermal pollution and lumber and logging operations, and to direct, coordinate and monitor the large number of development and demonstration projects in the industrial waste area. Also included are special sampling and control application equipment to support the in-house field activities.

Objective

The objectives are to develop and demonstrate the required technology to achieve, at minimum cost, any needed degree of pollution control from all industrial sources.

Program of Work

Industrial-pollution control technology must be developed and demonstrated to achieve effective and economical control of pollution from such industries as those producing metal and metal products, chemicals and allied products, paper and allied products, petroleum and coal products, food and kindred products, textiles, etc. In 1967 studies were initiated to identify and analyze problem areas and to establish the existing state-of-the-art in treatment and control technology in selected industries. Based on these, specific problem areas are now being attacked.

The competitive economic aspects of industrial waste control requires examination of both conventional and completely new approaches to assure minimum cost solutions. Current waste treatment methods, while often adequate for today's conditions, offer little promise of providing the time and degree of treatment

demonstrate and install treatment processes, process modifications, water conservation programs, etc. Already, research and demonstrations funded by Section 6 grants cover some industrial pollution problems from almost all major sources of industrial pollution.

Accomplishments

The citrus operation in Florida is a \$2 billion industry which produces over 75 percent of all citrus grown in the United States. Fifty-two plants discharging about 130 million gallons a day of waste, having an organic concentration amounting to 318,000 lbs. of biochemical oxygen demand daily, discharged virtually untreated into streams and lakes in Florida. The Florida State Board of Health has notified the industry to solve its pollution problem.

A grant project was initiated at Auburndale, Florida, in December 1966 with the Minute Maid Company, to develop the technology and to demonstrate the feasibility of treating a total of 13.5 million gallons a day (26,500 lbs. of biochemical oxygen demand daily and equivalent to a city of 152,500) of citrus waste waters to a degree which will result in a stable effluent discharge of low nutrient content. Plantlife (primarily water hyacinths) produced in the effluent stabilization ponds are cultivated, harvested, and combined with orange peels and sludges to produce cattle feed.

At Winter Garden, Florida, a grant project was initiated in March 1968 with the Winter Garden Citrus Products Cooperative to develop and demonstrate a tertiary treatment system to remove remaining organics and nutrients from 2 MGD of effluent using a lime precipitation process. The sludges are combined with peels and dried to produce cattle feed. The effluent is reused for in-plant processing in lieu of discharging to Lake Apopka, a model for lake rehabilitation and a beginning for solving lake eutrophication problems in Florida.

Both the above alternatives of resolving typical citrus industry waste water problems in Florida are model examples of pollution abatement for the industry to follow. The developed technology resulting will be made readily available to all others in the industry.

Large quantities of brines are used in the preparation of olives, pickles and sauerkraut. The disposal of these spent brines into unlined lagoons or into sewer systems ultimately result in ground water contamination or disruption of municipal treatment facilities.

In conjunction with the National Cannery Association, FWPCA is engaged in a grant project to establish the feasibility of reconditioning spent brines for reuse from four locations in the Central Valley of California. This pilot plant project uses a charcoal adsorption-filtration method for reconditioning the brine.

The olive products produced in California represent an annual gross value of \$30 million. An estimated 2,300 parts per million of sodium chloride is currently being discharged in some 226 million gallons of spent brine waste waters. The Central Valley Water Pollution Control Board has established discharge requirements for olive processors in the San Joaquin Valley which in essence restricts discharges from processing operations to no more than 175 parts per million of salt content. It is the desire of olive processors to keep the olive industry in a competitive position relative to foreign producers and to comply with regulations pertaining to levels of pollutants in discharge waters.

from this project will be made available to all brine consuming industries facing similar problems.

There are over 280 oil refineries in the United States, all of which produce waste chemical and oily sludges. Past practices have consisted of lagooning, open pit burning, land burial, and similar systems which ultimately result in water pollution of ground and surface waters.

A grant project with the American Oil Company at their Mandan, North Dakota, refinery is to demonstrate the feasibility of using a commercially available fluid-bed incinerator for the disposition of refinery sludges. The project was initiated in May 1968 and inquiries to date by others in the industry show a keen interest in the utilization of this technique to resolve their sludge disposal problems. Marathon Oil Company has indicated its desire to apply the method at their Robinson, Illinois, refinery. Also, the American Oil Company contemplates the use of a second, much larger, fluid-bed unit at their Whiting, Indiana, refinery in the very near future. Consequently, even though the project is not operational as yet, it is already stimulating further application of this method throughout the industry.

A grant to Armco has resulted in the construction of a facility for treating 4.6 MGD of waste oil-water emulsions from a five stand cold rolling mill. A five-chemical treatment method of coagulation, flocculation, dissolved air flotation, and sludge incineration is being used. The treatment facility was placed in operation on January 6, 1969 and a one-year study of operating parameters, costs, and effectiveness of the treatment process has been initiated.

With the pulp and paper industry, FWPCA has entered into the problem of color removal from kraft pulping effluents. Three companies are studying methods for removal and disposal of the color bodies. This problem of color contamination is considered to be one of the most important in the kraft industry today.

| | <u>Increase(+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|---|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -1,050,175 | ... | \$763,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+20,000</u> | <u>+2</u> | 621,000 | 31 | Expand in-house effort for developing programs directed toward pollution problems related to irrigation and agricultural runoff. |
| | <u>-1,029,175</u> | <u>+2</u> | | | |

| | <u>FY 1969</u> <u>Amount</u> <u>Available</u> | <u>FY 1970</u> <u>Estimate</u> | <u>Increase (+)</u> <u>or</u> <u>Decrease (-)</u> |
|----------------|---|-----------------------------------|---|
| Grants..... | \$1,493,175 | \$643,000 | -\$850,175 |
| Contracts..... | 320,000 | 120,000 | -200,000 |
| In-house..... | 600,000 | 621,000 | +21,000 |
| Total..... | 2,413,175 | 1,384,000 | -1,029,175 |

Need for Increase

An increase of two positions and \$20,000 is required to support in-house program development in irrigation return flows and agricultural runoff.

Objective

The objective of this program is to develop and demonstrate the necessary technology to allow effective and economical control of pollution from agricultural sources including (a) forestry and logging operations, (b) rural runoff, (c) irrigation return flows, (d) animal feed lots, and (e) nonsewered rural wastes.

Program of Work

Agricultural pollution requires research, development, and demonstration of technology to control and prevent pollution from sources related to agricultural activity. Major forms of pollution associated therewith are nutrients, pesticides and silt from runoff; salts and other pollutants in irrigation return flows; BOD runoff from animal feedlots; and silt and other solids from logging and forestry operations. Many of these wastes are not "collectable" and, therefore, not capable of being given waste treatment in conventional fashion. New and imaginative solutions are being sought for these problems. Of particular concern at present are the nutrients and pesticides being flushed into our streams and lakes in agricultural runoff and the tremendous loads of animal wastes discharged from a rapidly growing number of animal feedlots.

| | <u>Increase(+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|------------------------------------|------------------|--------------------------|----------------------------|--|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -1,050,175 | ... | \$763,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+40,000</u> | <u>+4</u> | 641,000 | 33 | Expand in-house effort for developing programs directed toward pollution problems related to irrigation and agricultural runoff. |
| | <u>-1,009,175</u> | <u>+4</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$1,493,175 | \$643,000 | -\$850,175 |
| Contracts..... | 320,000 | 120,000 | -200,000 |
| In-house..... | 600,000 | 641,000 | +41,000 |
| Total..... | 2,413,175 | 1,404,000 | -1,009,175 |

Need for Increase

An increase of four positions and \$40,000 is required to support in-house program development in irrigation return flows and agricultural runoff.

Objective

The objective of this program is to develop and demonstrate the necessary technology to allow effective and economical control of pollution from agricultural sources including (a) forestry and logging operations, (b) rural runoff, (c) irrigation return flows, (d) animal feed lots, and (e) nonsewered rural wastes.

Program of Work

Agricultural pollution requires research, development, and demonstration of technology to control and prevent pollution from sources related to agricultural activity. Major forms of pollution associated therewith are nutrients, pesticides and silt from runoff; salts and other pollutants in irrigation return flows; BOD runoff from animal feedlots; and silt and other solids from logging and forestry operations. Many of these wastes are not "collectable" and, therefore, not capable of being given waste treatment in conventional fashion. New and imaginative solutions are being sought for these problems. Of particular concern at present are the nutrients and pesticides being flushed into our streams and lakes in agricultural runoff and the tremendous loads of animal wastes discharged from a rapidly growing number of animal feedlots.

Forestry and logging

Work has been initiated to evaluate the quantity, character and water pollution potential of soluble substances leached from floating logs in raft storage. Leachate from log storage areas has recently been recognized as a significant source of pollution to some streams.

Rural runoff

Work is under way on investigations to determine the aspects of agricultural land runoff from confined and unconfined animal growing in well defined small watersheds.

A state-of-art report on the role of soils and sediments in water pollution control has been completed. It covers the nature and property of soils, chemical character of sewage and the behavior of nitrogen and phosphorus in soils.

Irrigation return flows

Pilot plants designed to study treatment alternatives for nitrogen removal from irrigation return flows have been placed in operation. Preliminary data has indicated high potential success using several process systems.

In a cooperative program with the Bureau of Reclamation and local irrigation districts, the first study of its kind was started to determine the quantity, fate, and persistence of herbicides applied to ditchbanks and aquatic weeds in irrigation systems.

For the first time, a study has been initiated to investigate (a) precipitation mechanisms in soils as they affect water quality, and (b) changes in the quality of irrigation water in the soil and in drainage as a result of changes in the quality of irrigation water and in irrigation management.

A definitive program has been started to determine the contributions of nitrogen and phosphorus from agricultural land under selected major land use systems, and to identify farming practices by means of which such contributions may be minimized.

Several irrigation districts in Colorado have incorporated (for the first time as a research and development venture) to line irrigation canals as a means of preventing seepage into near-surface aquifers and thereby reducing saline water discharge into the Colorado River.

Animal feed lots

Work is under way on the development of holding and spray irrigation as a means of disposal for swine wastes.

Studies devoted to evaluating an anaerobic and aerobic lagoon system for the treatment of beef cattle feed lot waste water have been completed. Results confirm that this is an effective treatment system for organic pollution reduction.

Pilot plant facilities and equipment development have been completed in a program to treat dairy feed lot runoff so as to maintain a continuous supply of

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|---|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -1,991,167 | ... | \$2,790,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+10,000</u> | <u>+1</u> | 411,000 | 23 | Expand in-house effort for developing programs in the areas of acid mine drainage and oil production pollution. |
| | <u>-1,980,167</u> | <u>+1</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$2,944,237 | \$1,910,000 | -\$1,034,237 |
| Contracts..... | 1,836,930 | 880,000 | -956,930 |
| In-house..... | 400,000 | 411,000 | +11,000 |
| Total..... | 5,181,167 | 3,201,000 | -1,980,167 |

Need for Increase

An increase of one position and \$10,000 is required to support in-house program development in acid mine drainage and oil production pollution control technology and to direct, coordinate and monitor the increasing number of development and demonstration projects in the mining wastes area.

Objective

This program has as its objective the control, alleviation or reduction of pollution from all sources included in the areas of mine drainage, oil production, uranium mining and other mining sources. As part of this program, the development of technology and the demonstration of this technology are required to obtain effective and economical control of pollution from these sources.

Program of Work

Mining pollution control technology concerns the areas of mine drainage, oil production, phosphate mining and other sources of mining pollution.

An estimated four million tons of acid from mine drainage annually discharge into more than 4,000 miles of streams. Attempts to prevent or reduce such drainage have failed due to high costs of solving the problems for which there are no immediate answers. Legislation has been proposed which will give substantial impetus to work on this problem.

Problems related to oil production are of a different nature and solutions will be sought through laboratory and field work, including pilot and field scale demonstrations. The commercial production of petroleum from the oil shale deposits in the Rocky Mountains is a potentially serious source of pollution. Substantial research and development will also be required to prevent saline and severe

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|---|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -1,991,167 | ... | \$2,790,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+50,000</u> | <u>+5</u> | 451,000 | 27 | Expand in-house effort for developing programs in the areas of acid mine drainage and oil production pollution. |
| | <u>-1,940,167</u> | <u>+5</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$2,944,237 | \$1,910,000 | -\$1,034,237 |
| Contracts..... | 1,836,930 | 880,000 | -956,930 |
| In-house..... | 400,000 | 451,000 | +51,000 |
| Total..... | 5,181,167 | 3,241,000 | -1,940,167 |

Need for Increase

An increase of five positions and \$50,000 is required to support in-house program development in acid mine drainage and oil production pollution control technology and to direct, coordinate and monitor the increasing number of development and demonstration projects in the mining wastes area.

Objective

This program has as its objective the control, alleviation or reduction of pollution from all sources included in the areas of mine drainage, oil production, uranium mining and other mining sources. As part of this program, the development of technology and the demonstration of this technology are required to obtain effective and economical control of pollution from these sources.

Program of Work

Mining pollution control technology concerns the areas of mine drainage, oil production, phosphate mining and other sources of mining pollution.

An estimated four million tons of acid from mine drainage annually discharge into more than 4,000 miles of streams. Attempts to prevent or reduce such drainage have failed due to high costs of solving the problems for which there are no immediate answers. Legislation has been proposed which will give substantial impetus to work on this problem.

Problems related to oil production are of a different nature and solutions will be sought through laboratory and field work, including pilot and field scale demonstrations. The commercial production of petroleum from the oil shale deposits in the Rocky Mountains is a potentially serious source of pollution. Substantial

Stream pollution from mining operations is a serious problem in the United States. Annually, approximately 500 billion gallons of mine drainage, containing five to ten million tons of acid, pollute over 10,000 miles of surface streams and more than 15,000 acres of impounded waters. Cost estimates to reduce pollution from mine drainage by 95 percent are \$6 to \$7 billion. To find solutions to the complex mine drainage problem and reduce costs, FWPCA has initiated a broad research program, including in-house research and support of research and development by industry, universities, State governments, and research firms.

During 1969, work was completed at the mine drainage demonstration project near Elkins, West Virginia. Surface mine reclamation, mine sealing, and water diversion were the control measures constructed to obtain positive prevention of acid mine drainage. Twelve miles of surface mines were reclaimed, and 450 mine subsidence holes filled and 45 mine seals built to prevent air and water from entering underground mines. The acid load to the stream has been reduced approximately 35 percent and is continuing to decrease. The land disturbed during reclamation was revegetated with grass and trees to control erosion and thus prevent further pollution from silt and acidity.

Because of the uncertainty and only partial applicability of at source control or prevention techniques such as sealing and water diversion, for the total control of acid mine drainage, treatment research and development has been a number one priority effort for the first time in the history of the mine drainage water pollution control program. Lime and limestone neutralization of acid mine drainage, for example, is a treatment process which is being used extensively by industry and others for pollution control, primarily in the State of Pennsylvania.

The mine drainage treatment research facility at Norton, West Virginia, has continued investigations on electrodialysis and reverse osmosis unit processes, and it is currently initiating programs related to brine disposal and treatment, and sludge disposal and sludge recycle in a continuing attempt to develop operating parameters and to define and wherever possible reduce the costs associated with the full-scale application of treatment technology.

During the past year, the extramural grant and contract program has been designed to strike a balance between the development of advanced prevention technology and the development of treatment processes and techniques with an overall total objective of producing water of very high quality for reuse in industry and municipalities throughout the Nation where mine drainage problems exist. This program currently has over 20 active projects totalling almost \$4 million. The significance of this program is that a wide variety of techniques will be available to provide a range of control alternatives which will be between 30 and 95 percent efficient in controlling the total problem. At this point, the total national abatement program can move ahead in full gear with significant cost reductions over what would have been otherwise possible, of between 10 and 30 percent. Also, with the implementation of the treatment research and development program, it will be possible for the first time to implement a total national effort with control potentials of greater than 95 percent.

| | Increase (+) or Decrease (-) | | Total Program | Total Positions | Explanation |
|-----|------------------------------|-----------|------------------|--------------------|---|
| | Amount | Positions | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -616,330 | ... | \$2,888,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+143,154</u> | <u>+3</u> | 444,000 | 24 | To expand in-house effort on water quality changes and control and oil pollution. |
| | <u>-472,176</u> | <u>+3</u> | | | |

| | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) or Decrease (-) |
|----------------|--------------------------------|---------------------|------------------------------------|
| Grants..... | \$1,364,330 | \$1,300,000 | -\$64,330 |
| Contracts..... | 2,140,000 | 1,588,000 | -552,000 |
| In-house..... | 299,846 | 444,000 | +144,154 |
| Total..... | 3,804,176 | 3,332,000 | -472,176 |

Need for Increase

An increase of three positions and \$143,154 is required to support in-house research in water quality changes and water quality control in impoundments and in oil pollution. Also included in the increase are special sampling and control application equipment in support of the oil pollution studies conducted out of the Edison, New Jersey facility.

Objective

The objective of this program is to develop and demonstrate the necessary technology to allow effective and economical control of pollution from sources such as: (a) recreational, (b) boats and ships, (c) construction projects, (d) impoundments, (e) salt water intrusion, (f) natural pollution, (g) dredging and landfill, and (h) oil pollution.

Program of Work

Other sources of pollution are also significant and require development and demonstration of technology for their effective and economical control. These sources include recreational boats and commercial vessels, construction projects, impoundments, saltwater intrusion, natural pollution, dredging and landfill operations, and the whole area referred to as "oil pollution."

Increasing amounts of wastes are discharged from the ever-growing number of recreational and commercial vessels which ply our waters, both inland and coastal. Suitable on-board equipment for properly treating vessel wastes before discharge is not fully developed. Generally, on-board sewage treatment units are bulky and heavy, or only minimally effective. Further research, development, testing and evaluation are urgently needed to deal more effectively with these problems.

Construction activities that affect the quality of water relate to housing developments, roads, railroads, power transmission lines, dams, etc. The polluting substances likely to enter streams during and after construction include silt

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|----------------|-------------------------------------|------------------|---|-----------------------------|---|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -664,330 | ... | \$2,840,000 | ... | Reduction in grant and contract effort. |
| (3) | <u>+143,154</u> | <u>+3</u> | 444,000 | 24 | To expand in-house effort on water quality changes and control and oil pollution. |
| | <u>-520,176</u> | <u>+3</u> | | | |
| | | | | | |
| | | | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
| Grants..... | | | \$1,364,330 | \$1,300,000 | -\$64,330 |
| Contracts..... | | | 2,140,000 | 1,540,000 | -600,000 |
| In-house..... | | | 299,846 | 444,000 | +144,154 |
| Total..... | | | 3,804,176 | 3,284,000 | -520,176 |

Need for Increase

An increase of three positions and \$143,154 is required to support in-house research in water quality changes and water quality control in impoundments and in oil pollution. Also included in the increase are special sampling and control application equipment in support of the oil pollution studies conducted out of the Edison, New Jersey facility.

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Program of Work

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Increasing amounts of wastes are discharged from the ever-growing number of recreational and commercial vessels which ply our waters, both inland and coastal. Suitable on-board equipment for properly treating vessel wastes before discharge is not fully developed. Generally, on-board sewage treatment units are bulky and heavy, or only minimally effective. Further research, development, testing and evaluation are urgently needed to deal more effectively with these problems.

Construction activities that affect the quality of water relate to housing developments, roads, railroads, power transmission lines, dams, etc. The polluting

recharging the aquifers with renovated waste water.

Water impounded in reservoirs can be used to alleviate pollution through flow augmentation. Unfortunately, the storage of water in reservoirs can adversely affect its quality. Thermal stratification can occur, leading to chemical stratification as well. New techniques are being researched to accomplish artificial destratification of impoundments to alleviate these problems.

The complexity and extent of diffuse sources of pollution require a concentrated in-house effort through both laboratory and field projects. Both short-term and long-term solutions for the important problems of pollution from dredging operations and oil pollution are urgently needed.

Accomplishments

Recreation

A contract was initiated to demonstrate the use of advanced waste treatment to control pollution from recreational sources at the Pikes Peak National Park. The present treatment processes are extremely wasteful of water and ever increasing numbers of tourists would aggravate an already undesirable situation. The new treatment process will allow a high quality water to be recovered from present wastes and this water will be used for all nonpotable uses at the Park.

A project was carried out to renovate a section of polluted beach at Stamford, Connecticut, using a pneumatic barrier. This method could potentially find use at many locations for the purpose of preventing and abating pollution at beach areas. The method involves the use of porous tubes on the bottom of the river, closing off a segment of the beach. Air is pumped into the tube and thus to the water, effectively isolating the beach from gross contamination by floating debris and waste products. Partial control of dissolved organic materials and coliform bacteria have been demonstrated by this method.

Wastes from watercraft

Negotiations are under way to initiate several small contracts which will result in demonstration projects concerning the feasibility of various control and/or treatment concepts for wastes generated on board vessels. Almost all of the eight million boats on the Nation's waterways, both large and small, are sources of wastes, each requiring a different approach for the greatest pollution control benefits at the lowest costs. No discharge (holding tanks on board) would conceivably provide the greatest benefits at a modest cost for smaller craft. Treatment methods would probably be most advantageous for larger vessels. These planned projects are to confirm or refute this hypothesis and allow us to project costs for large scale, future programs.

Oil pollution

Two projects were undertaken to develop and demonstrate the use of devices to contain and clean up spilled oil in busy harbors.

Work is under way at Portland, Maine, to demonstrate the use of pneumatic booms for oil containment still permitting unrestricted ship navigation. The use of mechanical booms and oil clean up devices will also be demonstrated.

developed.

Negotiations are essentially completed on four contracts totalling about a half million dollars which should significantly advance the state of oil spill pollution control technology. Work to be done under the contracts will develop methods to convert tanker cargos into a semi-solid state effectively preventing loss in the event of an accident, to detect the source of clandestine oil spills, and to clean up spilled oil.

Work carried out at FWPCA laboratories has produced an instruction manual for coping with spills of many hazardous chemicals.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|--|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -211,613 | ... | \$5,671,000 | ... | Reduction in grant effort. |
| (3) | <u>+648,000</u> | <u>+2</u> | 3,322,000 | 129 | To expand in-house effort in laboratories in water quality control, coastal and groundwater pollution and eutrophication, and to support a cooperative effort with TVA in thermal pollution. |
| | <u>+441,387</u> | <u>+2</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$4,342,613 | \$4,032,000 | -\$310,613 |
| Contracts..... | 1,540,000 | 1,639,000 | +99,000 |
| In-house..... | <u>2,669,000</u> | <u>3,322,000</u> | <u>+653,000</u> |
| Total..... | 8,551,613 | 8,993,000 | +441,387 |

Need for Increase

An increase of two positions and \$148,000 is required to expand laboratory research in the areas of eutrophication (aging of lakes, streams and coastal waters), water quality control, and coastal and groundwater pollution. Included in this increase are special sampling and control application equipment required to support the in-house field work such as the eutrophication studies being conducted at Ely, Minnesota. Also included is an increase of \$500,000 to support a cooperative effort with TVA on thermal pollution (temperature effects on fresh water fish).

Objective

Effort in this category includes research, development and demonstration aimed at prevention and control of accelerated eutrophication of lakes, streams, and estuaries; at control of pollution by means other than waste treatment; at socioeconomic, legal and institutional aspects of pollution; at assessment and control of pollution in extreme cold climate areas; at identification, source and fate technology of a generally applicable nature across a variety of pollution sources; at prevention and control of thermal pollution; and at long-range solutions to pollution problems (basic research).

Program of Work

Water quality control includes all research, development and demonstration directed toward the prevention and control of accelerated eutrophication; thermal pollution; the control of pollution by means other than waste treatment; the socioeconomic, legal and institutional aspects of pollution; the assessment and control of pollution in extremely cold climates; and the identification, source and fate technology of a generally applicable nature across a variety of pollution sources.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|--|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | -310,613 | ... | \$4,032,000 | ... | Reduction in grant effort. |
| (3) | <u>+704,000</u> | <u>+9</u> | 3,378,000 | 136 | To expand in-house effort in laboratories and at field sites in water quality control, coastal and ground-water pollution and eutrophication, and to support a cooperative effort with TVA in thermal pollution. |
| | <u>+398,387</u> | <u>+9</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$4,342,613 | \$4,032,000 | -\$310,613 |
| Contracts..... | 1,540,000 | 1,540,000 | ... |
| In-house..... | 2,669,000 | 3,378,000 | +709,000 |
| Total..... | 8,551,613 | 8,950,000 | +398,387 |

Need for Increase

An increase of nine positions and \$204,000 is required to expand laboratory and field site research in the areas of eutrophication (aging of lakes, streams and coastal waters), water quality control, and coastal and groundwater pollution. Included in this increase are special sampling and control application equipment required to support the in-house field work such as the eutrophication studies being conducted at Ely, Minnesota. Also included is an increase of \$500,000 to support a cooperative effort with TVA on thermal pollution (temperature effects on fresh water fish).

Objective

Effort in this category includes research, development and demonstration aimed at prevention and control of accelerated eutrophication of lakes, streams, and estuaries; at control of pollution by means other than waste treatment; at socioeconomic, legal and institutional aspects of pollution; at assessment and control of pollution in extreme cold climate areas; at identification, source and fate technology of a generally applicable nature across a variety of pollution sources; at prevention and control of thermal pollution; and at long-range solutions to pollution problems (basic research).

Program of Work

Water quality control includes all research, development and demonstration directed toward the prevention and control of accelerated eutrophication; thermal pollution; the control of pollution by means other than waste treatment; the socioeconomic, legal and institutional aspects of pollution; the assessment and control

not well understood. Controlling it calls for study of the biology and chemistry of the aquatic environment, more complete analytical data on nitrogen and phosphorus compounds, and research on new and improved methods for nutrient removal in waste treatment, including pilot plant studies and field evaluations.

Development of water quality control technology will become of major and increasing importance as the pollution control payoff from waste treatment becomes increasingly marginal. Water quality control methods include the so-called at source controls as well as such concepts as synthesis, diversion, dispersion, dilution and environmental treatment. Exploration of new techniques in these categories began in 1968; the promising ones must be moved into pilot-scale and field studies in 1970 and 1971 as the exploratory work continues.

Mathematical models need to be evolved to relate pollution levels to the broad range of effects expressed in social and economic values. Research applicable to multiple sources of pollution must be expanded. This includes identification and characterization of pollutants, methodology for detecting and quantifying pollution sources, and for determining the fate of pollutants as they move through the water environment, all essential to effective pollution control.

Accomplishments

Eutrophication

1. A pilot plant is being operated at Ely, Minnesota to determine if removal of algal nutrients from municipal sewage is an effective means for control of algal production in lakes.

2. Determined how to control growths of nuisance algae in the laboratory by use of algal viruses and brought this control technique to pilot plant stage via contract with Syracuse University.

3. Cooperation with the Joint Industry-Government Task Force on Eutrophication whose charge it is to stimulate means for the control of man-induced eutrophication in the United States.

4. Determining the relationship between sediment and overlying water so as to prevent multiple recycling of nutrients through successive generations of algae and other aquatic plants.

Physical-chemical identification of pollutants

1. Direct measurements of dissolved oxygen profiles in a flowing stream--attached bacterial slime system where made using newly developed micro-dissolved oxygen probe. Report is being published.

Biological identification of pollutants

1. Developed a provisional algal assay procedure to evaluate the potential of water and waste water for algal growth; cooperating with three universities to develop this procedure to the stage where it will become a standard procedure.

2. A continuous-flow bottom-respirometer for measuring the respiration on stream bottoms was developed and field tested.

2. A method to resolve soluble protein from fish brain by electrophoresis has been developed allowing further studies on metabolism of pollutants by brain tissue.

Fate of pollutants in ground waters

1. Studies were completed and published, "Fate of DDT and Nitrate in Ground Water." This was a joint venture between FWPCA and U.S. Department of Agriculture.

2. Studies concerning the behavior and fate of pollutants in the Ogallala Aquifer were presented at a Soil Conservation Service Technical Workshop, Texas A&M.

3. Groundwater research using radio-tracers solved the five-year Estelline Spring problem relating to natural brine pollution. This was accomplished in cooperation with U.S. Army Corps of Engineers.

Fate of pollutants in coastal waters

1. Initiated work on a method for computing the mixing and spread of pollutants from outfall pipes and barge dumps.

2. Published index to research on coastal and estuarine waters in the United States and an annotated bibliography, "Environmental Factors in Coastal and Estuarine Waters, Coast of Washington."

3. Initiated work on determining pollutional aspects of tide flats and bottom deposits and the impact of dredging operations.

4. A special report was prepared on the coastal pollution considerations associated with a proposed program of disposal of solid aluminum process wastes by barging to the ocean.

Water resources planning and resources data

1. Several significant accomplishments were made in developing new techniques for planning, designing, and managing pollution control systems. Studies showed that properly designed and operated regional pollution control systems can reduce pollution control costs to 50 percent or less of that required for individual waste control facilities. Improved methods for designing and operating these regional systems in an optimum manner using computer and systems analysis techniques were developed. Two demonstration grants were initiated to demonstrate on a full scale the rapid acquisition of processing of large quantities of water quality data from many monitoring stations to assist pollution control managers in operating water quality control systems and executing and enforcing basin- or State-wide pollution control programs.

Thermal pollution

1. Initiated work on a method for temperature prediction in Columbia River due to thermal wastes and power dam operations.

2. The establishment of a Thermal Pollution Research Program at the Pacific Northwest Water Laboratory at Corvallis, Oregon and the publication of an Industrial Waste Guide on Thermal Pollution directed to the practicing engineer

3. Technical Seminars and National Symposia on Thermal Pollution Control have been held to expedite technology transfer to operating personnel of FWPCA, the States, research institutes, and individuals.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|--------------------------|----------------------------|---|
| | <u>Amount</u> | <u>Positions</u> | | | |
| (1) | -\$1,882,101 | ... | \$4,083,000 | ... | Reduction in grant and contract effort. |
| (2) | +137,000 | +2 | 2,637,000 | 128 | To expand in-house effort in laboratories in treatment and disposal technology. |
| | <u>-1,745,101</u> | <u>+2</u> | | | |

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-)</u> |
|----------------|---|-----------------------------|---|
| Grants..... | \$3,001,531 | \$1,969,000 | -\$1,032,531 |
| Contracts..... | 2,963,570 | 2,114,000 | -849,570 |
| In-house..... | 2,500,000 | 2,637,000 | +137,000 |
| Total..... | 8,465,101 | 6,720,000 | -1,745,101 |

Need for Increase

Two positions and \$137,000 are required in order to expand laboratory effort in treatment and control research, physical-chemical treatment research, biological treatment research, and particularly ultimate disposal research. Included in this increase are special sampling and control application equipment required to support the pilot plant studies being carried out at such facilities as Pomona, California; Blue Plains, Washington, D.C.; and Lebanon, Ohio.

Objective

The objectives of this research are to develop generally applicable waste treatment and ultimate disposal technology to achieve any desired degree of treatment of point sources of pollution and to develop and demonstrate technology capable of returning municipal, industrial, and agricultural waste waters to qualities suitable for direct reuse. Improved techniques must be made available for separation and disposal of (a) dissolved nutrients, (b) dissolved refractory organics, (c) suspended and colloidal solids, (d) dissolved inorganics, (e) dissolved biodegradable organics, and (f) microorganisms.

Program of Work

Waste treatment and ultimate disposal technology covers research, development and demonstration of treatment technology for pollution control and for the renovation of waste waters for reuse. Work in the laboratory has shown that it is technically possible to achieve any degree of waste treatment desired and, in fact, to return waste water to a quality at least as high as it was before use. However, considerable work remains to be done to achieve these degrees of treatment at any necessary location, under any conditions, and at minimum cost. Much of the overall FWPCA research effort is directed toward the development of completely new advanced waste treatment processes.

Because research findings have exceeded expectations, an accelerated program has been undertaken with increased assurance of both short- and long-term payoffs

| <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | <u>Explanation</u> | |
|-------------------------------------|-------------------|------------------|------------------|--------------------|--|
| <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | | |
| (1) | -\$1,996,101 | ... | \$3,969,000 | ... | Reduction in grant and contract effort. |
| (2) | <u>+164,000</u> | <u>+5</u> | 2,664,000 | 131 | To expand in-house effort in laboratories and at field sites in treatment and disposal technology. |
| | <u>-1,832,101</u> | <u>+5</u> | | | |
| | | | | | |
| | | <u>FY 1969</u> | | | <u>Increase (+)</u> |
| | | <u>Amount</u> | | <u>FY 1970</u> | <u>or</u> |
| | | <u>Available</u> | | <u>Estimate</u> | <u>Decrease (-)</u> |
| Grants..... | | \$3,001,531 | | \$1,969,000 | -\$1,032,531 |
| Contracts..... | | 2,963,570 | | 2,000,000 | -963,570 |
| In-house..... | | 2,500,000 | | 2,664,000 | +164,000 |
| Total..... | | 8,465,101 | | 6,633,000 | -1,832,101 |

Need for Increase

Five positions and \$164,000 are required in order to expand laboratory and field effort in treatment and control research, physical-chemical treatment research, biological treatment research, and particularly ultimate disposal research. Included in this increase are special sampling and control application equipment required to support the pilot plant studies being carried out at such facilities as Pomona, California; Blue Plains, Washington, D. C.; and Lebanon, Ohio.

Objective

The objectives of this research are to develop generally applicable waste treatment and ultimate disposal technology to achieve any desired degree of treatment of point sources of pollution and to develop and demonstrate technology capable of returning municipal, industrial, and agricultural waste waters to qualities suitable for direct reuse. Improved techniques must be made available for separation and disposal of (a) dissolved nutrients, (b) dissolved refractory organics, (c) suspended and colloidal solids, (d) dissolved inorganics, (e) dissolved biodegradable organics, and (f) microorganisms.

Program of Work

Waste treatment and ultimate disposal technology covers research, development and demonstration of treatment technology for pollution control and for the renovation of waste waters for reuse. Work in the laboratory has shown that it is technically possible to achieve any degree of waste treatment desired and, in fact, to return waste water to a quality at least as high as it was before use. However, considerable work remains to be done to achieve these degrees of treatment at any necessary location, under any conditions, and at minimum cost. Much of the overall FWPCA research effort is directed toward the development of completely new advanced waste treatment processes.

Because research findings have exceeded expectations, an accelerated program has been undertaken with increased assurance of both short- and long-term payoffs.

Complete treatment of all waste streams and ultimate disposal of waste concentrates (both municipal and industrial) can be developed, field-evaluated and demonstrated by the mid-1970's.

Accomplishments

Dissolved nutrient removal

1. Full-scale studies have shown digester supernatant can be lime treated to remove 95 percent of the phosphorus and 50 percent of the chemical oxygen demand. The sludge drains well on sand beds.
2. A special ion exchange zeolite has been demonstrated on a pilot plant scale to concentrate and remove ammonia from waste water.
3. Rapid and complete removal of the nitrate ion has been accomplished in beds of granular media when adding an organic substrate (methanol).
4. Carbon dioxide and lime have been used successfully in a single-stage clarification, phosphate removal process. This configuration has the low capital cost of a single stage system and the low chemical cost of a two stage clarification process.
5. Significant phosphate removal has been accomplished on a large scale by the addition of alum to the aerator of an activated sludge plant.

Dissolved refractory organics removal

1. Demonstrated that an expanded bed of granular carbon is essentially free of pressure drop problems which occur in packed beds; this development has the potential for significantly decreasing the cost of carbon treatment.
2. A revised granular carbon thermal regeneration procedure has been developed that will improve regeneration efficiency and reduce physical losses.
3. The microstrainer and sand filtration processes for removal of suspended solids have proven effective in reducing the biochemical oxygen demand and suspended solids content of a secondary effluent to less than five parts per million.

Suspended and colloidal solids removal

1. Cationic polymers were shown in laboratory studies to be effective flocculants for some raw sewages. A colloid titration technique was developed to rapidly select the dosage range of polymer.
2. Dissolved air flotation has been proven effective on a one million gallon a day scale for removing solids from a mixed liquor. A sludge of 4 to 4-1/2 percent solids can be easily obtained.

Dissolved inorganics removal

It has been demonstrated that hyperfiltration membranes formed dynamically from components for secondary sewage on suitable porous supports are capable of significant organic and inorganic removal at fluxes much higher than those possible with synthetic membranes.

coagulation and desimentation, can be successfully treated in an activated sludge system. Based on these studies a full-scale plant is being constructed.

2. Demonstrated the effectiveness of U-tube aeration for pretreatment in the sewer system and post treatment prior to discharge.

3. Demonstrated the feasibility of joint treatment of municipal and industrial pulp paper mill wastes using the Kravs activated sludge process.

4. Demonstrated on a pilot scale the superiority of trickling filter-activated sludge sequential treatment over activated sludge-trickling filter sequence.

Ultimate disposal

1. Lime that has been used for phosphate removal can be recovered and reused for at least four cycles. The excess of phosphate can be recovered as low grade phosphate rock with possible salvage value.

2. Alumina sludges containing phosphates can be treated with lime which improves dewatering and recovers some of the aluminum as soluble aluminates which may be reused.

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | | <u>Explanation</u> |
|----------------|-------------------------------------|------------------|--------------------------------|---------------------|--|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | |
| (1) | +\$3,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +179,000 | +5 | \$2,610,000 | 128 | To expand in-house effort on effects of pollution on salt and fresh water. |
| (3) | <u>+51,000</u> | <u>...</u> | 775,000 | ... | Increase in contract effort. |
| | <u>+233,000</u> | <u>+5</u> | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) or Decrease (-) |
| Grants..... | | | \$1,532,000 | \$1,532,000 | ... |
| Contracts..... | | | 724,000 | 775,000 | +\$51,000 |
| In-house..... | | | 2,428,000 | 2,610,000 | +182,000 |
| Total..... | | | 4,684,000 | 4,917,000 | +233,000 |

Need for Increase

Five positions and \$179,000 are needed to increase the staffing of the Water Quality Laboratory, Duluth, Minnesota and the temporary Marine Water Quality Laboratory, Narragansett, Rhode Island. Special sampling equipment in support of the Newtown, Ohio field site is included in this increase. There is also included a slight increase in contract effort on effects of pollution.

Objective

The objective is to provide the scientific bases for the establishment of water quality standards for the Nation's waters. These standards relate to use of fresh and marine water for municipal, agricultural, industrial and recreational purposes and for propagation of fish, other aquatic life and wildlife.

Program of Work

Water quality requirements research is needed on the effects of pollution to provide an improved scientific basis for determining the water quality necessary for municipal, industrial, agricultural, and recreational uses, and for the propagation of fish and other aquatic life. This information is essential to the establishment and refinement of the Nation's water quality standards. Because of the tremendous number of new chemical compounds being synthesized and finding their way into our environment each year, intensive research investigations must be conducted to develop a predictive capability allowing us to project the potential pollutional impact of these compounds in advance.

Far too little is known about the effects of pollution. The drastic effects (e.g., the massive fish kill) can be easily recognized, but quite often the true cause of such events cannot be defined even in extensive retrospect. To look ahead and to predict the occurrence of such events is, unfortunately, well beyond our current capability for any but the simplest stream system under the least complicated set of environmental conditions and pollution loads. There is also the challenge of detecting, understanding, and then preventing the more subtle, long-term effects of pollution which could, even now, be robbing us of valuable water resources. Such effects, as yet unknown, may be just as real as the sudden fish kill, the unpalatable water supply, or the condemned bathing beach.

| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | <u>Explanation</u> |
|----------------|-----------------|------------------|--------------------------------|---------------------|--|
| (1) | +\$3,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+243,000</u> | <u>+13</u> | \$2,674,000 | 136 | To expand in-house effort on effects of pollution on salt and fresh water. |
| | <u>+246,000</u> | <u>+13</u> | | | |
| | | | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) or Decrease (-) |
| Grants..... | | | \$1,532,000 | \$1,532,000 | ... |
| Contracts..... | | | 724,000 | 724,000 | ... |
| In-house..... | | | 2,428,000 | 2,674,000 | +\$246,000 |
| Total..... | | | 4,684,000 | 4,930,000 | +246,000 |

Need for Increase

Thirteen positions and \$243,000 are needed to increase the staffing of the Water Quality Laboratory, Duluth, Minnesota; the temporary Marine Water Quality Laboratory, Narragansett, Rhode Island; and to permit a slight expansion in technical staffing at the Newtown, Ohio, field site. Special sampling equipment in support of the Newtown field site is included in this increase.

Objective

The objective is to provide the scientific bases for the establishment of water quality standards for the Nation's waters. These standards relate to use of fresh and marine water for municipal, agricultural, industrial and recreational purposes and for propagation of fish, other aquatic life and wildlife.

Program of Work

Water quality requirements research is needed on the effects of pollution to provide an improved scientific basis for determining the water quality necessary for municipal, industrial, agricultural, and recreational uses, and for the propagation of fish and other aquatic life. This information is essential to the establishment and refinement of the Nation's water quality standards. Because of the tremendous number of new chemical compounds being synthesized and finding their way into our environment each year, intensive research investigations must be conducted to develop a predictive capability allowing us to project the potential pollutional impact of these compounds in advance.

Far too little is known about the effects of pollution. The drastic effects (e.g., the massive fish kill) can be easily recognized, but quite often the true cause of such events cannot be defined even in extensive retrospect. To look ahead and to predict the occurrence of such events is, unfortunately, well beyond our current capability for any but the simplest stream system under the least complicated set of environmental conditions and pollution loads. There is also the challenge of detecting, understanding, and then preventing the more subtle, long-term effects of pollution which could, even now, be robbing us of valuable water resources. Such effects, as yet unknown, may be just as real as the sudden fish kill, the unpalatable water supply, or the condemned bathing beach.

at Newtown, Ohio, will contribute to this effort. This in-house effort must be supplemented with contracts and grants to obtain the service of highly specialized and often uniquely qualified investigators.

Accomplishments

Fish and other aquatic life

1. A comprehensive research effort to develop sound information upon which to base temperature standards is under way, including the completion of a temporary field site at a power plant. Significant information on temperature tolerance of important fishes such as trout, perch and suckers has been obtained.
2. An intensive investigation of taconite discharge in Lake Superior was completed. Through diffraction techniques, a method to adequately trace the taconite waste in Lake Superior was found.
3. "Green waters" reported to be caused by the discharge of taconite into Lake superior was physically and chemically defined and found to result from the discharge.
4. A standard testing section to determine safe concentration of industrial waste in natural waters has been developed and shows promise as a valid way to establish standards for such discharges. If it is found adequate, the determination of safe levels of wastes will be quicker and less costly than now anticipated.
5. Initiating and carrying out research on invertebrates and fishes for determination of sublethal effects of toxicants including pathological, histopathological, biochemical, biophysical, and hematological aspects.
6. Development of local sources of fish and invertebrates for experimental use.
7. Initiation of ecological studies.
8. Initiation of dissolved oxygen and temperature requirements and the determination of the effect of holding on experimental animals.
9. Establishment of six species of calanoid crustaceans (copepods) in reliable laboratory culture and development of mass culture methods for zooplankton in synthetic seawater.
10. Development of synthetic seawater formulation that will support luxuriant growth of 86 species of phytoplankton and six species of zooplankton.
11. Determination of nitrogen, phosphorous, and sulfur requirements of Skeletonema costatum, predominant diatom in temperate inshore water.
12. Development of rapid, reliable, and informative growth bioassay for phytoplankton using carbon-14 labelled carbon dioxide fixation and particle sizing technique.
13. Selected a group of sensitive and ecologically important algae as test organisms.
14. Developed a technique of filter sterilization for media and raw seawater

defining research needs for municipal raw water supplies and for recreational water uses have been developed. Important progress has been achieved in focusing university efforts on selected important research areas through projects.

Research, Development and Demonstration Program
Bridge between Program Elements and Conventional Budget Basis
FY 1969 and 1970

| | Municipal- Pollution Control Technology | | Industrial- Pollution Control Technology | | Agricultural- Pollution Control Technology | | Mining- Pollution Control Technology | | Other-Sources- of-Pollution Control Technology | | Water Quality Control Technology | | Waste Treatment and Ultimate Disposal Technology | | Water Quality Requirements Research | | Tot |
|---------------------------|--|---------|---|---------|---|-------|---|---------|---|---------|---|---------|---|---------|--|---------|------------|
| | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 |
| Sewer | \$11,166 | \$5,700 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | \$11,166a/ |
| ..... | 6,939 | 4,400 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6,939 |
| ts..... | 4,227 | 1,300 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4,227 |
| Waste t and eatment | 7,899 | 4,000 | ... | ... | \$700 | ... | \$300 | ... | ... | ... | ... | ... | \$2,896 | \$900 | ... | ... | 11,794 |
| ..... | 5,299 | 3,600 | ... | ... | 500 | ... | ... | ... | ... | ... | ... | ... | 1,533 | 500 | ... | ... | 7,331b/ |
| s..... | 2,600 | 400 | ... | ... | 200 | ... | 300 | ... | ... | ... | ... | ... | 1,363 | 400 | ... | ... | 4,463a/ |
| l Waste | ... | ... | \$10,753 | \$4,902 | 470 | \$120 | 4,371 | \$2,680 | \$2,202 | \$1,538 | \$471 | \$160 | ... | ... | ... | ... | 18,267 |
| ..... | ... | ... | 10,541 | 4,702 | 350 | ... | 2,834 | 1,800 | 762 | 698 | 311 | ... | ... | ... | ... | ... | 14,798c/ |
| s..... | ... | ... | 212 | 200 | 120 | 120 | 1,537 | 880 | 1,440 | 840 | 160 | 160 | ... | ... | ... | ... | 3,469a/ |
| tion | 16 | 16 | 133 | 133 | 250 | 250 | ... | ... | 420 | 420 | 1,339 | 1,339 | 331 | 331 | \$11 | \$11 | 2,500 |
| Grants | 128 | 128 | 335 | 335 | 393 | 393 | 110 | 110 | 182 | 182 | 2,693 | 2,693 | 1,138 | 1,138 | 1,521 | 1,521 | 6,500 |
| research | ... | ... | 100 | 106 | ... | ... | ... | ... | 700 | 748 | 1,380 | 1,479 | 1,600 | 1,714 | 724 | 775 | 4,504 |
| ts | 600 | 788 | 700 | 839 | 600 | 621 | 400 | 411 | 300 | 444 | 2,669 | 3,322 | 2,500 | 2,637 | 2,428 | 2,610 | 10,197 |
| ..... | 19,809 | 10,632 | 12,021 | 6,315 | 2,413 | 1,384 | 5,181 | 3,201 | 3,804 | 3,332 | 8,552 | 8,993 | 8,465 | 6,720 | 4,684 | 4,917 | 64,929 |
| ..... | (12,382) | (8,144) | (11,009) | (5,170) | (1,493) | (643) | (2,944) | (1,910) | (1,364) | (1,300) | (4,343) | (4,032) | (3,002) | (1,969) | (1,532) | (1,532) | (38,069) |
| ..... | (6,827) | (1,700) | (312) | (306) | (320) | (120) | (1,837) | (880) | (2,140) | (1,588) | (1,540) | (1,639) | (2,963) | (2,114) | (724) | (775) | (16,663) |
| ..... | (600) | (788) | (700) | (839) | (600) | (621) | (400) | (411) | (300) | (444) | (2,669) | (3,322) | (2,500) | (2,637) | (2,428) | (2,610) | (10,197) |

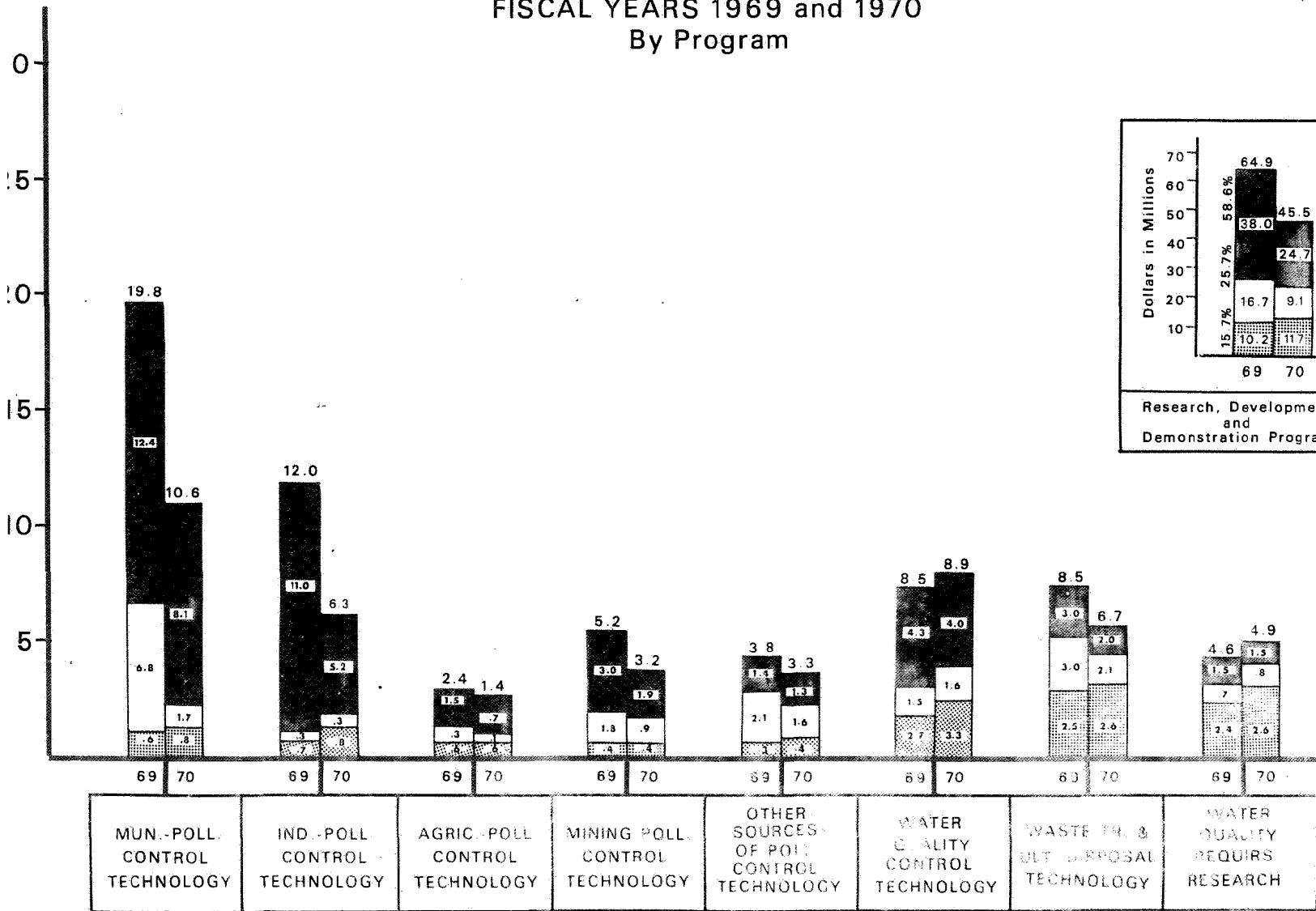
able to authorization under section 6(e)(1) under the Federal Water Pollution Control Act, as amended, and available until expended.
able to authorization under section 6(e)(2) under the Federal Water Pollution Control Act, as amended, and available until expended.
able to authorization under section 6(e)(3) under the Federal Water Pollution Control Act, as amended, and available until expended.

Research, Development and Demonstration Program
Bridge between Program Elements and Conventional Budget Basis
FY 1969 and 1970

| | Municipal- Pollution Control Technology | | Industrial- Pollution Control Technology | | Agricultural- Pollution Control Technology | | Mining- Pollution Control Technology | | Other-Sources- of-Pollution Control Technology | | Water Quality Control Technology | | Waste Treatment and Ultimate Disposal Technology | | Water Quality Requirements Research | | |
|-------------------------------|--|---------|---|---------|---|-------|---|---------|---|---------|---|---------|---|---------|--|---------|----------|
| | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 | 1970 | 1969 |
| Sewer | \$11,166 | \$5,700 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | \$11,166 |
| ..... | 6,939 | 4,400 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6,939 |
| cts..... | 4,227 | 1,300 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4,227 |
| Waste ent and Treatment | 7,899 | 4,000 | ... | ... | \$700 | ... | \$300 | ... | ... | ... | ... | ... | \$2,896 | \$900 | ... | ... | 11,795 |
| ..... | 5,299 | 3,600 | ... | ... | 500 | ... | ... | ... | ... | ... | ... | ... | 1,533 | 500 | ... | ... | 7,332 |
| cts..... | 2,600 | 400 | ... | ... | 200 | ... | 300 | ... | ... | ... | ... | ... | 1,363 | 400 | ... | ... | 4,463 |
| al Waste | ... | ... | 10,753 | \$4,902 | 470 | \$120 | 4,371 | \$2,630 | \$2,202 | \$1,538 | \$471 | \$160 | ... | ... | ... | ... | 18,265 |
| ..... | ... | ... | 10,541 | 4,702 | 350 | ... | 2,834 | 1,800 | 762 | 698 | 311 | ... | ... | ... | ... | ... | 14,795 |
| cts..... | ... | ... | 212 | 200 | 120 | 120 | 1,537 | 880 | 1,440 | 840 | 160 | 160 | ... | ... | ... | ... | 3,460 |
| ation | 16 | 16 | 133 | 133 | 250 | 250 | ... | ... | 420 | 420 | 1,339 | 1,339 | 331 | 331 | \$11 | \$11 | 2,500 |
| Grants | 128 | 128 | 335 | 335 | 393 | 393 | 110 | 110 | 182 | 182 | 2,693 | 2,693 | 1,138 | 1,138 | 1,521 | 1,521 | 6,500 |
| Research cts | ... | ... | 100 | 100 | ... | ... | ... | ... | 700 | 700 | 1,380 | 1,380 | 1,600 | 1,600 | 724 | 724 | 4,500 |
| ..... | 600 | 864 | 700 | 874 | 600 | 641 | 400 | 451 | 300 | 444 | 2,669 | 3,378 | 2,500 | 2,664 | 2,428 | 2,674 | 10,150 |
| Total..... | 19,809 | 10,708 | 12,021 | 6,344 | 2,413 | 1,404 | 5,181 | 3,241 | 3,804 | 3,284 | 8,552 | 8,950 | 8,465 | 6,633 | 4,684 | 4,930 | 64,900 |
| ..... | (12,382) | (8,144) | (11,009) | (5,170) | (1,493) | (643) | (2,944) | (1,910) | (1,364) | (1,300) | (4,343) | (4,032) | (3,002) | (1,969) | (1,532) | (1,532) | (38,000) |
| s..... | (6,827) | (1,700) | (312) | (300) | (320) | (120) | (1,837) | (880) | (2,140) | (1,540) | (1,540) | (1,540) | (2,963) | (2,000) | (724) | (724) | (16,660) |
| ..... | (600) | (864) | (700) | (874) | (600) | (641) | (400) | (451) | (300) | (444) | (2,669) | (3,378) | (2,500) | (2,664) | (2,428) | (2,674) | (10,150) |

icable to authorization under section 6(e)(1) under the Federal Water Pollution Control Act, as amended, and available until expended.
icable to authorization under section 6(e)(2) under the Federal Water Pollution Control Act, as amended, and available until expended.
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FWPCA RESEARCH, DEVELOPMENT AND DEMONSTRATION FISCAL YEARS 1969 and 1970 By Program



Grants

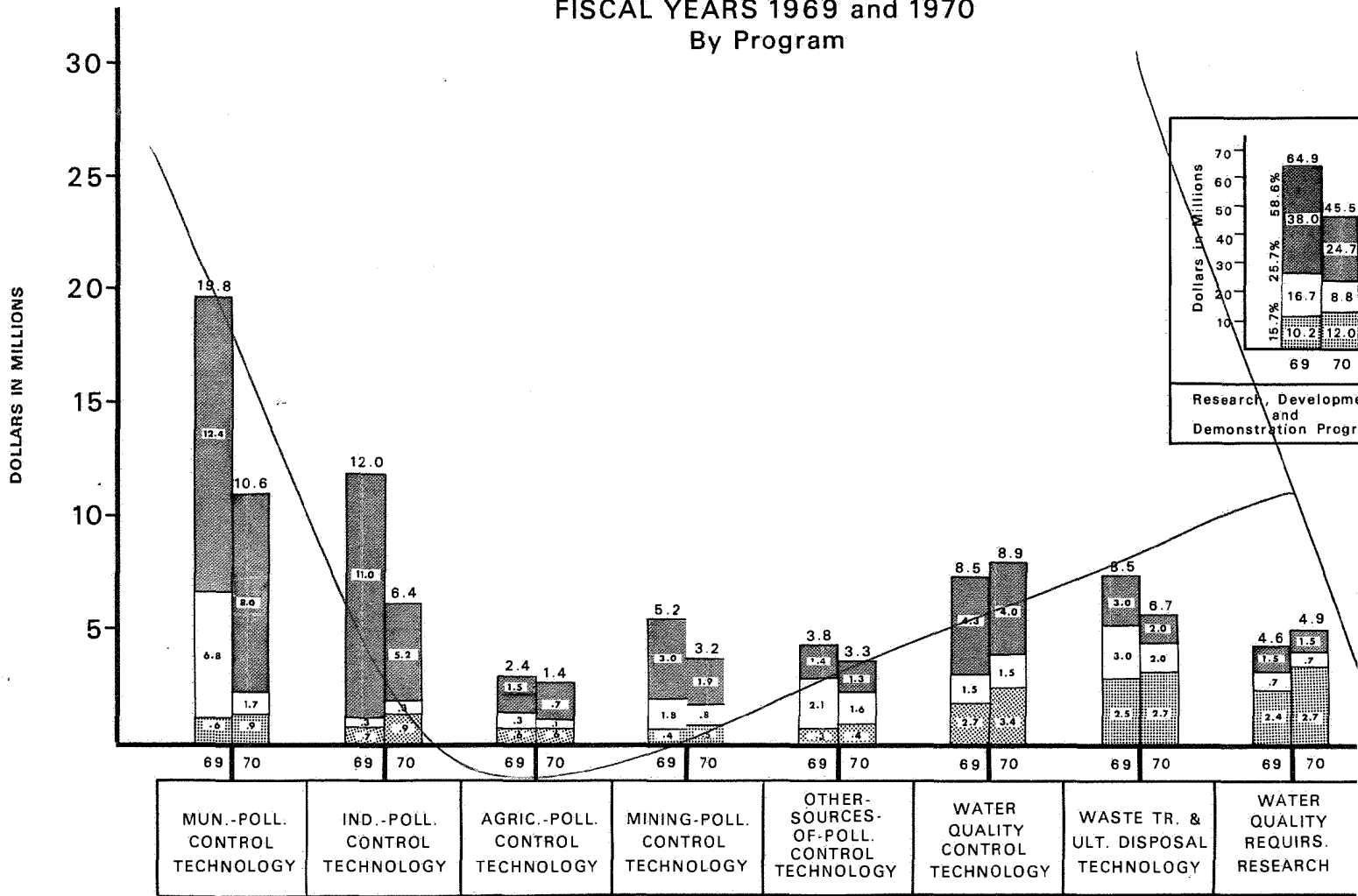
Contracts

House

FY 1969 INCLUDES \$21.3 MILLION OF UNOBLIGATED FUNDS CARRIED OVER FROM FY 1968

See next page for subprogram elements

FWPCA RESEARCH, DEVELOPMENT AND DEMONSTRATION FISCAL YEARS 1969 and 1970 By Program



Grants
Contracts
In House

FY 1969 INCLUDES \$21.3 MILLION OF UNOBLIGATED FUNDS CARRIED OVER FROM FY 1968
See next page for subprogram elements

(Janu

Planning, assistance & Training activities

g. assistance and training activities

| | <u>FY 1968</u> <u>Amount</u> <u>Available</u> | <u>FY 1969</u> <u>Amount</u> <u>Available</u> | <u>FY 1970</u> <u>Estimate</u> | <u>Increase (+)</u> <u>or Decrease (-)</u> <u>1970 Compared</u> <u>with 1969</u> |
|------------------------------|---|---|-----------------------------------|---|
| ensive planning..... | \$18,945,621 | \$19,994,000 | \$20,600,000 | +\$606,000 |
| ds and controls..... | 1,389,884 | 1,548,000 | 1,652,000 | +104,000 |
| al support and services..... | 6,939,112 | 7,708,000 | 9,360,000 | +1,652,000 |
| g..... | 4,778,978 | 5,062,000 | 5,884,000 | +822,000 |
| ated balance lapsing..... | 509,405 | ... | ... | ... |
| Total..... | 32,563,000 | 34,312,000 | 37,496,000 | +3,184,000 |

assistance and training activities

| | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 Compared with 1969</u> |
|---------------------------|---|---|-----------------------------|---|
| ensive planning..... | \$18,945,621 | \$19,994,000 | \$20,600,000 | +\$606,000 |
| and controls..... | 1,389,884 | 1,548,000 | 1,652,000 | +104,000 |
| support and services..... | 6,939,112 | 7,708,000 | 9,400,000 | +1,692,000 |
| ..... | 4,778,978 | 5,062,000 | 5,844,000 | +782,000 |
| ed balance lapsing..... | 509,405 | ... | ... | .. |
| Total..... | 32,563,000 | 34,312,000 | 37,496,000 | +3,184,000 |

State and Interstate agency program grants

| | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) Decrease (-) Over 1969 |
|---|--------------------------------|---------------------|---|
| 1. State and interstate agency program grants..... | \$10,000,000 | \$10,000,000 | ... |
| 2. Comprehensive basin planning | | | |
| (a) Grants..... | 1,250,000 | 2,000,000 | +\$750,000 |
| (b) Federal planning and studies..... | 8,024,000 | 8,300,000 | +276,000 |
| 3. Estuarine studies..... | 720,000 | 300,000 | -420,000 |
| Total..... | 19,994,000 | 20,600,000 | +606,000 |

1. State and interstate agency program grants: Fiscal year 1969, \$10,000,000; fiscal year 1970, \$10,000,000; no change.

Objective

Section 7 of the Federal Water Pollution Control Act, as amended, authorizes grants to States and interstate agencies to assist in meeting the costs of establishing and maintaining adequate measures for preventing and controlling water pollution, including the training of personnel. In 1967 the Federal Water Pollution Control Act, as amended, authorized \$5 million for this purpose. However, in passing the Clean Water Restoration Act of 1966, Congress increased the authorization to \$10 million for fiscal years 1968 through 1971. Therefore, the request is for \$10 million, the full amount authorized by the Federal Water Pollution Control Act, as amended.

It should be noted that the request for 1970 provides \$9.4 million for States and \$0.6 million for the eligible interstate agencies that participate in the program as compared to \$9.0 million and \$1.0 respectively for 1969. This adjustment in the distribution of the request increases the total available for States with a comparable decrease for interstate agencies and is based on the following:

(a) Past experience in the use of the funds made available to States and interstate agencies has shown a need to adjust such allotments in response to the ability of both State and interstate agencies to provide required matching in light of changing program activity.

(b) The accelerated rate of expenditures by States to meet their expanding pollution control programs requires a more equitable distribution of Federal financial support.

Program of Work

State agencies are the first line of defense in the national water pollution control effort, and during the next few years their responsibilities will increase as that effort gains momentum. Increased State capability is needed to enable them to initiate or expand their activities in conducting field studies of actual and potential water pollution problems; to assure compliance to approve water quality standards and implementing plans; to develop a surveillance program to provide

Accomplishments

To assure the most effective utilization of Federal support, FWPCA issued "Guidelines for Developing Program Plans for State and Interstate Agencies." These guidelines set forth the essential elements of an effective program plan as a basis for receiving the Federal grant. For 1969 and beyond, the guidelines and program materials have been improved to accommodate and guide both State and interstate agencies plan, program and budget resources to meet water quality objectives in a more orderly and timely fashion. Each agency applicant must now describe how it will carry out a broader improved water pollution control program with the increased Federal grant.

In 1963 a study by the Senate Committee on Public Works, "A Study of Pollution--Water," (Staff Report to the Senate Committee on Public Works, 88th Congress, 1st Session, Committee Print), indicated that few States had adequate water pollution control programs. The need for State program improvement was further highlighted in a study, "Staffing and Budgetary Guidelines for State Water Pollution Control Agencies," done by the Public Administration Service for the Public Health Service in 1964. Despite recent strengthening and improvement by a number of States, many State programs are still considered marginal, although program effectiveness is difficult to quantify. The above overall evaluation was based upon FWPCA's review of State program plans for 1968 and 1969 which considered such factors as State agency authority, budget, staff (including salary levels); treatment plant operator certification; establishment of intrastate water quality standards; water quality planning activity; and water quality monitoring. The kind and degree of improvement needed varies widely from State to State. During the next five years, every effort will be made to assist in upgrading State programs.

Program grants are also awarded to interstate pollution control agencies. These interstate agencies, such as the Delaware River Basin Commission and the Ohio River Valley Water Sanitation Commission, likely will assume a more important role with a growing emphasis upon basinwide cleanup. In addition, basin planning grants under Section 3(c) of the Federal Water Pollution Control Act, as amended, may lead to the establishment of new permanent interstate agencies which could become eligible for continued program support under the State and interstate program grants provisions under Section 7 of the Federal Water Pollution Control Act, as amended, in the future.

In view of the foregoing, continued financial assistance is important to the States and interstate agencies in maintaining and improving their programs. State expenditures for water pollution control programs have increased from about \$14 million in 1963 to approximately \$22 million in 1968. This trend is expected to increase in light of intensified Federal activity requiring greater efforts by the States, as well as a general acceleration of pollution control efforts on the part of many States.

Allocations of Grant-in-Aid Funds for Water Pollution Control

| State and Territory | 1968 Actual | 1969 Allocation | 1970 Allocation | Increase (+) or Decrease (-) |
|----------------------|----------------|--------------------|--------------------|------------------------------------|
| Alabama | \$186,823 | \$183,900 | \$192,000 | +\$8,100 |
| Alaska | 19,760 | 19,700 | 20,000 | +300 |
| Arizona | 71,584 | 72,500 | 75,500 | +3,000 |
| Arkansas | 113,525 | 111,900 | 116,700 | +4,800 |
| California | 620,357 | 623,900 | 653,300 | +29,400 |
| Colorado | 81,363 | 80,700 | 84,000 | +3,300 |
| Connecticut | 160,609 | 160,500 | 167,600 | +7,100 |
| Delaware | 82,069 | 81,900 | 85,200 | +3,300 |
| District of Columbia | 60,776 | 84,500 | 88,000 | +3,500 |
| Florida | 254,979 | 252,300 | 263,800 | +11,500 |
| Georgia | 214,650 | 210,800 | 220,400 | +9,600 |
| Hawaii | 65,232 | 65,100 | 67,600 | +2,500 |
| Idaho | 41,337 | 41,100 | 42,500 | +1,400 |
| Illinois | 409,135 | 407,900 | 426,900 | +19,000 |
| Indiana | 218,582 | 216,800 | 226,600 | +9,800 |
| Iowa | 120,684 | 117,100 | 122,100 | +5,000 |
| Kansas | 92,005 | 93,600 | 97,500 | +3,900 |
| Kentucky | 164,642 | 161,800 | 169,000 | +7,200 |
| Louisiana | 178,858 | 177,400 | 185,300 | +7,900 |
| Maine | 62,711 | 61,000 | 63,400 | +2,400 |
| Maryland | 173,515 | 173,300 | 181,100 | +7,800 |
| Massachusetts | 256,390 | 254,900 | 266,500 | +11,600 |
| Michigan | 339,972 | 338,500 | 353,900 | +15,400 |
| Minnesota | 150,628 | 148,100 | 154,600 | +6,500 |
| Mississippi | 144,881 | 142,900 | 149,000 | +6,100 |
| Missouri | 187,529 | 188,300 | 196,700 | +8,400 |
| Montana | 38,514 | 38,200 | 39,500 | +1,300 |
| Nebraska | 55,710 | 64,700 | 67,300 | +2,600 |
| Nevada | 23,895 | 23,800 | 24,300 | +500 |
| New Hampshire | 60,997 | 60,400 | 62,800 | +2,400 |
| New Jersey | 295,106 | 295,900 | 309,500 | +13,600 |
| New Mexico | 51,419 | 50,400 | 52,300 | +1,900 |
| New York | 635,884 | 632,300 | 661,900 | +29,600 |
| North Carolina | 259,717 | 254,500 | 266,100 | +11,600 |
| North Dakota | 38,212 | 37,400 | 38,600 | +1,200 |
| Ohio | 427,485 | 425,300 | 445,000 | +19,700 |
| Oklahoma | 113,929 | 112,700 | 117,700 | +5,000 |
| Oregon | 91,445 | 92,100 | 95,900 | +3,800 |
| Pennsylvania | 473,661 | 467,900 | 489,700 | +21,800 |
| Rhode Island | 94,993 | 104,600 | 109,000 | +4,400 |
| South Carolina | 155,366 | 151,000 | 157,700 | +6,700 |

| State or Territory | 1968 Actual | 1969 Allocation | 1970 Allocation | Increase (+) or Decrease (-) |
|--------------------|----------------|--------------------|--------------------|------------------------------------|
| | | | | |
| Vermont | 42,345 | 42,100 | 43,600 | +1,500 |
| Virginia | 204,064 | 200,900 | 210,000 | +9,100 |
| Washington | 123,104 | 123,900 | 129,400 | +5,500 |
| West Virginia | 107,476 | 105,800 | 110,300 | +4,500 |
| Wisconsin | 188,739 | 185,500 | 193,800 | +8,300 |
| Wyoming | 23,693 | 23,100 | 23,600 | +500 |
| Guam | 72,289 | 72,400 | 75,300 | +2,900 |
| Puerto Rico | 185,865 | 190,300 | 198,900 | +8,600 |
| Virgin Islands | 51,912 | 70,300 | 73,100 | +2,800 |
| Total | 9,000,000 | 9,000,000 | 9,400,000 | +400,000 |

Basis for allocation:

1. \$12,000 basic grant
2. Remainder: $\frac{2}{3}$ population weighted by per capita income
 $\frac{1}{6}$ population density
 $\frac{1}{6}$ number of "wet" industries

| | 1968 Actual | 1969 Allocation | 1970 Allocation | Increase (+) or Decrease (-) |
|--|----------------|--------------------|--------------------|------------------------------------|
| New England Interstate Water Pollution Control Commission Connecticut New Hampshire Massachusetts Rhode Island Maine New York Vermont | \$103,579 | \$135,900 | \$87,900 | -\$48,000 |
| Ohio River Valley Water Sanitation Commission Illinois New York Indiana Kentucky Ohio West Virginia Pennsylvania Virginia | 166,323 | 305,000 | 190,500 | -114,500 |
| Delaware River Basin Commission Delaware New Jersey New York Pennsylvania | 170,977 | 132,900 | 132,900 | ... |
| Interstate Sanitation Commission New York Connecticut New Jersey | 119,948 | 218,800 | 138,400 | -80,400 |
| Klamath River Compact Commission Oregon California | ... | 27,400 | a/ | -27,400 |
| Interstate Commission on the Potomac River Basin Pennsylvania Virginia Maryland West Virginia District of Columbia | 39,173 | 73,700 | 50,300 | -23,400 |
| Bi-State Development Agency Illinois Missouri | ... | 56,700 | a/ | -56,700 |
| Tennessee River Basin Water Pollution Control Commission Tennessee Mississippi Kentucky | ... | 49,600 | a/ | -49,600 |
| Total | 600,000 | 1,000,000 | 600,000 | -400,000 |

a/ Not active and have indicated they will not request any funds.

Basis for allocation:

- 2/3 population weighted by per capita income
- 1/6 population density
- 1/6 number of "wet" industries

Basin planning grants

controls are essential to assure that the massive investment in abating pollution will yield optimum returns in cleaning up entire stream systems. To achieve pollution control on a river basin approach, FWPCA is authorized to provide grants to non-Federal planning agencies to support the development of effective comprehensive water quality control and abatement programs and, through direct Federal effort, to prepare or develop pollution control action programs in cooperation with all concerned. The following are specific details on the activities carried out for this purpose:

a. Basin planning grants: Fiscal year 1969, \$1,250,000; fiscal year 1970, \$2,000,000; increase, \$750,000. The increase consists of:

| <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|--|------------------|--------------------------------|----------------------------------|--|
| <u>+\$750,000</u> | ... | \$2,000,000 | ... | Support eight new non-Federal basin planning agencies and provide increased support for those initiated in 1969. |

Need for Increase

This is a new program initiated in 1968; the program in 1968 and through the end of 1969 will have funded approximately 15 new basin planning programs. It is the goal of FWPCA in 1970 to stimulate the establishment of eight additional basin planning agencies at a cost of \$750,000 to develop effective comprehensive water quality control and abatement plans for specific basins. Particular emphasis will be given toward stimulating establishment of and supporting those agencies in basins with the most serious and complex water pollution problems in order that basinwide management systems can be under way during the early 1970's.

Objective

Section 3(c) of the Federal Water Pollution Control Act, as amended, provides for grants not to exceed 50 percent to planning agencies if they adequately represent State, interstate, local or international interests in the basin, and if they are capable of developing an effective comprehensive water quality control and abatement plan for a basin.

These grants are to financially assist each planning agency in the development of a comprehensive pollution control and abatement plan for the basin. Each of these plans developed must be consistent with applicable water quality standards established for the basin concerned. The planning agencies are to recommend treatment works and sewer systems for the most effective and economical means of collection, storage, treatment and purification of wastes as well as methods to encourage both municipal and industrial use of such works and systems. The agencies will recommend both maintenance and improvement of water quality standards within the basin as well as a plan for adequately financing facilities necessary in the execution of this maintenance and improvement.

The financial assistance which these grants provide will aid in the conservation of interstate waters and tributaries thereof for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, agricultural, industrial and other legitimate uses.

Congress recognized the need to initiate effective local water quality planning and management programs for river basins by providing Federal planning assistance. Therefore, the current program seeks to stimulate the establishment and continuing support of local institutional arrangements for coordinated management of water quality in river basins. The Federal assistance will be used to provide a catalyst in stimulating State and local cooperative action to develop and implement comprehensive basinwide pollution control programs.

By the end of 1970, about 23 agencies will be receiving support in developing solutions to basinwide water quality control problems and will also be generating information on the organization, design and execution of water quality planning studies as a basis for continuous improvement of planning methods.

Accomplishments

The planning grant program is currently in the early stages of development. The first appropriation under the 1966 authorization was \$500,000 for 1968, and was increased to \$1,250,000 for 1969. To assist prospective grantees, FWPCA has prepared and distributed "Guidelines for Grants--Comprehensive River Basin Planning" to State, local and interstate pollution control agencies. These assert that the basic purpose of a pollution control plan is to (1) serve as a guide for effective action to eliminate and control pollution throughout interstate or intrastate basins; and (2) establish permanent basinwide water quality management programs which involve joint effort of States, local and metropolitan bodies as well as private interests. An essential feature of a basin plan is the action program which identifies and evaluates alternative approaches to implementation including necessary fiscal arrangements and appropriate institutional frameworks through which States and local communities can continuously coordinate their efforts to control pollution in the basin.

Six water quality planning agencies are currently receiving grant assistance for the preparation of basinwide pollution control plans. Interest is widespread because of problems being encountered in meeting pollution control requirements in metropolitan areas, in meeting water quality standards, and in overcoming organizational hurdles to regional water quality management programs. Several States have initiated regional water resources planning programs and are providing leadership in incorporating water quality control needs in such programs. Because prospective requests for assistance exceed available funds, regional offices of FWPCA are identifying problems requiring regional solutions and are setting priorities for assistance.

Federal planning and studies

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | <u>Explanation</u> |
|-----|-------------------------------------|------------------|----------------|------------------|--|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | |
| (1) | +\$13,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +218,000 | ... | \$365,000 | 6 | Provide funds to expand and detail in more depth the National Requirements and Cost Study Reports required by the Clean Water Restoration Act of 1966. |
| (3) | <u>+45,000</u> | <u>...</u> | 100,000 | ... | Increase for economic and statistical analysis and projections for use in water resource planning to be provided by the Office of Business Economics, U.S. Department of Commerce. |
| | <u>+276,000</u> | <u>...</u> | | | |

Need for Increase

An additional \$218,000 is requested for the National Requirements and Cost Study, required annually by law. As required by Section 16 of the Federal Water Pollution Control Act, as amended, special studies are undertaken annually to provide Congress with a basis for evaluating authorized programs, and developing new programs.

Assessment of the Nation's needs and related costs involved in controlling pollution from municipal, industrial, agricultural, mining and other sources is essential to national policy making. If the annual updated reports as required are to have maximum utility, information gaps regarding needs and costs must be filled. Accordingly, as future reports are issued, the amount and reliability of the data will be improved. Information exchange with State and local planning agencies will be encouraged as will exchange of program-related information from other Federal agencies. Better methods will be sought to evaluate programs, progress and benefits. Participation of industry, educational institutions and nonprofit organizations will be encouraged to stimulate the highest quality of professional interest in this important national problem.

The resources proposed will be used to carry out waste control studies for industrial activities utilizing contractors and other government agencies with expertise in the particular area of study and for increased effort, through support of regional and other intra-FWPCA and outside organizational elements, in developing hard data on the magnitude of other effluent problems, means of control and costs. Additional economic support to the regions will also be provided in terms of consultation and by provision of summary data and analyses developed by the cost studies which are applicable to program and river basin planning. Such special data compilations and special reports cannot be undertaken with current funding and manpower levels.

Objective

The legislative history underlying the passage of the Clean Water Restoration Act of 1966 places an important mandate on FWPCA to orient pollution control in the United States toward a basinwide basis. Effective planning will be essential to assure that the massive Federal investment in the costs of abating pollution, provided for in the Federal Water Pollution Control Act, as amended, will yield optimum returns in cleaning up entire stream systems. The planning activities will be the focal point for this effort.

Section 3 of the Federal Water Pollution Control Act, as amended, provides for the development of river basin water quality management programs; for studies of the need and value of storage in Federal reservoirs for regulation of streamflow for the purpose of water quality control; and for financial assistance to basin planning agencies. The latter provision was added by the Clean Water Restoration Act of 1966.

The specific objectives of Section 3 are as follows:

(a) Develop a comprehensive guide to pollution control actions--both immediate cleanup needs and long-range preventive measures--necessary in each major river basin. The thrust of river basin water quality management planning will be directed toward complementing the water quality standards and State program planning activities. The extent and nature of Federal planning activities necessary to accomplish this will be related to the extent to which State and local planning activities are making a contribution in the basin concerned. Coordination of pollution control plans with water resource development is an important element in the planning activity. Participation in Federal interagency water resources planning, as scheduled by the Water Resources Council, assures this coordination.

(b) Provide to Federal construction agencies reports regarding the inclusion of storage for regulation of streamflow for the purpose of water quality control.

(c) Guide, assist and encourage the activities of State-local basin planning agencies.

Section 16 of the Federal Water Pollution Control Act, as amended, requires special studies be updated and submitted annually to provide Congress with a basis for evaluating authorized programs, development of new programs and information necessary for authorizing appropriations.

Program of Work

Water quality management planning

Although the same level of planning is being supported, the river basin water quality management program is being reoriented to reflect those pollution control planning actions most necessary in managing the Nation's clean waters.

Since their establishment, these planning projects have provided the technical and scientific resources necessary to support the development of pollution control plans and programs. In addition, they have provided the resources and capability needed to support closely related pollution control investigations and activities. This has often involved studies of a more detailed, technical nature than would be needed merely to support planning. For example, project staffs provided the principal source of support for the review and development of water quality standards. Data collected in connection with river basin studies...

the following general lines:

(1) More emphasis is being given to the nontechnical ingredients of planning that are essential to effective pollution control programs. Attention in 1969 is being focused on minimizing technical inputs not essential to decision making in the planning process and on strengthening staff planning capabilities. This does not mean, however, that some technical activities found not essential to planning will not be continued, if they are essential to support other related program purposes. For example, certain data collection and monitoring activities must be continued and expanded because of the need to support the implementation phase of water quality standards. There will be continued effort to identify such essential technical activities and, if necessary, to reflect this through future comparative transfers to items such as technical support and services.

(2) The reorganization of the planning capability involves establishment of staff competence in each regional office to spearhead planning in geographical areas not previously covered. Emphasis is on developing outlines of basinwide pollution control action programs which can be implemented immediately, on providing technical guidance to basin planning agencies, and relating State-local planning efforts to Federal planning. This effort will result in more effective individual river basin water quality management plans.

(3) Headquarters activities will involve program review and guidance and development of new policies and methods to accomplish the objective of basinwide control programs and planning. As a special technical effort, there will be a continuing attempt to perfect mathematical procedures for simulating water quality responses and for testing the cost and effectiveness of pollution control measures. This is the technology which led to development of the Delaware Estuary Program. Headquarters will provide problem solving backup to regional planning projects and instruct and guide field personnel in the application of new computer programs and systems analysis techniques.

Interagency water resource planning

(1) Water Resources Council -- Type 1 and Type 2 Studies: Participation in interagency water and related land resources planning carried out under the direction of the Water Resources Council will continue in eight Type 1 and six Type 2 studies.

Water quality management plan development will be continued in association with interagency water resource planning and with State and interstate planning wherever appropriate. In some cases, where interagency planning efforts are not under way or where State or local efforts are not adequate, the Federal water pollution control program must spearhead the planning task in order to meet the problem of pollution control in the shortest possible time. For example, although Type 1 interagency water resources study is under way in the Great Lakes Basin, FWPCA has already completed reports on Lake Erie, Lake Michigan and Lake Ontario in answer to meeting the needs for immediate actions on pollution control.

Since many of the basin planning activities provide data which is also needed for interagency water resource plans and plans of other Federal and State agencies, any reduction in that effort would affect interagency and other Federal and State plan activities.

(2) Interagency reports and reviews: Studies will continue to be carried

In 1970 it is anticipated that approximately 100 projects will be under study and 30 reports prepared. There will be an additional emphasis on improving stream-flow regulation activities to make them more meaningful along the lines outlined in the Department of the Interior's policy on reservoir storage for flow regulation for water quality control in Federal and federally supported water projects. This policy gives increased recognition to the effects on water quality of storage for all uses, including water supply, recreation, irrigation, navigation and fish and wildlife, and emphasizes the value of such storage and uses provided for in establishing need for further quality control measures.

This activity also will provide necessary reviews and comments on water and related land resource development proposals in project reports under Interagency Review Procedures and Executive Order 11288. It is estimated that water quality aspects of approximately 200 planning reports of other agencies will be reviewed. These include Federal Power Commission and Atomic Energy Commission license applications, Corps of Engineers reports, Soil Conservation Service plans and Bureau of Reclamation reports.

State and regional planning grant assistance

A considerable amount of effort will be devoted to encouraging the formation of planning agencies, providing assistance in their formation, reviewing applications of basin planning agencies to determine need for and adequacy of proposed planning activities, and providing assistance in planning. Grants will be awarded and administered in accordance with the provisions of Section 3(c) of the Federal Water Pollution Control Act, as amended, and prescribed regulations.

States have a primary and increasing responsibility in the national water pollution control effort. Additional technical assistance and administrative support will be directed to assisting States in increasing their capabilities. This effort will enable States to initiate or expand their activities in conducting planning studies; implementing water quality standards; establishing monitoring systems; training technicians and administrators as specialists in water resource planning and pollution control; and assisting communities and industries to effect abatement of pollution. Grants will be awarded and administered in accordance with Section 7 of the Federal Water Pollution Control Act, as amended.

National requirements and cost studies

Investigations and evaluations will continue for the national requirements and cost studies in accordance with Section 16 of the Federal Water Pollution Control Act, as amended. These include a continuing analysis of the economic impact on affected units of government of the cost of installing waste treatment facilities and a continuing analysis of the national requirements for and the cost of treating municipal, industrial, and other effluent to attain established water quality standards.

The assessment of national requirements and costs must be the basis for shaping as well as for evaluating FWPCA's operational programs. As such, the projected expenditures in economic and related analyses are expected to be a sound investment, eventually showing the way to more effective methods of doing business. Among the accomplishments will be a report to the Congress in January 1970 presenting the results of the year's activity. In addition, data and analytical results will be provided to FWPCA program elements as they may relate to their activities.

Accomplishments

this type will be completed in 1969. The report and findings of the Delaware Study have been incorporated into the program of the Delaware River Basin Commission and the FWPCA has continuously provided forecasting services, the evaluation of water quality control alternatives, and recommendations to the Commission.

2. Representative of recent accomplishments in the integration of water quality management planning in interagency water resource studies being coordinated by the Water Resources Council are: (a) The completion of Type 1 framework study on the Ohio River Basin and (b) the completion of Type 2 detailed comprehensive studies on the White, Big Muddy, Red River below Denison Dam and the Sabine River Basins. Another example of interagency coordination in water resources planning is the completion of the Appalachian Water Resources Studies, pursuant to the requirements of the Appalachian Regional Development Act of 1965. Individual water quality management planning activities in connection with the interagency water resource studies will continue or be expanded where required. The continuing coordination of FWPCA activities with those of other agencies represented on the Water Resources Council is reflected in the initiation of a study in 1969 for the Great Basin to coincide with the start of a comprehensive program development in that area by other Federal agencies and the States concerned.

3. Perhaps most representative of accomplishments of basin planning projects has been the support of closely related pollutional control investigations and activities in the work that has been done in carrying out Federal responsibility for surveillance, investigations and recommendations of enforcement actions. For example, data collected from the Lake Michigan studies have been used in the preparation of reports on the Lake Michigan Basin which were the basis of Federal actions in the Lake Michigan Enforcement Conference held in Chicago on January 31, 1968. In another area, the Hudson-Champlain Project provided data for the Hudson River Enforcement action and continues to carry out surveillance activities of the Hudson River main stream in accordance with recommendations of the conference. Other specific examples of accomplishments related to supporting the development of pollution control plans and programs include (a) evaluation of the effect of the Texas Water Plan on Rivers in the Western Gulf Basins by the Western Gulf Project, and (b) participation in the work of the Potomac River Interdepartmental Task Force, including completion of a simulation model of the Potomac estuary, completion of a waste inventory of the Potomac basin in Maryland, and development of background information on water quality in the estuary.

4. During 1969 approximately 35 studies will be carried out for Federal construction agencies concerning the need for and value of storage for quality control in reservoirs. Since 1960, FWPCA has carried out a total of 302 studies-- 213 studies for the Corps of Engineers, 88 studies for the Bureau of Reclamation and one joint Corps of Engineers - Bureau of Reclamation study.

5. All water resource project reports of the Corps of Engineers, Bureau of Reclamation and Soil Conservation Service are reviewed from a water quality standpoint prior to their transmittal to Congress for approval. Since 1963 FWPCA has reviewed 361 Corps of Engineers reports, 85 Bureau of Reclamation reports and 718 Soil Conservation Service reports. It is estimated that 110 of these reports will be processed during 1969.

6. Under the authority of Section 4 of the Federal Power Commission Act, FWPCA reviews and comments on all applications for new licenses for hydroelectric generating operations, as well as the renewal of old licenses. The applications are reviewed from the standpoint of Departmental policy relative to the maintenance of adequate stream quality. It is estimated that during 1969 45 of these

1969. In addition to taking a new view of the concept of "backlog" in the context of the 1968 facilities inventory, a profile of the organic chemical industry and the costs associated with its treatment requirements was prepared for this year's report. Further work in 1969 will synthesize the results of cost and inventory analyses into a generalized computational format for computer estimation which will by the end of 1969 make it possible to evaluate municipal costs in a rapid and timely fashion.

8. A study of user charges as a vehicle for financing waste treatment facilities will be submitted to the Congress in January 1969.

9. Mathematical models for both static and dynamic optimization of alternative water quality management techniques have been developed and applied to test situations. The general nature of the formulations will make available for regional application new, significant analytical tools. In addition significant progress has been made in the development of dynamic models for the determination of reservoir operating rules for water quality management purposes. An example of the application of these techniques is the development of a model for a subbasin in the Ohio River Basin which indicates how a change in the operating rules of a flood control reservoir could result in improving water quality in the subbasin without increasing the flood risk.

10. A general simulation model capable of handling relatively large basins as discrete units has been finalized after several years of development and a complete description of applications and instructions for operation has been prepared. Application of this model in the analyses of water quality standards in certain States assisted in resolving questions of primary versus secondary treatment requirements as they related to proposed water quality standards.

COMPREHENSIVE PROGRAMS
MAJOR RIVER BASINS



Estuarine Studies

3. Estuarine studies: Fiscal year 1969, \$720,000; fiscal year 1970, \$300,000; decrease, \$420,000. The decrease consists of:

| <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|--|------------------|--------------------------------|----------------------------------|---|
| <u>-\$420,000</u> | ... | \$300,000 | 9 | Reduction due to final report required to be submitted to Congress in mid-1970. |

Objective

Section 5(g)(1) of the Federal Water Pollution Control Act, as amended, provides for a comprehensive study of the effects of pollution in estuaries. This endeavor will be in cooperation with the Departments of Army and Agriculture, the Water Resources Council, and any other appropriate Federal, State, interstate or local public leaders, private organizations, institutions, and individuals.

Specifically, the Federal Water Pollution Control Act, as amended, provides for the following:

1. Developing a comprehensive study of the effects of pollution, including sedimentation, in the estuaries and estuarine zones of the United States.
2. Determining the effects of pollution in these estuarine areas, on fish and wildlife, sport and commercial fishing, recreation, water supply and water power, and other beneficial uses.
3. Considering the effects of demographic trends, exploitation of mineral resources and fossil fuels, land and industrial development, navigation, flood and erosion control, and other uses of estuarine zones upon the pollution of waters therein.
4. Identifying the problems and areas where further research and study are required as determined from investigations of representative estuaries and estuarine zones.
5. Delineating recommendations for a comprehensive national program for the preservation, study, use and development of estuaries of the Nation, and the respective responsibilities which should be assumed by Federal, State and local governments, and by public and private interests.

Program of Work

FWPCA has taken the lead as authorized and directed in the Act to conduct, in cooperation with other appropriate Federal, State, interstate, and local public bodies and private organizations, institutions, and individuals, a comprehensive study of the effects of pollution upon the aquatic environment of the Nation's estuaries. A report of this study is to be made to Congress about the end of calendar year 1969. It will analyze the importance of estuaries to the economic and social well-being of the people of the United States and the effects of pollution on the beneficial and sometimes nonbeneficial uses of estuaries; it will discuss major social and economic trends in the estuarine zones; and the report will recommend a comprehensive national program for the management, preservation, study and use of estuaries.

The estuary study is being carried out primarily through contacts with public and private agencies and will utilize information and data already available to Federal, interstate, State and local agencies to the maximum extent possible. Advice and counsel are being solicited from all interested official agencies and

national interest groups. Public meetings in the coastal States provide the general public and local organizations with an opportunity to express their views on estuarine values and utilization. Results of these meetings will be analyzed as a significant indicator of local views on estuarine values, uses, and management.

The project is structured to recognize the vast differences which prevail in the several major coastal areas of the country, including the Arctic and Central Pacific areas.

Primary efforts until at least mid-1970 will be directed toward the completion and submission of the final report to Congress, the analyses required by the report, and the preparation and review by our appropriate agencies of the recommendations that must be submitted. For the remainder of 1970 and beyond, the staff of the office will be principally engaged in monitoring and reviewing progress in recommendations made, review of actions required by further legislation, and evaluation and coordination of research and study efforts.

Accomplishments

A broad spectrum of estuarine pollution information and data has been located and is now being obtained through other public and private agency contacts and agreements, contractual studies, and the findings of other FWPCA activities concerned with the estuarine environment.

Of prime importance are the recommendations that must be made for the estuarine management plan. These recommendations must reflect the views of States, local governments, and private and public organizations--besides the Federal Government--who are interested, responsible for management, and vitally concerned with successful preservation and use. Twenty-seven of the 30 scheduled public meetings have been held in the various coastal States and territories. The multitude of people, interests, and vocations represented at these meetings indicate the highly enthusiastic level of responses from the non-Federal sectors to these opportunities to express their views and register their ideas. These meetings have proved to be an outstanding mechanism for obtaining the opinions and views of local governments, user groups such as industry and the fisherman, conservation groups, academic institutions and private individuals. The transcripts of these meetings are carefully analyzed, and statistical summaries will be made of the opinions expressed. The analyses are already indicating that the resulting information and opinions will have a significant impact on the emphasis of the recommendations.

In the past year, substantial progress has been made on the National Estuarine Inventory which will contain the maximum available information on some 864 estuaries and will be automated on tape. The Handbook of Descriptors names and numbers these estuaries and outlines the data being gathered. The Inventory data will span the gamut from type and areas, through habitat values to water quality and use damages. Preliminary priorities have been established as a guide for directing emphasis to estuarine areas believed to be of special significance for the Study--approximately 50 selected estuarine areas have been named for special attention.

The Inventory will have an additional, most important, value of vividly showing the exact data and knowledge gaps which we know exist but not in finite terms.

Through consultations, meetings, correspondence, conferences, and agreements the Study is maintaining contact and obtaining useful data, information, and views from all interested Federal and State government agencies, national organizations, other public organizations, and individuals. The Study has now reached the stage where the basic studies and analyses necessary to back up the formal report are commencing.

Federal agencies and the States are providing information to define their estuarine-involvement profile of activities, capabilities, and views; preliminary results indicate that this is an effective mechanism for yielding this information. The Study has negotiated about 20 contractual agreements to gather data and information on the estuaries on a nationwide and areal, case-study basis.

Based on progress reports these agreements are providing masses of information on the socio-economic, ecological, sedimentation, pollutional, legal, demographic, management, and community planning characteristics of the estuaries. For views on research and study needs, the Study has contacted eminent national groups and their initial responses seem to be highly satisfactory.

The bulk of the contract data is due approximately January 1969, and in addition, the detailed report of State activities and organizations will be available. The study and analysis period will be coupled with preliminary reviews of recommendations.

Water quality standards coordination and management

b. Standards and controls

| | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) Decrease (-) Over 1969 |
|--|--------------------------------|---------------------|---|
| 1. Water quality standards coordination and management | \$752,000 | \$752,000 | ... |
| 2. Control of pollution from Federal activities..... | 796,000 | 900,000 | +\$104,000 |
| Total..... | 1,548,000 | 1,652,000 | +104,000 |

1. Water quality standards coordination and management: Fiscal year 1969, \$752,000; fiscal year 1970, \$752,000; no change.

Objective

As provided by Section 10(c) of the Federal Water Pollution Control Act, as amended, establish water quality standards applicable to interstate and coastal waters to ensure the protection of high quality waters and the enhancement of presently polluted waters. When standards are set for all interstate and coastal waters--whether by State action or, if necessary, by Federal intervention--the Nation will have, for the first time, a body of specific goals and objectives for its waters and, in the implementation plans, realistic means for accomplishing those goals and objectives. Clearly, this will be a landmark in water resource conservation. Attainment of the water quality set in the standards will constitute FWPCA's principal program objective in the future. Because most of the water quality standards call for compliance with conventional waste implementation plans in about a five-year period, full attainment of the objective is not expected until the end of 1973.

Program of Work

Following approval of the standards, the second phase will begin; FWPCA will begin to seek and observe compliance with the standards. Although States have first responsibility, FWPCA will continuously review the extent of which implementation plans are being carried out. Extensive water quality monitoring by FWPCA, as well as State and other Federal agencies, will be important in the review process. Knowledge gaps discovered in the standard setting phase indicate a need for special studies to deal with various technical problems. Marine waste disposal, salinity and temperature are three examples. Research is also needed to improve our judgements concerning water quality requirements. Finally, the water quality standards will have to be revised and upgraded at such time in the future as technical knowledge improves and as waste disposal conditions and water use change.

Included in activities planned for 1970 are the following:

(a) Initiating the establishment of approvable standards where States have failed to act.

To the extent that this activity is found necessary, it will be started in 1969, but should be terminated by the end of 1970. It will require coordination of technical programs to develop the necessary data and will require the planning and execution of public hearings.

(b) Initiating programs to provide continuing evaluation of progress toward fulfilling implementation.

A program will have to be established to provide periodic reports on the status of compliance with water quality standards and particularly the implementation plans

developed by the States. Vigorous surveillance on progress in meeting implementation plan goals will be required on a continuing basis. A detailed review on progress will be required at least twice each year.

(c) Revising water quality standards where appropriate.

A number of standards revisions will be required to reflect changing conditions and changing information. In 1970, the emphasis will be on resolving issues which have resulted in exemptions from approved State standards, and making the necessary revisions. This will involve conduct of studies and compilation of data as required to support the needed changes.

(d) Analyzing basic data to identify the effectiveness of water quality standards.

Basic data must be collected, catalogued and analyzed in order to determine effectiveness of standards programs.

(e) Reviewing and evaluating new and existing scientific and technical information for standards decision-making purposes.

A program will be initiated to develop a water quality criteria intelligence system of scientific and technical information appropriate for standards decision-making purposes, and to make this information available to the States under a continuing program of assistance. Effective liaison will be established with State and Federal water resources agencies and other institutions involved with water quality and use.

Proposed activities: The water quality standards set the goals and objectives of nationwide water pollution control programs. Utilizing a small core staff, the major effort of the standards program will be to coordinate, direct and evaluate activities toward achieving these goals and objectives. Other operating programs within FWPCA will be called upon to perform the necessary surveillance, technical studies, and other activities leading to successful implementation of water quality standards.

Accomplishments

By the beginning of 1970, Federal approval action will have been taken on all water quality standards including necessary revisions on items previously exempted in partial approvals of some standards. As of January 1969, standards from 46 States and four other jurisdictions had received approval to varying degrees by the Secretary of the Interior. Federal action may be necessary to establish acceptable standards in a few States which have as yet failed to revise and modify their proposed standards to satisfy requirements of the Federal Water Quality Act of 1965, as amended.

Control of pollution from Federal activities

2. Control of pollution from Federal activities: Fiscal year 1969, \$796,000; fiscal year 1970, \$900,000; increase, \$104,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$3,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +101,000 | +10 | \$900,000 | 61 | To expand program for assisting Federal agencies in controlling water pollution from their activities. |
| | <u>+104,000</u> | <u>+10</u> | | | |

Need for Increase

An increase of \$101,000 and 10 positions is needed to expand and strengthen the Federal activities coordination program. Work load, especially demands for assistance from the other Federal agencies, has continually exceeded the available manpower since the inception of this program. Additional staff will permit the program to meet present demands and to provide more effective, but more importantly, timely assistance to Federal agencies in carrying out their programs for controlling water pollution from their activities. Such assistance is particularly essential in the design of water pollution control measures for new facilities, surveillance of waste treatment and disposal practices at existing installations, and the establishment of water pollution control requirements in connection with certain Federal loan, grant, and contract practices.

Objective

Under Executive Order 11288 and Section 11 of the Act, Federal agencies are obligated to prevent and control pollution from their activities. The Federal activities coordination program implements the responsibilities assigned the Department of the Interior.

The Executive Order requires positive action from each Federal agency, and implementing Section 11 of the Act requires their cooperation with the Secretary of the Interior and with State and local agencies. The Department of the Interior is responsible for providing the necessary technical advice and assistance to Federal agencies in developing adequate methods and facilities for preventing pollution from their activities.

The Department has heavy responsibilities in the following areas (some of which are conducted as a part of other ongoing FWPCA activities):

(1) New and existing facilities and buildings: Consult in the development of water pollution control measures for inclusion in plans for new or modified installations; review final plans for adequacy prior to construction; inspect existing treatment and pollution control works for adequacy.

(2) Federal water resources projects: Review plans and report on the potential impact on water quality.

(3) Facilities or operations supported by Federal loans, grants, or contracts: Assist Federal agencies in prescribing regulations requiring borrowers, grantees, and contractors to adhere to water quality standards similar to those imposed on direct Federal operations.

(4) Pollution from vessel operations: Review operation of and recommend pollution control measures to assure adequate treatment of wastes from federally operated watercraft.

(5) Intergovernmental coordination: Coordinate Federal agency water pollution control efforts with those of other Federal agencies, other FWPCA program elements, and with State, interstate, and local agencies.

Program of Work

(a) Provide consultation on water pollution control needs starting at the initial stages of planning for new or modified water pollution control facilities; review final plans for control and treatment measures prior to solicitation of construction bids; advise on adequacy and effectiveness of proposals. FWPCA will assist with approximately 500 such projects during 1970, of which at least two-thirds will reach final plan review.

(b) Provide continued technical assistance to the 10 Federal agencies already known to have loan, grant, contract, lease, license, and permit programs affecting water quality on water pollution control requirements to be applicable to those non-Federal activities which are supported or authorized by Federal loans, grants, contracts, leases, licenses, or permits. Encourage and assist other agencies to identify such programs in which there is an impact on water quality; review the results thereunder and recommend appropriate preventive or corrective action. It is expected that in 1970, 5,500 or more documents will be reviewed, one-third of which will require direct FWPCA involvement.

(c) Organize, coordinate, and conduct periodic on-site reviews of the waste treatment and disposal practices at Federal installations. Approximately 700 such reviews are expected in 1970, at least a third of which will be follow-up visits to problem sites.

(d) Advise and assist 17 agencies in the preparation of their annual reports to the Bureau of the Budget under Circular A-81, which are due July 1 of each year. These reports annually include over 1,500 separate projects for which corrective actions are programmed ahead through 1972. At least half of the projects reported July 1, 1969, will be programmed for 1971. FWPCA must review and evaluate these and prepare a report to the Budget Bureau recommending funding priorities.

(e) Review existing guidelines and republish with revisions reflecting program experience during 1967-1969.

(f) Complete data and reporting system and begin publication of periodic and special reports on water pollution control practices and needs at Federal installations. This will be coordinated with the FWPCA surveillance and monitoring activities as well as the municipal and industrial waste inventories.

Accomplishments

During 1968, the staff reviewed and evaluated the essential features of 504 water pollution control measures proposed by 17 Federal agencies to prevent or abate water pollution at facilities under their jurisdiction. Because of smaller 1969 budget allowances to these agencies, the number of projects reviewed is expected to remain about the same or to decrease as much as 25 percent.

Ninety-eight projects to construct new or improved waste treatment facilities at military installations authorized by the 1968 Military Construction Authorization Act were reviewed in accordance with the provisions of Section 808 of that Act. The water pollution control budget for 1969 for Defense Department installations provided funds for only 28 projects which must be reviewed under those provisions. The purpose of this review is to advise the Department of Defense whether the degree and type of waste disposal and treatment provided in the area around each installation is consistent with applicable Federal or State water quality standards and that the planned system for the installation is coordinated in timing with State, county, or municipal programs. This requirement was restated

and continued as permanent law by Section 807 of the Military Construction Act, 1969.

During 1968, technical assistance was provided to 10 agencies in developing water pollution control requirements for inclusion in specific loan, grant, and contract documents. Proposed provisions in 3,623 applications for grants, licenses, and permits were reviewed and comments on the potential impact on water quality were provided on 1,425. These included applications to the Corps of Engineers, Atomic Energy Commission, Federal Power Commission, and Bureau of Reclamation in the Department of the Interior. Activity in this area in 1969 is expected to increase as much as 25 percent as these 10 agencies become more familiar with this part of the program. This is one of the most time-consuming areas of the program.

On-site reviews were conducted at 546 existing installations for the purpose of advising the agencies as to the adequacy of waste treatment and disposal practices and effectiveness of operating procedures. The activity level in this program area should increase by at least a third in order to achieve an annual rate of inspections that will permit revisits at reasonable intervals. Present work loads in other program areas and shortages of field staff indicate that the number of inspections during 1969 will increase by no more than 10 percent.

Phased and orderly plans for 17 agencies for installing needed improvements to prevent or abate water pollution were reviewed during 1968 for the Bureau of the Budget and budget priorities recommended for approximately 461 proposed water pollution control projects costing about \$51 million. During 1969 review of agency projects proposed for 1970 recommended priorities for over 800 projects worth nearly \$47 million.

Numerous requests for information and complaints about waste treatment practices at specific Federal installations were received, investigated, and answered. Sixteen requests from Congressmen for reports on installations in designated areas such as States, counties, and congressional districts were also received during 1968. Seven have been completed. The remainder will be completed by early 1970 as the first of a planned series of reports for all States.

To facilitate coordination and surveillance functions and preparation of status reports such as those mentioned above, development of a system for recording and reporting data on the waste water disposal practices at Federal installations was initiated. During 1968 approximately 5,000 case files on installations with which FWPCA has had contact were restructured. During 1969 and 1970, these records will be analysed and augmented and reduced to a computer-based system.

Technical Support

1. Technical support: Fiscal year 1969, \$3,374,000, fiscal year 1970, \$3,529,000; increase, \$155,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|---|
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +150,000 | ... | \$3,529,000 | 189 | To strengthen and expand total capabilities for providing or applying special technical advice or skills on complex and diversified water pollution problems. |
| | <u>+155,000</u> | | | | |

Need for Increase

The 1970 program must provide for additional effort in new activities initiated during 1969 and expanded 1970 efforts requiring the acquisition of additional equipment and services. Most of the requested increase in resources will be assigned to the nuclei of technical support personnel now being developed in each regional office and to the FWPCA field laboratories.

Technical support involves identifying the nature of a problem, recommending applications of known methods and techniques to solve it or, if these are not available, recommending accelerated effort through research or other means for developing appropriate solutions.

A key regional function being developed, among others, is a response capability to anticipate and minimize the adverse effects of oil and hazardous pollution discharges. To accomplish this, additional information is needed concerning the specific hazards, extent and duration of such pollution as well as the utility of remedial products or techniques. Additional labor saving, analytical equipment is needed by several regions, including the Middle Atlantic and Missouri Basin, to meet increasing State demands for assistance with major pollution problems and the implementation of water quality standards. Such semi-automated equipment permits maximum utilization of existing staff.

New and expanding problem areas where technical support requirements are increasing and need immediate attention include evaluation and control of water pollution from municipal and industrial wastes, analysis and evaluation of the pollutional characteristics of agricultural wastes in surface runoff and irrigation drainage, eutrophication studies and evaluation of the effects of all these various water pollution characteristics on the economic, natural and aesthetic aspects of water quality.

Requests for support or assistance in these and other areas from other FWPCA programs, other Federal agencies, State and local communities and others concerned have increased and continue to do so as water pollution control activities accelerate on all fronts.

Objective

Section 5 of the Federal Water Pollution Control Act, as amended, provides for encouraging, cooperating with and rendering assistance to other appropriate public authorities, agencies and institutions, private agencies and institutions and individuals. The activity, therefore, is the heart of the Federal-State-

c. Technical support and services

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) Decrease (-) Over 1969</u> |
|---|---|-----------------------------|--|
| 1. Technical support..... | \$3,374,000 | \$3,750,000 | +\$376,000 |
| 2. Pollution surveillance.... | 1,928,000 | 2,600,000 | +672,000 |
| 3. Construction grants administration..... | 2,406,000 | 3,050,000 | +644,000 |
| Total..... | 7,708,000 | 9,400,000 | +1,692,000 |

1. Technical support: Fiscal year 1969, \$3,374,000; fiscal year 1970, \$3,750,000; increase, \$376,000. The increase consists of:

| | <u>Increase (+) or Decrease (-) Amount</u> | <u>Positions</u> | <u>Total Program</u> | <u>Total Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------|----------------------------|---|
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+371,000</u> | <u>+32</u> | \$3,750,000 | 221 | To strengthen and expand total capabilities for providing or applying special technical advice or skills on complex and diversified water pollution problems. |
| | <u>+376,000</u> | <u>+32</u> | | | |

Need for Increase

The 1970 program must provide both for activity deferred in 1969 due to staffing and budget constraints, and additional 1970 efforts to meet the existing and anticipated national requirements for technical support. Most of the requested increase for resources will be assigned to the nuclei of technical support personnel now being developed in each regional office and to the FWPCA field laboratories.

Technical support involves identifying the nature of a problem, recommending applications of known methods and techniques to solve it or, if these are not available recommending accelerated effort through research or other means for developing appropriate solutions.

New and expanding problem areas where technical support requirements are increasing and need immediate attention include thermal pollution control, evaluation and control of water pollution from municipal and industrial wastes, evaluation of bacteriological pollution and effects on recreation waters, analysis and evaluation of the pollutional characteristics of agricultural wastes in surface runoff and irrigation drainage, eutrophication studies and evaluation of the effects of all these various water pollution characteristics on the economic, natural and aesthetic aspects of water quality.

Requests for support or assistance in these and other areas from other FWPCA programs, other Federal agencies, State and local communities and others concerned are and continue to increase as water pollution control activity accelerates on all fronts. Although the existing and proposed resources will not adequately meet all essential support requirements the increase in staffing will enable FWPCA to cope with many of the most serious and complex pollution problems. Most of the staff increase will be assigned to augment and strengthen the nuclei of technical

regional-local cooperative approach to water pollution control problems. Activities range from responding to letters, which in many cases concern only minor, isolated instances of pollution, to carrying out major project investigations requiring several years study.

Expert consultations and field investigations, as necessary to meet the pressing needs of States and others, are provided relative to specific local and regional water pollution problems by regional offices, field laboratories, the Robert A. Taft Sanitary Engineering Center, and the headquarters staff.

In contrast to the research activities at the field laboratories, where the basic objective is to develop new and broader understandings concerning a problem area, technical support and assistance investigations emphasize the application of existing knowledge to solve specific problems. Technical support primarily involves identifying the nature of the problem, recommending application of known methods and techniques to solve it, or, if these are not available, recommending acceleration of efforts through research or other means for developing the appropriate methods that will provide solutions. Although the primary objective is not to develop new understandings of the basic relationships involved, such understandings may sometimes result as a by-product.

Program of Work

The regional offices will expand their resources for providing on-the-spot assistance and consultation. The technical support staff in these offices and associated field stations and laboratories must be able to respond quickly and efficiently in providing the solution of existing or imminent water pollution problems on location in the areas serviced by the laboratories. For example, the State of Florida requested the Southeast Water Laboratory at Athens, Georgia, to perform studies on the nutrient problem in Lake Apopka; the North Atlantic Water Quality Management Center at Edison, New Jersey, is presently evaluating the effectiveness of chlorination for bacterial control in Jamaica Bay at the request of the State of New York; and the Robert S. Kerr Water Research Center at Ada, Oklahoma, has been requested by the State agencies of Oklahoma concerned with water pollution and by two affected municipalities to study taste and odor problems at Fort Gibson Reservoir.

Technical support plays a vital role in enforcement, comprehensive planning, control of pollution from Federal activities and other FWPCA programs. To the extent that these technical needs can be predetermined, they are included in the budget requests for those activities. Frequently, however, unanticipated needs arise in administering FWPCA programs which call for the application of special technical skills. All FWPCA technical support resources are managed cohesively at the regional level, in concert with other FWPCA programs to provide the most effective possible resource for combating pollution.

The hazard of oil and other pollution spill emergencies is a continuing problem, reflected not only by occasional, dramatically large discharges but also in the cumulative effects of numerous lesser, spills from a variety of sources. Item: More than 2,000 oil spillages are reported each year. Regional Contingency Plans for coping with spills of oil or other hazardous substances are being developed with FWPCA as the lead agency in fulfillment of the National Multiagency Oil and Hazardous Materials Contingency Plan. Regional pollution emergency centers are being established to aid in the coordination of the Federal, State and local agencies in providing prompt and comprehensive assistance to minimize the pejorative effects of such discharges. These centers are a primary FWPCA regional contact regarding pollution effects of such discharges on receiving waters.

support personnel now in each regional office and field laboratories.

Objective

Section 5 of the Federal Water Pollution Control Act, as amended, provides for encouraging, cooperating with and rendering assistance to other appropriate public authorities, agencies and institutions, private agencies and institutions and individuals. The activity, therefore, is the heart of the Federal-State-regional-local cooperative approach to water pollution control problems. Activities range from responding to letters, which in many cases concern only minor, isolated instances of pollution, to carrying out major project investigations requiring several years study.

Expert consultations and field investigations, as necessary to meet the pressing needs of States and others, are provided relative to specific local and regional water pollution problems by regional offices, field laboratories, the Robert A. Taft Sanitary Engineering Center, and the headquarters staff.

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Thermal pollution of the Nation's waters is becoming more critical as population and industry grow. The anticipated proliferation of nuclear powered electrical generation installations with their attendant need for large volumes of cooling water, and the continued expansion of industry with a like need for disposal of hot wastes, have increased the need for a clearer understanding of the effects of heated discharges on receiving waters. Technical support activities in this area are under way on the Columbia River.

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The standards of water quality now being implemented for interstate and navigable surface waters will probably encourage industries and others to consider subsurface disposal of liquid wastes. As yet, we do not have adequate knowledge of the potential effects on subsurface aquifers. Much more study of this means of disposal is needed, as illustrated by the Hammermill Bond Company at Erie, Pennsylvania, which used subsurface disposal for some of its more noxious wastes rather than discharge these wastes to Lake Erie. The deep well disposal was used for years until a soil rupture resulted in the wastes pumped into the wells being forced back to the surface and into the surface waters. A clearer understanding also must be gained concerning agricultural surface and subsurface drainage, their effects on receiving waters and possible methods for mitigating these effects. Examples include: The salinity problem caused by irrigation return flows in the Colorado River; pesticide runoff problems in areas such as the Lower Mississippi; and eutrophication problems in areas such as Klamath Lake.

In these and other areas, technical support investigations must not only undertake an assessment of pollution effects but must identify and evaluate remedial measures and equipment which will most efficiently and effectively meet the requirements of each pollution challenge.

Two additional areas of primary concern to FWPCA include the hazards of oil and other pollution spill emergencies and vessel pollution. The Administration has taken the lead in giving this technical assistance to Federal, State and local agencies in developing adequate contingency planning and operations within the framework of existing legislation to meet pollution spill emergencies.

Accomplishments

Recent accomplishments in the area of technical support are illustrated by the following projects:

Hawaiian Sugar Waste Study

An oceanic study designed to analyze and evaluate the effects that sugar mill wastes have on marine environment. This study was initiated in fall of 1967, and the final series of ocean surveys were completed in the first quarter of 1969. The data obtained in the surveys are being analyzed and evaluated for inclusion in a report now in preparation.

San Diego Bay Studies

This project was designed to determine type and quantity of waste discharges and associated pollution from watercraft, vessels and municipal waste disposal in bay waters. Initial studies of this major naval harbor were initiated in January 1967. A report currently is being reviewed for final publication.

Buffalo Lake Project, Randall County, Texas

A bacteriological study of Buffalo Lake and its tributaries, Tierra Blanca Creek and Frio Draw, was made to determine bacterial levels in dry and wet weather and to identify the sources of such contamination. Initiated April 29, 1968, the final report is in draft form. This is a portion of a cooperative study requested by Texas.

James River Project, Springfield, Missouri

A study was undertaken to determine the causes of poor water quality resulting from discharge of low quality groundwater following periods of rainfall. The study was requested by the State of Missouri and the U.S. National Park Service (Wilson's Creek Battlefield National Park). It was initiated in March of 1968. Field studies and evaluations have been completed and the final report is now being prepared.

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Lake Apopka Project, Florida

A study to characterize bottom sediments and selected nitrogen and phosphorus sources associated with a eutrophication problem in Lake Apopka. Initiated in March of 1968. Field, laboratory and data evaluation portions have been completed and the final report is being distributed.

Hillsborough - Tampa Bays Project, Florida

A study to evaluate causes and corrective measures for recurring odor problems encountered in the Hillsborough-Tampa Bays area. Initiated in May of 1967. Majority of field work is completed with present efforts devoted to data evaluation and preparation of a report. The final report is anticipated in May of 1969.

Piscataway Creek Investigations

A study to determine the effects of sewage discharges on the lower Piscataway Creek and adjacent portions of the Potomac River, and for development of corrective measures. The study and preparation of a report were completed in the fall of 1968. Recommendations for improvements in the operation of the Piscataway Sewage Treatment Plant of the Washington Suburban Sanitation Commission have been implemented.

Pollution Surveillance

SECTION TAB

2. Pollution surveillance: Fiscal year 1969, \$1,928,000; fiscal year 1970, \$3,133,000; increase, \$1,205,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$2,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +600,000 | ... | \$600,000 | ... | To provide for contractual services and equipment purchase to organize the data base for a use/criteria system covering priority interstate waterways. |
| (3) | +103,000 | +12 | 2,533,000 | 146 | To support employment in the operation of the new use/criteria system. |
| (4) | <u>+500,000</u> | <u>...</u> | ... | ... | To reimburse USGS for the conduct of water quality monitoring in support of pollution control activities. |
| | <u>+1,205,000</u> | <u>+12</u> | | | |

Need for Increase

The pollution surveillance program of FWPCA involves the planning, developing and coordinating required in the collection, evaluation and dissemination of water pollution control and water quality data vital to the implementation and enforcement of water quality standards and to meet day-to-day requirements for Federal, State and local purposes.

There has been a substantial investment in the development and implementation of water quality standards. To protect that investment we must be able to evaluate past experience, make timely decisions with regard to current situations, and evaluate alternatives based on future forecasts. In the final analysis, progress or failure of the combined State/Federal water pollution control effort will be measured by the presence or absence of desired levels of quality consistent with current and desired uses of the Nation's waterways.

The requested increase includes resources needed to finish the design and to initiate the operation of a computerized system that will permit continuous evaluation of actual water quality versus water quality criteria and associated uses, or identified in the standards. When fully implemented, this system will enable us to make decisions for not only the Nation in aggregate, but also for regions, States, river basins, stream reaches and individual communities on a current basis. Such a system is essential to the development and implementation of comprehensive basin programs involving estimates of eventual cost, establishment of priorities, and the resultant administration of program grant and municipal waste treatment construction grant programs. The increase also includes \$500,000 to be transferred to the USGS to expand Federal water quality monitoring activities at priority locations throughout the Nation.

Three broad categories of technical information are essential to the FWPCA program on a point-by-point basis. The first category includes specific information covering the status (in-place or needed) and effectiveness (efficiency)

2. Pollution surveillance: Fiscal year 1969, \$1, 928,000; fiscal year 1970, \$2,600,000; increase, \$672,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$2,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +670,000 | +17 | \$2,600,000 | 151 | To support employment of new personnel required to implement surveillance system plans, process and evaluate data obtained from this activity, initiate industrial waste inventory, and reimburse USGS for the conduct of water quality monitoring in support of pollution control activities. |
| | <u>+672,000</u> | <u>+17</u> | | | |

Need for Increase

The pollution surveillance program of FWPCA involves the planning, developing and coordination required in the collection, evaluation and dissemination of water pollution control and water quality data vital to the implementation and enforcement of water quality standards and to meet day-to-day requirements for Federal, State and local purposes. The increase includes \$500,000 which is to be transferred to U. S. Geological Survey and \$170,000 and 17 positions to support program expansion within FWPCA. The increase is necessary to provide for expansion or initiation of several activities as identified below. This program must be capable of supporting routine activities as well as a variety of technical assistance requests from State and interstate agencies on the one hand, or enforcement activities if a State fails to implement water quality standards.

Three broad categories of technical information are essential to the FWPCA program on a point-by-point basis. The first category includes specific information covering the status (in-place or needed) and effectiveness (efficiency) of waste treatment and control facilities (municipal, industrial and Federal), current and desired future water uses, and pollution caused problems. The second category, economic data associated with construction activities, is necessary to convert needed waste treatment and control facilities statistics into realistic cost estimates, as required by law, on an annual basis. The third category, water quality data, is the ultimate quantitative check on pollution control progress on a day-to-day basis. Water quality data are essential to define compliance with water quality standards and to identify emerging pollution trends so that they may be traced to the source as quickly as possible for corrective action. This requires development and application of new technologies related to collection, analysis and processing of requisite information.

Consistent with the above categories, the proposed increase is for the following purposes:

(a) Increased support of water quality monitoring systems - Additional support services are necessary to provide for long-term monitoring of water quality at selected locations to determine water quality trends and the status of compliance with water quality standards. Through a transfer of funds, most of these increased services will be obtained from the U.S. Geological Survey. Of the funds to be transferred, it is expected that 25 percent will be spent on new stations and 75

of waste treatment and control facilities (municipal, industrial and Federal), current and desired future water uses, and pollution caused problems. The second category, economic data associated with construction activities, is necessary to convert needed waste treatment and control facilities statistics into realistic cost estimates, as required by law, on an annual basis. The third category, water quality data, is the ultimate quantitative check on pollution control progress on a day-to-day basis. Water quality data are essential to define compliance with water quality standards and to identify emerging pollution trends so that they may be traced to the source as quickly as possible for corrective action. This requires development and application of new technologies related to collection, analysis and processing of requisite information.

Consistent with the above categories, the proposed increase is for the following purposes:

(a) Development and application of a water quality standards use/criteria system - Water quality standards have been established for the interstate waterways, associated with 50 States, three territories and the District of Columbia. Thus, specific waste treatment or control facilities to be built according to stipulated construction schedules with the objective of attaining selected water quality goals consistent with specific water uses are now or soon will be available for most of the United States. As noted below, it is now necessary to increase water quality monitoring activities to measure the effectiveness of waste treatment and control works relative to the restoration and enhancement of quality in the Nation's streams. Thus, it is also essential that an automated system be concurrently developed to permit timely comparisons of resultant quality data with the prescribed water quality criteria and uses contained within the standards.

The 1970 budget includes additional resources to expedite the development and application of a computerized use/criteria sub-system and its integration with existing STORET processing capabilities related to water quality data and water pollution control information. During 1970, emphasis will be placed on completing the development of the basic sub-system, and initiating operations for the Great Lakes Basin, and the mainstems of the Ohio, Columbia, Missouri, Colorado, and Mississippi Rivers by June 30, 1970. The use/criteria data base for the remaining interstate waterways including the Atlantic, Pacific, and Gulf coasts will then be entered into the system in 1971.

The most costly portion of the 1970 task will be accomplished by purchase of contractual services based upon computerized systems which are now in the final stages of development. Contractors will use automated procedures to establish river mileage coding for water-use zones specified in State standards and for waste discharge points and monitoring locations. The use-zones and related data will then be merged with abatement works construction schedules and water quality criteria by FWPCA personnel. The dynamic system will operate via the Department's IBM 360/65 telecommunications network providing continuous entry of new data and information and readily available compliance evaluations at regional offices, laboratories and Washington headquarters on a current basis.

(b) Increased support of water quality monitoring systems - Additional support services are necessary to provide for long-term monitoring of water quality at selected locations to determine water quality trends and the status of compliance with water quality standards. Through a transfer of funds, most of these increased services will be obtained from the U.S. Geological Survey in accordance with the July 18, 1968, memorandum of agreement to the Under Secretary of the Interior from the Director, USGS and Commissioner, FWPCA. Of the funds to be transferred, it is expected that 25 percent will be spent on new stations and 75 percent will be spent on increasing parameter coverage and sampling frequencies at existing USGS monitoring stations located at points of key interest to FWPCA. Thus, approximately 150 to 200 monitoring stations will be added to

percent will be spent on increasing parameter coverage and sampling frequencies at existing USGS monitoring stations located at points of key interest to FWPCA. Thus, approximately 150 to 200 monitoring stations will be added to about 400 Federal and 600 State long-term stations that will be providing requisite information on water quality by the end of 1969. A minimum of 2,400 stations will be needed by the end of 1974 (in addition to several thousand State operated stations) in order to fully evaluate compliance with interstate water quality standards.

(b) Expand capability for processing data - The increased volume of technical information being gathered and evaluated on a day-to-day basis, including water uses and criteria, requires that each region, in addition to headquarters, have ready access to and make full use of the central computer (U.S. Department of the Interior computer in Washington, D.C.). This requires the operation of at least one terminal in each region.

(c) Initiate an industrial waste treatment and control facility inventory - Up to now, no in-depth inventory has been made of industrial waste treatment facilities. In order to have an effective national water pollution control program, this inventory is essential and is expected to be underway in 1970. In this connection, it will also be required to increase and expand the Storage and Retrieval System (STORET) Computer Program to cope with these new data requirements.

Objective

The objective of water quality surveillance is to provide a system whereby technical pollution information and water quality data are collected, evaluated, and disseminated for use within FWPCA, particularly as these data relate to the enforcement and implementation of water quality standards, the effectiveness of waste treatment and control facilities, the establishment of water quality trends, and to the planning and management programs. Concurrently, full coordination with State regulatory bodies and other Federal water data collection agencies, including USGS, will assist all responsible parties to fulfill the national goal for water pollution control.

The program provides systems to satisfy continuing technical data needs and to furnish information support to all programs in FWPCA. These support services include computerized storage, retrieval and evaluation of municipal and industrial waste facilities statistics, and water quality data.

Program of Work

To meet new circumstances and needs associated with water quality standards and specific problems at individual locations within a State, basin, or on a national basis, the program will pursue the following work during 1970.

1. The maintenance of up-to-date inventory indicating the status of 15,000 municipal waste treatment and control facilities, including specific, scheduled construction needs, as identified in water quality standards implementation plans and State program grant applications.
2. Based on procedures developed during 1969, the basic industrial waste water inventory will be started during 1970. This first effort will seek to establish the status and effectiveness of existing waste handling facilities at about 6,000 manufacturing plants in the United States. In addition, industrial waste treatment and control needs, taken from implementation plans and grant applications, will be maintained on a current basis.
3. The operation of critical interstate monitoring stations in coordination with other Federal and State agencies will be expanded to approximately 1,200 stations. Further, based on a definitive planning study (in progress), a refined assessment of ultimate water quality monitoring activities will be made in

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3. The operation of critical interstate monitoring stations in coordination with other Federal and State agencies will be expanded to approximately 1,200 stations. Further, based on a definitive planning study (in progress), a refined assessment of ultimate water quality monitoring activities will be made in coordination with State water pollution control agencies. High priority stations will be established as part of the orderly growth of necessary basin monitoring activities.
4. The analytical quality control program, including the selection, adoption, and use of certified agencies' methods and techniques will be strengthened within FWPCA. Further, coordination with other agencies at the local, State and Federal level will be expanded. Data from the laboratories of the State and other Federal agencies used in support of water quality standards must be comparable among themselves. The personnel at the Cincinnati laboratory will guide this program and operate the interlaboratory quality control program.

5. FWPCA regions will forge a coordinated water pollution control monitoring program at the basin level in concert with State water pollution control agencies and the USGS. The Cincinnati activity will stress development of new specialized analytical techniques and provide back-up support to the regions, particularly with respect to industrial pollutants, including petroleum materials, and the many new synthetic organic compounds and radio-chemicals produced by the chemical industry and used widely throughout the United States.

6. The STORET system for the computerized storage, processing and evaluation of water pollution control information, water quality information and standards will be operated and expanded to provide responsive technical service within FWPCA and assistance to the States. The system is currently operational with respect to municipal waste treatment facilities and implementation schedules as well as water quality data. Thus, computer storage of the water uses and criteria contained in the standards will be initiated during 1970. This will permit continuous comparisons of actual water quality data by comparison with the uses and criteria identified in the standards. In addition, hydrologic coding procedures will be automated to facilitate the storage and evaluation of these data.

Accomplishments

Pollution control information - The municipal waste facilities inventory has been updated as of January 1, 1968, and the data entered into the STORET system. As a result, we know the facilities in-place and needed. A plan and standard form were developed to conduct an industrial wastes facilities inventory which was submitted to the Bureau of the Budget for approval. Monthly and annual summaries of bond sales and construction awards were published relating to construction of municipal sewage treatment facilities. The annual summary of pollution-caused fish kills was also published.

Water quality information - The first step in the design of a coordinated State/Federal basin monitoring system is scheduled for completion this fiscal year. As a result, immediate and long range monitoring requirements will be defined in support of water quality standards, establishment of baselines, and planning and management programs. The agency-wide analytical quality control program was initiated for the purpose of evaluating the validity of all water quality data used by FWPCA. Improved working relationships with other Federal water data collection agencies and inter-agencies were established.

STORET computer applications - The municipal and industrial implementation plans (as listed in water quality standards and State program plans) have been computerized and entered in the STORET system to facilitate measures of progress. Agreement has been reached with the USGS whereby all surface water quality data collected by them will be entered in the STORET system on a continuing basis. The system was expanded to provide for random storage and retrieval capability with stored data on line with telecommunications capability at headquarters, Edison, New Jersey; Cincinnati, Ohio; Chicago, Illinois; Kansas City, Missouri; Dallas, Texas; Ada, Oklahoma; Portland, Oregon; and Alameda, California. Data from 19,000 stations have been stored in the system by Federal, State and interstate agencies.

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Construction grants administration

3. Construction grants administration: Fiscal year 1969, \$2,406,000; fiscal year 1970, \$2,698,000; increase, \$292,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | |
|-----|-------------------------------------|------------------|----------------|------------------|---|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | <u>Explanation</u> |
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+287,000</u> | <u>+29</u> | \$2,698,000 | 266 | For support of administration of grants for waste treatment works construction. |
| | <u>+292,000</u> | <u>+29</u> | | | |

Need for Increase

An increase of \$287,000 and 29 positions is requested to handle the increased work load resulting from recent amendments to the Federal Water Pollution Control Act and to perform an adequate job of safeguarding the Federal interests.

The 1966 Amendments provide for reimbursement for the construction of any treatment works initiated after June 30, 1966. All communities undertaking construction of a waste treatment facility are permitted to submit applications for Federal grants in anticipation of reimbursement of the applicable percentage from future appropriations. Each such reimbursement project is administered in the same manner as projects for which Federal funds are available to make preconstruction grants.

Another of the provisions of the Clean Water Restoration Act of 1966 was the removal of grant dollar limitations for all projects on which construction is started after July 1, 1967. This is stimulating larger cities to begin construction of needed sewage treatment facilities and is resulting in larger, more complex projects. These projects actually require more staff time for processing and administration because of their scope and complexity.

Under present conditions, the staff is insufficient to make the necessary number of field inspections of projects during the period of construction. As the Government's investment becomes larger and as larger more complex plants are constructed, the maintenance of an adequate inspection schedule is essential in order to protect the Government's interest in this activity.

In addition, the staff is inadequate to provide operation and maintenance inspections at all completed projects. On those projects where limited inspections are made, adequate staff is not available to bring about needed improvements and other necessary changes.

During this coming fiscal year, it is planned to expand the operation and maintenance program as well as the other engineering aspects of construction grants' operations. The overall engineering program will include the evaluation of current criteria and practices for the design, operation and maintenance of waste treatment works. It is planned to develop as well as promote the development of new and improved criteria and practices where needed. There is an urgent need for establishing and maintaining a system which will provide a continuing exchange of information with the field on needed changes and new applications of knowledge in these areas. The effort will include the establishing and maintenance of close relationships with State and local agencies, consulting engineers, contractors and others concerned with design, construction, operation and maintenance of waste treatment works.

To enable this activity to meet at least minimum program requirements, additional staffing is essential.

3. Construction grants administration: Fiscal year 1969, \$2,406,000; fiscal year 1970, \$3,050,000; increase, \$644,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|---|
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+639,000</u> | <u>+70</u> | \$3,050,000 | 267 | For support of administration of grants for waste treatment works construction. |
| | <u>+644,000</u> | <u>+70</u> | | | |

Need for Increase

An increase of \$639,000 and 70 positions is requested to handle the increased work load resulting from recent amendments to the Federal Water Pollution Control Act and to perform an adequate job of safeguarding the Federal interests.

The 1966 Amendments provide for reimbursement for the construction of any treatment works initiated after June 30, 1966. All communities undertaking construction of a waste treatment facility are permitted to submit applications for Federal grants in anticipation of reimbursement of the applicable percentage from future appropriations. Each such reimbursement project is administered in the same manner as projects for which Federal funds are available to make preconstruction grants.

Another of the provisions of the Clean Water Restoration Act of 1966 was the removal of grant dollar limitations for all projects on which construction is started after July 1, 1967. This is stimulating larger cities to begin construction of needed sewage treatment facilities and is resulting in larger, more complex projects. These projects actually require more staff time for processing and administration because of their scope and complexity.

Under present conditions, the staff is insufficient to make the necessary number of field inspections of projects during the period of construction. As the Government's investment becomes larger and as larger more complex plants are constructed, the maintenance of an adequate inspection schedule is essential in order to protect the Government's interest in this activity.

In addition, the staff is inadequate to provide operation and maintenance inspections at all completed projects. On those projects where limited inspections are made, adequate staff is not available to bring about needed improvements and other necessary changes.

During this coming fiscal year, it is planned to expand the operation and maintenance program as well as the other engineering aspects of construction grants' operations. The overall engineering program will include the evaluation of current criteria and practices for the design, operation and maintenance of waste treatment works. It is planned to develop as well as promote the development of new and improved criteria and practices where needed. There is an urgent need for establishing and maintaining a system which will provide a continuing exchange of information with the field on needed changes and new applications of knowledge in these areas. The effort will include the establishing and maintenance of close relationships with State and local agencies, consulting engineers, contractors and others concerned with design, construction, operation and maintenance of waste treatment works.

To enable this activity to fully meet all program requirements, additional staffing is essential.

Objective

The primary responsibilities of this activity are to stimulate and support maximum levels of waste treatment works construction possible within the budgetary limitations, to encourage improved waste treatment plant operation and the highest possible level of treatment efficiency, and to stimulate improved design of waste treatment works for more economical and effective types of treatment in order to help reach the FWPCA goal of attaining the desired water quality levels specified by the water quality standards implementation plans.

Program of Work and Accomplishment

Administration of the program includes reviewing and processing applications, making grant offers, reviewing plans and specifications, authorizing bid advertising, reviewing bids and approving award of contracts, periodically inspecting construction, processing and approving grant payments, conducting performance audits, and fulfilling collateral responsibilities relating to programs dealing with prevailing wage, anti-kickback, contract work hours standards and civil rights requirements. In addition to the administration of grants under the Federal Water Pollution Control Act, as amended, this program has the added responsibility of reviewing and certifying the adequacy of treatment for all the sewer loans and grants awarded by the Economic Development Administration and the Department of Housing and Urban Development.

Sewage treatment plant and sewer construction costs indices will be constantly reexamined and updated to reflect existing costing conditions so that more accurate estimates can be made of construction monies needed to bring about the control and abatement of water pollution problems.

Operation and maintenance data will be analyzed and made available to communities, consulting engineers and industrial firms for use in improving the design of equipment and plants and modifying operating practices so that sewage treatment facilities can be operated as close to maximum efficiency as possible.

Emphasis will be placed on design standards to evaluate present design criteria and practices and keep abreast of new developments and trends; to define and keep abreast of knowledge gaps in design, operations, and maintenance, and channel such information to research programs for development of new solutions; and to cooperate in the development of personnel training programs to upgrade the staffing of these plants and to assure the utilization of new and improved operation and maintenance practices.

The validity and applicability of project cost data needed to upgrade competencies for estimating and projecting future program requirements will be improved through expanding research into the component costs of sewage treatment plants and sewers (i.e., population, type of treatment, loading, etc.), and through automating the great volume of collected design analysis and cost data.

Work load statistics are as follows:

| | 1968 | 1969 | 1970 |
|---|---------------|-----------------|-----------------|
| | <u>Actual</u> | <u>Estimate</u> | <u>Estimate</u> |
| Active projects at start of fiscal year | 2,031 | 2,464 | 2,819 |
| Projects under construction | (1,083) | (1,350) | (1,540) |
| Projects not under construction | (948) | (1,114) | (1,279) |
| Work load during fiscal year | | | |
| Applications reviewed | 1,095 | 1,165 | 1,340 |
| Plans and specifications reviewed | 1,041 | 1,100 | 1,200 |
| Construction starts | 866 | 1,000 | 1,150 |
| Inspections | 1,530 | 1,500 | 4,200 |
| Plants completed | 599 | 810 | 1,030 |
| Performance audits | 229 | 300 | 400 |
| Sewer certifications | 547 | 750 | 750 |

Training

d. Training

| | FY 1969 Amount <u>Available</u> | FY 1970 Estimate | Increase (+) Decrease (-) <u>Over 1969</u> |
|---|---------------------------------------|---------------------|--|
| 1. <u>Grants</u> | | | |
| (a) Training..... | \$3,400,000 | \$4,020,000 | +\$620,000 |
| (b) Research fellowships..... | 600,000 | 600,000 | ... |
| 2. <u>Federal operations</u> | | | |
| (a) Manpower development and training..... | 804,000 | 1,006,000 | +202,000 |
| (b) Graduate and special training..... | 258,000 | 258,000 | ... |
| Total..... | 5,062,000 | 5,884,000 | +822,000 |
| <u>General</u> | | | |

A prerequisite for success in the national water pollution control effort is the availability of adequate numbers of trained personnel. Increased activity continues in waste treatment works construction, research and development, planning, technical support, and similar endeavors at all levels of government and industry. However, the effective use of these public and private funds is heavily dependent upon the availability of skilled motivated individuals, from treatment plant operators to engineers and research scientists.

The manpower development and training programs of FWPCA will assist in attracting and preparing new professionals, technicians, and operators and will help prepare existing personnel for more responsible positions.

Such an effort will do much to ensure a satisfactory return on the public's investment in the clean water program.

The report, "Manpower and Training Needs in Water Pollution Control" (Senate Document No. 49, 90th Congress, 1st Session), submitted to the Congress by FWPCA, estimated the total manpower then involved in water pollution control (professionals, technicians, and treatment plant operators for public and private agencies) at about 45,000 persons. The objectives of the FWPCA training programs are to encourage, cooperate with and assist appropriate agencies, institutions and individuals in the conduct of specialized training relating to the cause, control and prevention of water pollution. The programs are designed to provide adequately trained and motivated professional and subprofessional manpower for scientific, administrative and technical positions in the water pollution control field.

To meet these identified needs, FWPCA is pursuing a number of approaches. Each is discussed below.

d. Training

| | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) Decrease (-) Over 1969</u> |
|---|---|-----------------------------|--|
| 1. <u>Grants</u> | | | |
| (a) Training..... | \$3,400,000 | \$3,980,000 | +\$580,000 |
| (b) Research fellowships..... | 600,000 | 600,000 | ... |
| 2. <u>Federal operations</u> | | | |
| (a) Manpower development and training..... | 804,000 | 1,006,000 | +202,000 |
| (b) Graduate and special training..... | 258,000 | 258,000 | ... |
| Total..... | 5,062,000 | 5,844,000 | +782,000 |

General

A prerequisite for success in the national water pollution control effort is the availability of adequate numbers of trained personnel. Increased activity continues in waste treatment works construction, research and development, planning, technical support, and similar endeavors at all levels of government and industry. However, the effective use of these public and private funds is heavily dependent upon the availability of skilled motivated individuals, from treatment plant operators to engineers and research scientists.

The manpower development and training programs of FWPCA will assist in attracting and preparing new professionals, technicians, and operators and will help prepare existing personnel for more responsible positions.

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To meet these identified needs, FWPCA is pursuing a number of approaches. Each is discussed below.

1. Grants

(a) Training: Fiscal year 1969, \$3,400,000; fiscal year 1970, \$3,980,000; increase, \$580,000.

| | FY 1969 Amount <u>Available</u> | | FY 1970 Estimate | | Increase (+) Decrease (-) Over 1969 | |
|--------------------|---------------------------------------|---------------|---------------------|---------------|---|---------------|
| | <u>No.</u> | <u>Amount</u> | <u>No.</u> | <u>Amount</u> | <u>No.</u> | <u>Amount</u> |
| Continuations..... | 77 | \$3,400,000 | 77 | \$3,815,000 | ... | +\$415,000 |
| New.. | ... | ... | 4 | 165,000 | +4 | +165,000 |
| Total..... | 77 | 3,400,000 | 81 | 3,980,000 | +4 | +580,000 |

The increase consists of:

| | <u>Increase (+)</u> <u>Amount</u> | <u>Decrease (-)</u> <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--------------------------------------|---|--------------------------------|----------------------------------|---|
| (1) | +\$415,000 | ... | \$3,815,000 | ... | To fund continuation of training grants made in prior years, with increased trainees per grant. |
| (2) | +165,000 | ... | 165,000 | ... | To support four new training grants. |
| | <u>+580,000</u> | <u>...</u> | | | |

Need for Increase

An additional \$415,000 is required to support the continuation and the expansion of existing grants made in prior years.

With the modest increase proposed, greater emphasis will be placed on expanding existing grants, wherever feasible, rather than funding significant numbers of new ones. With the additional increase of only 12.2 percent more than the amount programmed during 1969 these ongoing projects will be able to support the participation of nearly 700 trainees or 40 percent more than the number involved in 1969. This magnitude of increase in trainee participation with limited funding can be achieved because faculty, equipment and curriculum development costs have been met in previous years or already included in the 1969 base. The number of trainees per project will increase from an average of about seven in 1969 to nearly 10 in 1970.

Four new training grants are also proposed to be funded at a cost of about \$165,000. Quite obviously since the number proposed is very limited in comparison with need, grant awards will be made on a highly selective basis, to increase the numbers of professionals and technicians in the most critical areas of need in the water pollution control field.

Objective

Under Section 5(a)(2) of the Federal Water Pollution Control Act, as amended, authorization is given for the award of grants-in-aid to public and private agencies and institutions for training projects.

Technical training grants

This program, inaugurated in 1968, was designed to increase the subprofessional manpower resource, engineering aides, scientific technicians and waste treatment operators. The grants were envisioned as devices to develop a variety of training techniques for a number of training markets rather than to support large volume training of subprofessionals. Because of fiscal limitations, it is unlikely that any new awards will be made in 1969 or 1970. Continued support of two made in 1968 is planned. Because of the urgent need for such training, FWPCA must accelerate its efforts in getting other interested Federal and State training programs involved.

Accomplishments

In 1968, 84 training grants, of which 72 were for professional training, were awarded to 69 institutions in 40 states. The professional grants provide support for 500 trainees currently in 1969. Eight new grants were awarded, 36 awards were continuations of grants ordinarily initially awarded within the previous four years, and 28 were renewals of programs initiated five or more years previously. It is within this latter group that the greatest proportionate expansion has been and can be expected in future years. Ordinarily, it is also within this group that the greatest return of graduates for the training dollar can be expected, since the initial capital investment and slow development of new programs occurs in the first five years. An illustration of the effect of this is the fact that the average number of trainees per grant was about six in 1968, and is expected to rise to about seven in 1969 and nearly 10 in 1970.

Two hundred twenty-eight trainees supported by funds awarded in 1967 received advanced degrees at the M.S. and Ph.D. level in 1968. Twenty-seven percent took positions in Federal, State and local government, 23 percent in industry and consulting engineers, 9 percent in teaching and/or research in universities, seven percent in military service, and 34 percent continued their education toward a higher degree.

The following are examples of professional training grant awards:

North Carolina State University, Raleigh, North Carolina
Dr. Charles M. Smallwood, Department of Civil Engineering
"Industrial Waste Control and Abatement"

Utah State University, Logan, Utah
Norman B. Jones, Department of Civil Engineering
"Interdisciplinary Training Program in Water Quality"

Technical training grants were awarded for a variety of experimental programs permitting flexibility of subsequent policy development. Examination of the results of these grants will enable us to support tested approaches to training when funds become available.

The following are examples of technical training grant awards:

Georgia State College, Atlanta, Georgia
Dr. Fred K. Parrish
"Identification of Pollution Important Organisms"

Charles County Community College, La Plata, Maryland
Mrs. Belva L. Jensen, Department of Environmental Engineering Technology
"Water Pollution Control Technician Curriculum Development"

(b) Research fellowships: Fiscal year 1969, \$600,000; fiscal year 1970, \$600,000; no change.

| | FY 1969 Amount Available | | FY 1970 Estimate | | Increase (+) Decrease (-) Over 1969 | |
|--------------------|--------------------------------|-----------|---------------------|-----------|---|-----------|
| | No. | Amount | No. | Amount | No. | Amount |
| Continuations..... | 43 | \$249,900 | 51 | \$307,000 | +8 | +\$57,100 |
| New..... | 58 | 350,100 | 51 | 293,000 | -7 | -\$57,100 |
| Total..... | 101 | 600,000 | 102 | 600,000 | +1 | ... |

Objective

Under Section 5(a)(4) of the Federal Water Pollution Control Act, as amended, authorization is given to the Secretary to establish and maintain research fellowships in the Department of the Interior with such stipends and allowances, including traveling and subsistence expenses, as he may deem necessary to procure the assistance of the most promising research fellowships: Provided, that the Secretary shall report annually to the Appropriation Committees of Congress on these operations.

The mission of this program is to increase the number of scientists and engineers qualified to conduct independent research and advanced practice in water pollution control problems.

Research fellowships are awarded to individuals for specialized graduate and postgraduate research training in water pollution control. Research fellowships support the intensive training of students in many physical and biological disciplines and in fields of engineering. These awards provide funds for institutional costs of education, stipends for fellows, and allowances for supplies.

Any increase in size of the professional training grants program must rest heavily on the substantial and rapid expansion in the number of research fellowships since most of new university professors in water pollution control are recruited from the FWPCA research fellowship program.

Program of Work

During 1969, the research fellowship program reflects a major change. Support is primarily limited to candidates for the doctoral degree. In 1970, the research fellowship program will place emphasis on support of highly qualified doctoral candidates not now ordinarily eligible for support under training grants and on program development at institutions not now receiving research fellowship awards. These institutions will be visited to stimulate participation in this Administration's research fellowship program by attracting the efforts of faculties not previously engaged in water pollution control related activity.

Accomplishments

In 1968, fellowships were awarded to 113 individuals at 48 institutions, in 28 states and four foreign countries. During the year 35 fellows supported by funds awarded in 1967, completed their programs. Twenty-eight received Ph.D. degrees, four received M.S. degrees, and two completed post doctoral studies.

Ordinarily about 75 percent of Ph.D. recipients in FWPCA supported programs go into teaching/research.

The following are examples of new research fellowships:

University of California, Berkeley, California
 Ronald A. Cordes, Department of Chemical Engineering
 "Filtration of Aqueous Effluents Carrying Emulsified Oils"

Iowa State University, Ames, Iowa
 Dale L. Bacon, Department of Civil Engineering
 "Bio-Flocculation in the Anaerobic Contact Process"

Harvard University, Cambridge, Massachusetts
 Tze-Wen Chi, Department of Civil Engineering
 "Analysis of a Wastewater Transportation System for the Penjerdel Megalopolis"

2. Federal operations

(a) Manpower development and training: Fiscal year 1969, \$804,000; fiscal year 1970, \$1,006,000; increase, \$202,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$ 1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +64,000 | ... | ... | ... | To initiate development of manpower requirements forecasting system. |
| (3) | <u>+137,000</u> | <u>+9</u> | \$1,006,000 | 54 | Strengthen and expand existing resources to accelerate training in technical and non-technical elements of programs. |
| | <u><u>+\$202,000</u></u> | <u><u>+9</u></u> | | | |

Need for Increase

An additional \$137,000 and 9 positions are proposed for staffing the regional offices, the laboratories, and headquarters to carry out the objectives and program of work outlined below. Four of these positions are required in the regional offices and laboratories to work with State and local officials to develop manpower and training programs to meet local needs. Five positions are required at headquarters to strengthen the staff of the newly established Division of Manpower and Training. The increase includes \$64,000 to initiate the development of a manpower requirements forecasting system. Such a system will provide for the systematic preparation of manpower needs data for all levels--professional, technician, and operator--taking into account the various employers--governmental units, industry and educational institutions. This needs data, when consolidated into national needs data can be compared with existing and planned training opportunities to show us whether programs need expanding or if there are gaps that need to be filled with new programs.

The success of the national water pollution control effort is closely linked to the availability of adequate numbers of trained personnel. Substantial expenditures for construction grants, research and development, technical assistance, and similar endeavors are proposed in various sections of this budget. The effective utilization of these funds, and the nature and extent of the changes they are expected to create, depend heavily on adequate staffs of skilled and motivated people, from treatment plant operator to research scientist. The FWPCA report "Manpower and Training Needs in Water Pollution Control", (Senate Document No. 49, 90th Congress, 1st Session) documents the need to substantially increase the supply of skilled manpower. The Report shows that 23,500 operators

and 10,300 technicians are presently employed at the State and local levels, and that an additional 18,500 operators and 23,200 technicians will be needed by 1972. Moreover, 11,750 operators and 5,150 technicians now on the job will require training during the same period. This produces, over the next five years, a training load of 30,250 operators and 28,350 technicians; i.e., approximately 6,000 operators and 5,600 technicians will need to be trained every year for the next five years.

The following are examples of new research fellowships:

University of California, Berkeley, California
 Ronald A. Cordes, Department of Chemical Engineering
 "Filtration of Aqueous Effluents Carrying Emulsified Oils"

Iowa State University, Ames, Iowa
 Dale L. Bacon, Department of Civil Engineering
 "Bio-Flocculation in the Anaerobic Contact Process"

Harvard University, Cambridge, Massachusetts
 Tze-Wen Chi, Department of Civil Engineering
 "Analysis of a Wastewater Transportation System for the
 Penjerdel Megalopolis"

2. Federal operations

(a) Manpower development and training: Fiscal year 1969, \$804,000; fiscal year 1970, \$1,006,000; increase, \$202,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+201,000</u> | <u>+15</u> | \$1,006,000 | 60 | Strengthen and expand existing resources to accelerate training in technical and non-technical elements of programs. |
| | <u>+202,000</u> | <u>+15</u> | | | |

Need for Increase

An additional \$201,000 and 15 positions are proposed for staffing the regional offices, the laboratories, and headquarters to carry out the objectives and program of work outlined below. Nine of these positions are required in the regional offices and laboratories to work with State and local officials to develop manpower and training programs to meet local needs. Six positions are required at headquarters to strengthen the staff of the newly established Division of Manpower and Training.

The success of the national water pollution control effort is closely linked to the availability of adequate numbers of trained personnel. Substantial expenditures for construction grants, research and development, technical assistance, and similar endeavors are proposed in various sections of this budget. The effective utilization of these funds, and the nature and extent of the changes they are expected to create, depend heavily on adequate staffs of skilled and motivated people, from treatment plant operator to research scientist. The FWPCA report "Manpower and Training Needs in Water Pollution Control," (Senate Document No. 49, 90th Congress, 1st Session) documents the need to substantially increase the supply of skilled manpower. The Report shows that 23,500 operators and 10,300 technicians are presently employed at the State and local levels, and that an additional 18,500 operators and 23,200 technicians will be needed by 1972. Moreover, 11,750 operators and 5,150 technicians now on the job will require training during the same period. This produces, over the next five years, a training load of 30,250 operators and 28,350 technicians; i.e., approximately 6,000 operators and 5,600 technicians will need to be trained every year for the next five years.

Senate Document No. 49 also points out the training needs generated for professional level employees. It notes that scientists, public administrators and engineers, constituting the professional employment category, are employed in substantial numbers by Federal agencies, State agencies, municipalities and special districts, consulting engineers, and educational institutions. Professional employees are also frequently engaged in overseeing the operation of waste treatment plants for large cities, sanitary districts, and industry. State administrators, of the water pollution control agencies of the 50 States, estimate that their programs will need some 3,500 professionals by 1972. Based upon other data in this same document, and upon available information on projected new treatment plant construction, it is estimated that approximately 6,000 waste treatment plant operators and 5,600 water quality technicians need to be trained each year during the 1970-74 period.

Objective

The objectives of manpower development and training programs are to assist in attracting and preparing new professionals, technicians, and operators, to help prepare those already employed for more effective participation and more responsible positions and administer grant and research fellowship programs.

Program of Work

FWPCA conducts, or sponsors, technical training programs for the specific purpose of enhancing the abilities of personnel from all agencies concerned with the control of water pollution. Special emphasis is given to training courses or programs which assist the State and local agencies to train their personnel, and which make these agencies full partners in the water pollution control effort. In addition it administers training grant and research fellowship programs. The various approaches are discussed below.

FWPCA in-house training

Specialized and advanced technical training is offered to personnel of FWPCA and other public agencies at all levels, and to private agencies and institutions. Such training is conducted by the FWPCA training staff, located at the field laboratories, for new recruits to water pollution control as well as for experienced personnel in need of refresher courses or cross-training. Trainees are drawn from the professional, technician, and operator ranks across the Nation.

During 1970, the FWPCA in-house training program will concentrate on course offerings at the professional and technical levels, with limited, selective offerings at the operator level. The availability of funds, facilities, and instructor personnel dictate a training program that will reach those in the best position to transfer their gained knowledge to others in their sphere of influence. Also, the large number of individuals in the operator category, their geographical distribution, and the problem of time away from the job and the costs involved, among other factors, renders it unrealistic and not feasible for FWPCA to undertake mass training in FWPCA facilities of the operator force.

The in-house training curriculum includes a variety of technical courses in water quality management, of one or two weeks duration. Also offered are orientation courses and short technical seminars to meet the needs of particular Federal, State, and local agencies or academic institutions.

The training of waste treatment plant operators has traditionally been viewed as a State responsibility. FWPCA recognizes that it has a responsibility to assist the States and also recognizes that it has a role to play in the training of waste treatment plant personnel at Federal installations. Therefore, FWPCA will provide, through the use of its own training facilities and staff, selective offerings of practical courses in waste treatment plant operation, methods, and

procedures--both to operators and to personnel engaged in operator training. This will enable FWPCA to develop and test training techniques and materials which will ultimately be passed on to the States for large volume training of operators. In addition to these methods of assistance to the States, another approach to treatment plant operator training pursued by FWPCA is discussed in the following paragraphs under the heading of "Inter-Agency Resources for Technical Training."

FWPCA training personnel, in addition to preparing and presenting courses at FWPCA facilities, respond to requests for technical guidance from States, universities, and other institutions offering instruction related to water pollution control.

Interagency resources for technical training

To meet the sizeable training needs identified in Senate Document No. 49, it is both practicable and desirable for FWPCA to utilize the resources of other Federal agencies which administer manpower development and training programs, wherever the program objectives are compatible. As a first step, FWPCA became a participant in the Cooperative Area Manpower Planning System (CAMPS) during 1968. In addition, other interagency agreements are being sought by FWPCA and it is expected that at least one major contract for training will be signed and implemented during 1970. It has become a matter of course for the Division of Manpower and Training to pursue external program resources wherever practicable. Beginning in 1969, FWPCA focused attention, through the CAMPS mechanism, on the need to train large numbers of waste treatment plant operators and for the first time to foster the use of Manpower Development and Training Act of 1962 to meet a substantial part of this need. It is anticipated that most States and interstate water pollution control agencies will develop at least one project funded by the Manpower Development and Training Act, through interaction with CAMPS, by the end of 1971 and sustain such project through 1974 and beyond.

FWPCA is also exploring, with the Departments of Labor and Health, Education, and Welfare, their vocational education and manpower development programs (other than those funded under the Manpower Development and Training Act) which have potential for meeting training needs in the water pollution control field. Two or three other Federal agencies also appear to have programs which may eventually be helpful. These are being explored and will be utilized wherever possible.

On the basis of experience gained during the past 12 months, it is apparent that the manpower development and training program of FWPCA can be greatly enhanced by adding staff to the Division of Manpower and Training to develop interagency and intergovernmental programs such as those described above. This approach offers numerous advantages to all interested parties. To FWPCA and other agencies in the Federal Government it offers the opportunity to develop programs which will significantly increase the amount of trained manpower, drawn to a large extent from the ranks of the unemployed, the underemployed, and the disadvantaged. To the State and local agencies in need of such manpower, it makes available existing Federal funds and is therefore of immediate and tangible benefit.

To the extent that the resources of other Federal agencies can be utilized for the bulk training of subprofessionals during 1970 and succeeding years, FWPCA funds for technical training can be used more extensively as a catalyst to foster new and innovative approaches. Although the advantages are numerous, it must be recognized that the development of interagency and intergovernmental programs is a difficult and time consuming process. Divergent points of view must be reconciled and agreements hammered out within the framework of program guidelines which are often seemingly inflexible and restrictive. To the extent progress can be made along these lines, however, the Federal-State-local partnership is strengthened and relevant, worthwhile manpower programs can be developed. Most of the new positions requested for 1970 will be used for such purposes.

The success of the FWPCA manpower and training program will be contingent, to a large extent, upon having an adequate data base and the analytical skills to interpret and put to use the data which are developed. Therefore, as rapidly as possible, sufficient numbers of qualified staff must be added at headquarters and in the regions to develop and to implement programs. In some cases, in-house resources will have to be amplified by the use of consultants. The following work should be initiated during 1970:

(a) Development of a manpower requirements data system. There is a need to design and maintain a system to provide, on a continuing basis, a means for identifying current needs and forecasting longrange requirements for professional and nonprofessional manpower.

(b) An inventory and the development of a system for exchanging information on significant courses, curricula, techniques, and methods used for training in the water pollution control field. Such data would provide the means to avoid duplication of effort and expenditure and assist in developing manpower and training programs in a more orderly fashion.

(c) An in-depth analysis of training methods.

(d) A job and task analysis of waste treatment plant operators, in various size plants, to provide the descriptive information necessary to develop appropriate levels and types of training.

(e) Identification and analysis of the impediments to the recruitment and retention of water pollution control manpower and the development of devices which may be appropriately used at the Federal level to alleviate problems which are identified. Consideration would be given to the efficacy of career patterns for professionals, technicians, and operators, the use of apprenticeships, and mandatory certification of waste treatment plant operators.

There are a few of the areas which must be examined and where information must be developed. Additional FWPCA staffing and funds for hiring consultants will be required to conduct studies and analyses such as these. In administering the training grant and research fellowship programs FWPCA will continue to perform the following:

- (a) Assist applicants in the development of grant proposals;
- (b) Receive and review completed grant applications;
- (c) Recommend approved applications for award;
- (d) Authorize payment of funds;
- (e) Develop and apply policies and regulations;
- (f) Evaluate progress and terminal reports;
- (g) Provide statistical and scientific reports on grant programs;
- (h) Develop information on the status of training for program planning; and
- (i) Maintain liaison with the scientific community to coordinate training grant programs.

In addition, program administration will continue to expand in the following areas: review and evaluation of cost effectiveness of training grants program; stimulate project development in the areas of primary importance to FWPCA and accelerate visiting of active projects to develop information on training accomplishments not available through progress or terminal reports.

In 1970, a total of 183 training and research fellowship grants involving over \$4.5 million will be serviced and a system for continuing evaluation of program effectiveness will be put into effect.

Accomplishments

Late in 1968, a Division of Manpower and Training was established within FWPCA to bring together for the first time various related programs which had developed independently over the years without benefit of central direction. This new division is developing an integrated approach to the many facets of the manpower problem. Existing programs are being carefully scrutinized to test their relevancy and productivity. Existing needs data are being carefully scrutinized and refined and alternative ways of meeting manpower needs are being explored. As needs are more thoroughly understood and as supporting data are refined, significant changes can be expected in the mix of programs and levels of support. It is anticipated that the next five years will be a period of vastly accelerated effort and accomplishments, of shifts in program emphasis and of new dimensions.

Another facet of accomplishment is in the area of in-house training. During 1969, FWPCA will continue its training program of offering special and advanced technical courses for personnel of public agencies, as well as other appropriate persons, concerned with water pollution control. In 1968, this program consisted of 24 short courses, presented one or more times, one to two weeks duration, and had an output of 1,317 persons. The courses were conducted at five FWPCA training facilities. In 1969, 28 short courses will be offered in the five training facilities with a planned output of 1,465 persons. It is expected that Federal activities and installations will send an increasing number of their personnel to FWPCA courses.

In 1969, the program will provide for the administration of 178 grants and fellowships costing \$4.0 million as compared with 187 grants and \$3.7 million in 1968.

In 1968, an analysis of the grant and fellowship programs was undertaken in an effort to use six years of experience to guide future decisions on policy and administration. Preliminary results were sufficiently revealing to warrant the intensive analysis of each of the programs in terms of cost per graduate, by various classifications. These analyses will be correlated with field review of the various training programs in an effort to improve our training investment. Analyses in 1968 serve as the basis for future estimates of manpower needs and supply projections.

(b) Graduate and special training: Fiscal year 1969, \$258,000; fiscal year 1970, \$258,000; no change.

Objective

To provide developmental opportunity in highly specialized areas for selected technical and scientific FWPCA personnel with high potential to assist in meeting critical program staffing requirements that cannot be met through normal recruitment resources.

Selected employees are assigned to universities each year for specialized resident study at the graduate level. These assignments extend the professional competence of key personnel into other critical requirement categories. Prior to completion of the graduate training, these employees are considered for duty assignments wherein the training they have received may be fully utilized. Through this effort we will begin to develop our own competencies in the critical manpower shortage categories.

Program of Work

Graduate level training in 1970 will be considered and approved on the basis of meeting critical manpower needs of the Administration. Nominations for the long-term graduate training program will be solicited for employees ready for substantial career development and advancement whose planned graduate program is related to the needs of the Administration in staffing to meet the changes in program concept or emphasis, organization or functions. It will be designed to provide employees with demonstrated potential an opportunity to extend their professional background as engineers and scientists into other areas of critical need such as operations research and systems analysis, urban and regional resources planning, public administration, economics, and political science.

It is evident that there will be a continuing need to provide such training opportunities for carefully selected personnel to continue to develop and upgrade the competence of FWPCA's staff. The Administration is, therefore, faced with the necessity to develop its own competence in these areas by providing maximum training opportunities for selected staff.

To effectively carry out the many complex and changing programs of the Administration, it is essential that skilled personnel who are capable of developing institutional arrangements for implementing pollution control programs be available. This requires a sufficiently broad background in planning, economics and public administration. By providing scientific or professional personnel with advance training in the management field, the combination will contribute significantly to accomplishment of future program objectives.

Accomplishments

In 1966, a total of 24 candidates submitted requests for long-term graduate training to be conducted in 1967 and 15 applied in 1968. A training committee, composed of key program officials of the Administration, reviewed these requests against selected categories of training needs and recommended approval of 17 candidates for 1967, 12 in 1968 and nine in 1969.

Immediately prior to completion of their training, the training committee reviewed the graduate programs undertaken by each employee and recommended placements based on their extended academic experience. Each employee was personally interviewed by key officials in whose program area the employee's training and background were most suitable. On the basis of this personal interview and review and evaluation of background and completed training, the employees were selected for assignments in the appropriate program area.

Some examples of the program of study which were approved in fiscal year 1968 and 1969 that will greatly assist the Administration in meeting critical needs are as follows:

(a) Study of the application of operations research and systems analysis techniques to water resources engineering.

(b) Studies in waste water treatment processes, water resources chemistry and microbiology. The program of study also will include a review of water resources development including planning, hydrology, and the economic application.

(c) Studies to be pursued consist of three highly integrated components of water resource management. They include: concepts, methodology, and problems of water resources planning, development and management; chemical engineering aspects of industrial waste treatment will cover technical courses such as physical chemistry, transport phenomenon, and process design and control; research combining the two above subject areas.

(d) Studies in research in chemical engineering as applied to water pollution control and treatment processes. Also included are studies in sanitary engineering, water chemistry, and hydraulics.

(e) Studies in water resources management designed to develop a working knowledge of systems analysis and operation research as they relate to water resources systems and management; and to gain knowledge in the application of regional and comprehensive planning as it relates to water pollution control.

(f) Study of the application of mathematical techniques to water quality models, hydrology, mathematical analysis of data, and advanced waste treatment methods.

(g) Advanced training in computer technology and systems analysis for engineering and other professional or scientific personnel. Recruitment efforts have failed to produce qualified candidates to fill positions in the field of systems design, development and analysis. There is no indication that the condition of the labor market will improve during the next several years. In view of the Administration's responsibility for the far-reaching program of designing, developing, improving, testing and installing systems and techniques for the storage, retrieval, and processing of water quality, inventory, and other related data collected on streams, open bodies of water, etc., it is essential that steps be taken to produce the skills and knowledge needed.

(h) Advanced training in economics for sanitary engineers. The combination of economic and engineering skills is difficult to obtain. In spite of extensive efforts to recruit candidates with these skills in the current labor market, applicants have not been available to meet the critical needs of the organization.

Enforcement

Enforcement

| | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 compared with 1969</u> |
|----------------------------------|---|---|-----------------------------|---|
| Enforcement..... | \$3,020,578 | \$3,587,000 | \$3,700,000 | +\$113,000 |
| Unobligated balance lapsing..... | 372,422 | ... | ... | ... |
| Total..... | 3,393,000 | 3,587,000 | 3,700,000 | +113,000 |

Enforcement: Fiscal year 1969, \$3,587,000; fiscal year 1970, \$3,700,000; increase, \$113,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|---|
| (1) | +\$4,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +109,000 | +6 | \$3,700,000 | 189 | To strengthen and expand enforcement capability |
| | <u>+113,000</u> | <u>+6</u> | | | to carry out regulatory actions as needed. |

Need for Increase

The increase of \$109,000 to support six additional positions is needed to assure an effective enforcement program directed to securing effectual compliance with established water quality standards for the Nation's interstate waters and with remedial requirements schedules established under continuing enforcement actions. In this period, deadline dates for interim and final performance by municipal, industrial, and other sources of pollution will increasingly fall due. Based on intensified careful surveillance of progress toward meeting scheduled requirements, it will be determined where it is necessary to apply authorized enforcement measures in the case of recalcitrants.

Objective

The Federal enforcement authority, in accordance with Section 10 of the Federal Water Pollution Control Act, as amended, provides that measures be taken to restore the maximum number of water uses through the abatement and control of pollution of interstate or navigable waters which endangers the health or welfare of any persons; to support and cooperate with State and interstate agencies in the exercise of their enforcement authority to abate and control water pollution; to prevent and control pollution from Federal installations involved in enforcement actions; to enforce the abatement of violations of water quality standards established for interstate waters; and encourage cooperative activities by the States relating to prevention and control of water pollution, including enactment of improved State laws and compacts between States.

The Water Quality Act of 1965 extended enforcement jurisdiction to the abatement of discharges of wastes in violation of established water quality standards for interstate waters. Enforcement authority and procedures to abate pollution of interstate or navigable waters which endangers the health or welfare of any persons are invoked at State request and, under certain circumstances, on Federal responsibility and initiative without State request. Enforcement authority is accomplished in a three-stage procedure: conference, public hearing, and court action. Each successive stage is resorted to only if the previous one has not been effective. Encouragement is provided the States for obtaining compliance under their own authorities during the interim periods between successive stages.

The initial enforcement procedure--the informal conference between State and Federal authorities to explore the nature of the pollution situation, the delays encountered, and to agree, if possible, on required remedial measures and the schedule for their installation--has been notably satisfactory. It should be noted that, out of a total of 45 initiated actions held to date, (map and listing on pages 96 and 99), it has been necessary to advance to the public hearing stage in only four instances, and to only a single ultimate court action involving the City of St. Joseph, Missouri. The 45 actions have been taken in many separate geographic areas. Forty-one States and District of Columbia are parties to these actions. The actions involve approximately 1,300 municipalities, 1,300 industries,

and will affect some 11,000 miles of rivers, as well as large areas of lakes and bays. Remedial facilities built, under construction, or scheduled, as a result of agreements reached to date (Lake Michigan not included) under these actions, will total about \$10.5 billion.

The Water Quality Act of 1965 provided that the States establish water quality standards for their interstate waters or they would be otherwise federally promulgated. Violations are abatable through direct court action, except that a stipulated 180 days are afforded for obtaining voluntary compliance before active initiation of the court action. Again, every encouragement to the State authorities to obtain compliance under their own measures is provided.

In addition to the enforcement authority under the Federal Water Pollution Control Act, as amended, Section 211 of the Clean Water Restoration Act of 1966 transferred the administration of the Oil Pollution Control Act, 1924, from the Secretary of the Army to the Secretary of the Interior. This extended jurisdiction to include not only portions of the sea within the territorial jurisdiction of the United States and all inland waters navigable in fact in which the tide ebbs and flows, but to encompass all inland navigable waters. An additional requirement provides that persons discharging or permitting discharge of oil must remove it or pay costs for its removal. Violators are subject to fine or imprisonment or both.

In administering this Act, the Secretary may, with the consent of the Commandant of the Coast Guard and the Secretary of the Army, make use of their personnel, equipment, organization, and agencies and of Army Corps of Engineers, Customs, and Coast Guard personnel in its enforcement, as well as persons under his jurisdiction.

Program of Work

The national commitment to abate, prevent, and control water pollution and restore the cleanliness of our waters is expressed in its final sense through the enforcement activity. In line with administration and Congressional mandates, the enforcement authorities provided in the Federal Water Pollution Control Act, as amended, and the Oil Pollution Control Act, 1924, will be applied, when applicable, to:

- (1) abate long-standing pollution situations of a serious nature which endangers the health or welfare of any persons;
- (2) ensure compliance with established water quality standards for interstate waters; and
- (3) control and prevent the dumping or spillage of oil from boats or vessels.

It is anticipated that enforcement action will be initiated to abate pollution of interstate or navigable waters invoked at State requests or on the basis of reports, studies, or surveys indicating the need for Federal action. Voluntary compliance to institute remedial measures will be sought, where possible, where violations of water quality standards and the Oil Pollution Control Act, 1924, occur--and through court action wherever required.

In some of the areas where enforcement actions are instituted, a wide range of complex technical issues must be resolved before a schedule of abatement and control measures can be developed. Extensive on-site studies are conducted to develop the information necessary to establish a sound basis for water quality control programs in such cases, or an active post surveillance activity to assure that the measures for abating pollution are installed and are eliminating the pollution problems. The number of these situations cannot be predicted.

Accomplishments

Initial Conferences in 1968

Eastern New Jersey Shore-from Shark River to Cape May (New Jersey)

The conference was held November 1, 1967. The conferees agreed that the estuaries and tributaries of eastern New Jersey, from Shark River on the north to Cape May on the south, receive the discharge of wastes from municipal waste treatment plants, individual septic tanks and cesspools, boats and land drainage. As a result, these waters are polluted by bacteria, suspended solids and nutrients. Because of the existing or potential pollution of these waters, the State of New Jersey, under the cooperative arrangements governing the National Shellfish Sanitation Program, has closed more than 36,000 acres of water to the direct harvesting of shellfish, leaving 127,000 acres available for shellfish harvesting. These closures have caused substantial economic injury resulting from the inability to market shellfish or shellfish products in interstate commerce. The estimated economic loss to the region is at least \$1.5 million annually. The conferees agreed upon a program of remedial action.

Lake Michigan and Its Tributary Basin (Wisconsin-Illinois-Indiana-Michigan)

The conference was called by the Secretary of the Interior at the request of the Honorable Otto Kerner, Governor of Illinois, and on the basis of reports, surveys, or studies. The conference was opened on January 31, 1968. The problems affecting Lake Michigan include eutrophication, bacterial pollution, chemical pollution, oxygen depletion, electric power plants, wastes from watercraft, oil pollution, disposal of dredged material, alewives, and pesticides.

Boston Harbor and Its Tributaries (Massachusetts)

This conference, held May 20, 1968, was the fourth to be called by the Secretary under the shellfish provisions of the Act. The level of performance of the new Deer Island primary waste treatment plant, the largest and most important treatment facility in the Harbor, was considered. The conferees agreed to issue periodic status reports on the effectiveness of pollution abatement accomplished by this plant and other municipal and industrial waste contributors.

New 1969 Conference

Lake Champlain and Its Tributary Basin (New York-Vermont)

Called upon the request of the Vermont Department of Water Resources and by the Secretary of the Interior, this bi-State conference held its first session on November 13, December 19-20, 1968. The conferees paid particular attention to the problem of a New York pulp and paper mill's sludge deposits which cause pollution of Vermont's contiguous waters in the southern part of the Lake. The conferees decided to recommend that a thorough study of the sludge problem be carried out and that a technical committee study criteria for chlorination practices, bacteria counts, temperature and dissolved oxygen.

Reconvened Conferences and Progress Meetings in 1968 and 1969

In 1968 six previously initiated conferences were reconvened. These conferences concerned (1) the Colorado River (sixth session held July 26, 1967); (2) Puget Sound (second session held September 6-7, 1967); (3) the Hudson River (second session held September 20-21, 1967); (4) the Connecticut River (second session held September 27, 1967); (5) the Coosa River (second session held April 11, 1968); and (6) the Blackstone and Ten Mile Rivers (second session held May 28, 1968). Progress evaluation meetings were held concerning (1) the Calumet Rivers-Lake Michigan (September 11, 1967); (2) the Red River of the North (December 6, 1967);

(3) Moriches Bay and Eastern Section of Great South Bay (April 23, 1968); (4) the Upper Mississippi River (April 30, 1968); and (5) Lake Erie (June 4, 1968).

To date in 1969, reconvened conferences have numbered four. The areas concerned are: (1) Lake Erie (fourth session held October 4, 1968); (2) the Pearl River (second session held November 7, 1968); (3) Calumet Rivers-Lake Michigan (December 11, 1968); and (4) the Merrimack and Nashua Rivers (second session held December 18, 1968).

At present, major on-site investigations or surveillance activities, as a result of enforcement actions, are under way in seven areas.

FEDERAL WATER POLLUTION ENFORCEMENT ACTIONS

1. Corney Creek Drainage System
(Arkansas-Louisiana)
2. Big Blue River
(Nebraska-Kansas)
3. Missouri River-St. Joseph, Missouri Area
(Missouri-Kansas)
4. Missouri River-Omaha, Nebraska Area
(Nebraska-Kansas-Missouri-Iowa)
5. Potomac River-Washington Metropolitan Area
(District of Columbia-Maryland-Virginia)
6. Missouri River-Kansas City Metropolitan Area
(Kansas-Missouri)
7. Mississippi River-St. Louis Metropolitan Area
(Missouri-Illinois)
8. Animas River
(Colorado-New Mexico)
9. Missouri River-Sioux City Area
(South Dakota-Iowa-Nebraska)
10. Lower Columbia River
(Washington-Oregon)
11. Bear River
(Idaho-Wyoming-Utah)
12. Colorado River and all tributaries
(Colorado-Utah-Arizona-Nevada-California-
New Mexico-Wyoming)
13. North Fork of the Holston River
(Tennessee-Virginia)
14. Raritan Bay
(New Jersey-New York)
15. North Platte River
(Nebraska-Wyoming)
16. Puget Sound
(Washington)
17. Mississippi River-Clinton, Iowa Area
(Illinois-Iowa)
18. Detroit River
(Michigan)
19. Androscoggin River
(New Hampshire-Maine)

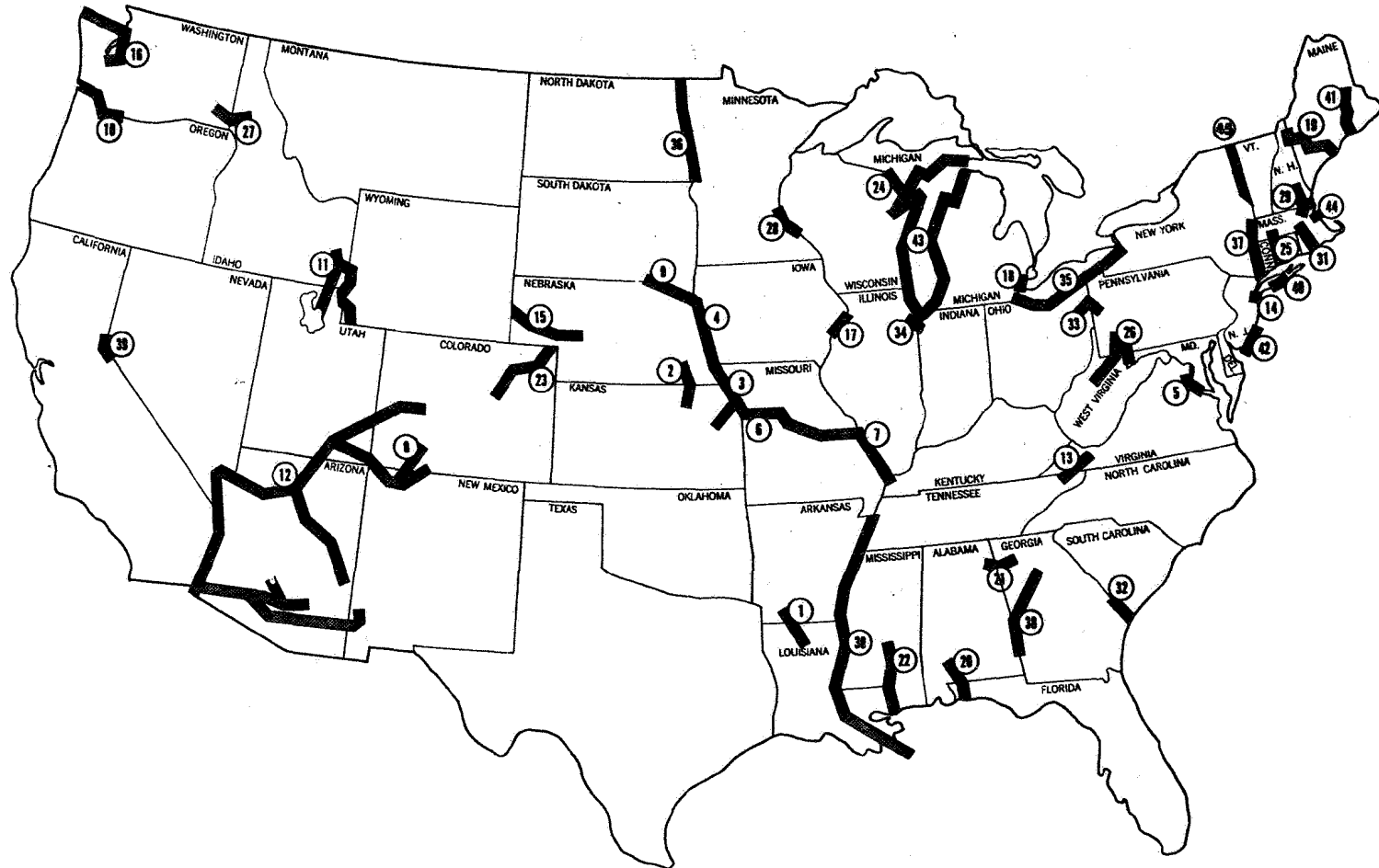
Federal Water Pollution Enforcement Actions (continued)

20. Escambia River
(Alabama-Florida)
21. Coosa River
(Georgia-Alabama)
22. Pearl River
(Mississippi-Louisiana)
23. South Platte River
(Colorado)
24. Menominee River
(Michigan-Wisconsin)
25. Lower Connecticut River
(Massachusetts-Connecticut)
26. Monongahela River
(West Virginia-Pennsylvania-Maryland)
27. Snake River-Lewiston, Idaho-Clarkston,
Washington Area
(Idaho-Washington)
28. Upper Mississippi River
(Minnesota-Wisconsin)
29. Merrimack and Nashua Rivers
(New Hampshire-Massachusetts)
30. Lower Mississippi River
(Arkansas-Tennessee-Mississippi-Louisiana)
31. Blackstone and Ten Mile Rivers
(Massachusetts-Rhode Island)
32. Lower Savannah River
(South Carolina-Georgia)
33. Mahoning River
(Ohio-Pennsylvania)
34. Grand Calumet River, Little Calumet River, Calumet River,
Wolf Lake, Lake Michigan, and their tributaries
(Illinois-Indiana)
35. Lake Erie
(Michigan-Indiana-Ohio-Pennsylvania-New York)
36. Red River of the North
(Minnesota-North Dakota)
37. Hudson River
(New York-New Jersey)
38. Chattahoochee River
(Georgia-Alabama)

Federal Water Pollution Enforcement Actions (continued)

39. Lake Tahoe
(California-Nevada)
40. Moriches Bay and Eastern Section of Great South Bay
and their tributaries
(Long Island, New York)
41. Penobscot River and Upper Penobscot Bay
and their tributaries
(Maine)
42. Eastern New Jersey Shore--from Shark River to Cape May
(New Jersey)
43. Lake Michigan and its tributary basin
(Wisconsin-Illinois-Indiana-Michigan)
44. Boston Harbor and its tributaries
(Massachusetts)
45. Lake Champlain and its tributary basin
(New York-Vermont)

Federal Water Pollution Enforcement Actions



UNITED STATES DEPARTMENT OF THE INTERIOR • FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
January 1969

Executive direction and support

Executive direction and support

| | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 compared with 1969</u> |
|--|---|---|-----------------------------|---|
| a. Direction, coordination and management support... | \$4,027,095 | \$4,606,000 | \$4,718,000 | +\$112,000 |
| b. Public information..... | 416,015 | 518,000 | 564,000 | +46,000 |
| c. Commissioned officer retirement fund..... | 349,984 | 158,000 | ... | -158,000 |
| Unobligated balance lapsing..... | 17,906 | ... | ... | ... |
| Total..... | <u>4,811,000</u> | <u>5,282,000</u> | <u>5,282,000</u> | <u>...</u> |

Executive direction and support

| | <u>FY 1968 Amount Available</u> | <u>FY 1969 Amount Available</u> | <u>FY 1970 Estimate</u> | <u>Increase (+) or Decrease (-) 1970 compared with 1969</u> |
|--|---|---|-----------------------------|---|
| a. Direction, coordination and management support... | \$4,027,095 | \$4,606,000 | \$4,678,000 | +\$72,000 |
| b. Public information..... | 416,015 | 518,000 | 604,000 | +86,000 |
| c. Commissioned officer retirement fund..... | 349,984 | 158,000 | ... | -158,000 |
| Unobligated balance lapsing..... | 17,906 | ... | ... | ... |
| Total..... | <u>4,811,000</u> | <u>5,282,000</u> | <u>5,282,000</u> | <u>...</u> |

Direction, coordination and management supoort

a. Direction, coordination and management support

| | FY 1969 Amount <u>Available</u> | FY 1970 Estimate | Increase (+) Decrease (-) <u>Over 1969</u> |
|--------------------------|---------------------------------------|---------------------|--|
| 1. Headquarters..... | \$3,111,000 | \$3,220,000 | +109,000 |
| 2. Regional offices..... | <u>1,495,000</u> | <u>1,498,000</u> | <u>+3,000</u> |
| Total..... | 4,606,000 | 4,718,000 | +112,000 |

General

Overall leadership, direction and administrative support are essential and necessary functions of any organization. These kinds of activities become particularly important for FWPCA which has been expanding and increasing its financial, manpower and facility resources.

In the past several years, FWPCA has grown from an organization of 1,936 employees as of June 30, 1966 to 2,714 on June 30, 1968; established its own regional boundaries and related offices; established administrative management support activities at headquarters and in the field; is continuing various stages of planning and/or constructing of 10 laboratory facilities; has implemented two major pieces of legislation, the Water Quality Act of 1965 and the Clean Water Restoration Act of 1966; and has realized a budget increase from \$187.0 million for 1966 to \$300.9 million in 1969. It should be noted that all of this has been accomplished during years in which stringent fiscal and manpower limitations have been in effect. FWPCA proposes to continue expanding and strengthening its programs. To provide necessary direction, coordination and administrative support for the proposed expansion in program requirements and related manpower needs both at headquarters and in the field, additional resources are required.

1. Headquarters: Fiscal year 1969, \$3,111,000; fiscal year 1970, \$3,220,000; increase, \$109,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> | <u>Total</u> | <u>Total</u> | | |
|-----|-------------------------------------|------------------|----------------|------------------|---|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | <u>Explanation</u> |
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +121,000 | +10 | \$3,095,000 | 242 | Provide administrative support to meet new and expanding program requirements. |
| (3) | <u>-17,000</u> | <u>...</u> | <u>...</u> | <u>...</u> | Nonrecurring costs of consolidating headquarters staff at Crystal Mall, Virginia. |
| | <u>+109,000</u> | <u>+10</u> | | | |

Need for Increase

Automation management

FWPCA has the responsibility to develop and implement a national plan for the control of water quality and the abatement of pollution of the waters within the United States. In order for the Administration to effectively execute its responsibilities within a rapidly changing environment, it is necessary to have all the pertinent resource data within the Administration readily available. This information is not now available at headquarters. The availability of accurate and current information pertaining to regional activities at the national level,

a. Direction, coordination and management support

| | FY 1969 Amount Available | FY 1970 Estimate | Increase (+) Decrease (-) Over 1969 |
|--------------------------|--------------------------------|---------------------|---|
| 1. Headquarters..... | \$3,111,000 | \$3,095,000 | -\$16,000 |
| 2. Regional offices..... | 1,495,000 | 1,583,000 | +88,000 |
| Total..... | 4,606,000 | 4,678,000 | +72,000 |

General

Overall leadership, direction and administrative support are essential and necessary functions of any organization. These kinds of activities become particularly important for FWPCA which has been expanding and increasing its financial, manpower and facility resources.

In the past several years, FWPCA has grown from an organization of 1,936 employees as of June 30, 1966 to 2,714 on June 30, 1968; established its own regional boundaries and related offices; established administrative management support activities at headquarters and in the field; is continuing various stages of planning and/or constructing of 10 laboratory facilities; has implemented two major pieces of legislation, the Water Quality Act of 1965 and the Clean Water Restoration Act of 1966; and has realized a budget increase from \$187.0 million for 1966 to \$300.9 million in 1969. It should be noted that all of this has been accomplished during years in which stringent fiscal and manpower limitations have been in effect. FWPCA proposes to continue expanding and strengthening its programs. To provide necessary direction, coordination and administrative support for the proposed expansion in program requirements and related manpower needs both at headquarters and in the field, additional resources are required.

1. Headquarters: Fiscal year 1969, \$3,111,000; fiscal year 1970, \$3,095,000; decrease, -\$16,000. The decrease consists of:

| | Increase (+) or Decrease (-) Amount | Positions | Total Program | Total Positions | Explanation |
|-----|--|------------|------------------|--------------------|---|
| (1) | +\$5,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +121,000 | +10 | \$3,095,000 | 242 | Provide administrative support to meet new and expanding program requirements. |
| (3) | -142,000 | ... | ... | ... | Nonrecurring costs of consolidating headquarters staff at Crystal Mall, Virginia. |
| | <u>-16,000</u> | <u>+10</u> | | | |

Need for Increase

Automation management

FWPCA has the responsibility to develop and implement a national plan for the control of water quality and the abatement of pollution of the waters within the United States. In order for the Administration to effectively execute its responsibilities within a rapidly changing environment, it is necessary to have all the pertinent resource data within the Administration readily available. This information is not now available at headquarters. The availability of accurate and current information pertaining to regional activities at the national level,

as well as at the regional level, is doubtful. However, national plans must be developed, programs budgeted for, and implementation of plans undertaken. The absence of such information makes the evaluation of regional plans, with respect to national requirements, impossible in the necessary manner.

Heretofore, computer service needs have been acquired by whatever local arrangements the user could make. However, in the past year FWPCA embarked on a program to establish a "national network" plan. This plan involves a national telecommunication network linking each data processing user, via telephone lines, with a switching center at FWPCA in Washington, D. C., which in turn is linked with the U. S. Geological Survey Computer Center, also in Washington, D. C.

The major advantages of this plan are: Relatively quick response to data processing requirements, whether project, laboratory, regional office or headquarters originated; rapid turn-around time for specific data processing assignments, such as compilations, debugging, analytical problem solving, etc.; the availability of an extremely large and fast computer configuration at minimum cost, since the tremendous amount of national work load causes lower unit costs to be achieved. Computer program development can be controlled and accomplished centrally, making standard models and other applications available nationally at significantly lower costs for program development; and finally, and most importantly, water resource data, management information, and congressional queries can be handled quickly and accurately from a central management information or data bank system.

Some of the program data requirement areas requiring attention for national or regional purposes include municipal wastes and water facility inventories, water quality data, water flow data (STORET), and water quality standards plans to evaluate pollution abatement progress, evaluation of State plans, river basin planning, data for establishing effective and realistic priority assignment for construction projects, and technical support. Automated support programs for administrative functions are also under development for personnel applications to reflect strength by skill level and location, integrated cost accounting, budgeting and project planning and control accounting to facilitate the determination of progress of and value received for the resources needed.

As an FWPCA management information system is developed, it will provide the data reflecting the use of all FWPCA resources which is vital to questions which are generated by the Congress and other government bodies. The system should be capable of being queried and providing answers in a matter of minutes from the central data bank, thereby avoiding the lost time required to poll the many regional, laboratory and project offices which is the current practice. It should further permit the rapid identification of the location and nature of such resources as personnel, equipment, property and facilities available within the Administration. This cannot currently be done without placing an additional time consuming burden upon the field activities.

In order to meet these requirements, the staff of automation management must be expanded and strengthened to ensure effective development and coordination of FWPCA-wide policies and procedures, planning acquisition, utilization and management of data processing and communications equipment and systems. In addition, the staff must also provide adequate and timely assistance and services to all elements of FWPCA, as requested, in capturing data; designing data formats; designing program logic and writing computer programs in administrative areas; testing and debugging; developing and maintaining all administrative computer applications and programs; operating and providing machine services; and developing and coordinating a program of training for improving and maintaining qualifications and skills in this field. For this purpose, the increase includes five positions and \$66,000.

Accounting operations

In 1968 a nationally centralized accounting operations activity was established in Washington, D. C., to service all FWPCA activities. Therefore, every financial transaction occurring nationally is processed, reviewed and recorded at the headquarters level. As programs and related employment expand, work load in this area increases. The following are some statistics to illustrate the magnitude of some of the work load impact which are measurable: In 1968, the first year of this operation, nearly 36,000 documents were administratively audited and processed for payments by the Treasury Department. In 1969, it is estimated that nearly 48,000 documents will be processed with nearly 57,000 estimated for 1970 with the increase primarily due to proposed program increases for 1970. Although additional staff was authorized for 1969, the employment ceiling restriction has eliminated this resource. In order to meet the increasing requirements in 1969, the staff is working a considerable amount of overtime. However, this kind of working condition is not conducive to good management practice. In order to correct the situation and enable this activity to meet the increased work load estimated for 1970, the increase includes five clerical positions and \$55,000.

Nonrecurring costs of consolidating headquarters staff at Crystal Mall, Virginia

In 1969, headquarters activities that were housed in five different locations were moved to Crystal Mall, Virginia. Although a large portion of the costs of this move were financed by other agencies, there was nearly \$142,000 of costs that had to be borne by FWPCA. To fund this need, savings were used from the \$300,000 originally appropriated for the civil service retirement fund contributions, as required by law for the Public Health Service Commissioned Officers who converted to Civil Service status. Although this amount was initially considered as non-recurring in 1970, it now develops that FWPCA will be required to transfer about \$100,045 to GSA for the cost of the space occupied in excess of the credits for the space vacated. This will be a one-time transfer to GSA and it then becomes their responsibility. An additional problem is the fact that the telephone maintenance and service costs are higher in Virginia than in Washington, D.C. Therefore, \$24,955 will be applied to offset 1970 additional costs. These are essential costs and therefore must be met. The net balance of \$17,000 is being declared as non-recurring.

Objective

Provide overall leadership, direction, coordination and administrative management support to facilitate attainment of FWPCA program missions. The functions supported at headquarters under this activity include the following:

- Office of the Commissioner
- Office of Program Coordination
- Water Pollution Control Advisory Board
- Office of Administration
 - (a) Office of Assistant Commissioner
 - (b) Office of Management Analysis
 - (c) Office of Equal Employment and Opportunity
 - (d) Personnel Management
 - (e) Financial Management
 - (f) General Services
 - (g) Facilities Management
 - (h) Automation Management

Program of Work

Continue providing overall leadership and direction, establish policies, plans, regulations and directives as needed. Continue expanding and strengthening the quantification of agency output objectives to make possible more incisive and far-reaching program analysis and reviews. Provide guidance, coordination and direction, and, where applicable, provide services to headquarters and field program activities.

Accomplishments

In 1968 and 1969 to date considerable amount of effort was devoted by top management in the review and approval process of water quality standards, oil pollution contingency plans, new legislative proposals, program review and reporting systems and the reorganization of headquarters and regional offices.

During 1968 and to date in 1969, increased attention was given to refining the administrative management support operations at both headquarters and the field. Fiscal management operations were transferred from the Department of Health, Education and Welfare and became the full responsibility of FWPCA. A total personnel management program encompassing goals and objectives was implemented which

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gives recognition to the need for self evaluation, training and utilization of the work force, career planning, equal employment opportunity, automation of personnel systems, effective employee-management communications. In the field of automation, there were many scientific, technical and administrative applications implemented in whole or in part. These applications will become the base for an integrated management information system to meet current data needs and for long-range planning purposes.

Increased work loads and accelerated activities took place in the number of procurement actions, particularly related to research and development contracts.

Also, increased activity has been focused on the provisions of Executive Order 11246 vested in the Secretary of Labor for promoting and insuring of equal employment opportunity on government contracts and federally assisted construction contracts. The Department of Labor regulations outline significant levels of effort to be expended in implementing this program nationwide. FWPCA has been required to participate in a number of preaward conferences when federally assisted construction contracts in excess of \$1 million were involved. In addition, such contracts must be continuously monitored to insure compliance.

FWPCA is also in the process, through a contractual arrangement of having a study conducted for the purpose of developing standards and principles of an integrated PPB and accounting information system. The House Government Operations Committee insisted that all agencies accelerate their efforts to develop and implement such a system to the extent feasible with the approval of GAO. These standards and principles are anticipated to be completed in early March and submitted for appropriate approvals. The next step is the design and installation of the system which will be a high priority project including the development of applicable policies, procedures and operating instructions. A combination of outside assistance and the limited capabilities available in financial management will be utilized to accomplish this effort, hopefully, early in 1970.

During January 1969, all FWPCA headquarters personnel were moved to Crystal Mall, Arlington, Virginia. This action brought under one roof, for the first time since 1966, all Washington area headquarters personnel which prior to the move were housed in five different locations in Washington. This consolidation eliminated many operating problems that were encountered under such conditions. Headquarters operating effectiveness should increase under the present arrangement.

2. Regional offices: Fiscal year 1969, \$1,495,000; fiscal year 1970, \$1,498,000; increase, \$3,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> | | <u>Total</u> | <u>Total</u> | |
|-----|-------------------------------------|------------------|----------------|------------------|------------------------------|
| | <u>Amount</u> | <u>Positions</u> | <u>Program</u> | <u>Positions</u> | <u>Explanation</u> |
| (1) | +\$3,000 | ... | ... | ... | To meet increased pay costs. |

Objective

Regional directors represent the Commissioner and their objective, therefore, is to provide leadership, supervision, coordination and administrative management support for all program activities under their jurisdiction.

Program of Work and Accomplishments

This program includes carrying out and, when necessary, interpreting policies of the Administration and supervision, conduct and coordination of assigned programs, activities and projects. New and expanded program activities in the past few years are placing a tremendous demand on the regional organization. Considerable amount of emphasis is and will continue to be placed on developing a more effective Federal, State and local cooperative approach for water pollution control.

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2. Regional offices: Fiscal year 1969, \$1,495,000; fiscal year 1970, \$1,583,000; increase, \$88,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|---|
| (1) | +\$3,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+85,000</u> | <u>+9</u> | \$1,583,000 | 123 | To provide additional clerical support. |
| | <u>+88,000</u> | <u>+9</u> | | | |
| | | | <u>Need for Increase</u> | | |

The work load of administrative support activities in the regional offices continues to grow. Since the establishment of regional offices several years ago, the management support activities which include personnel management, financial management (excluding accounting) and general services, staffing has been constrained due to personnel limitations.

To compound the situation, additional staffing authorized for 1969 has been deferred because of new employment restrictions. Every effort will be made to meet at least essential and minimal support requirements. However, this situation

Progress in implementing the State water quality standard plans will be critically watched; monitoring of water quality through joint Federal-State efforts to assure compliance to standards will be strengthened; formulation of local institutional arrangements for the development of water pollution action programs for river basins will be accelerated; technical support to States and local communities and others for solving specific pollution problems will be expanded; and assistance to other Federal agencies to solve their pollution problems will be extended. This increased activity places additional demands on the regional directors and will require considerable amount of coordination and supervision and effective and timely administrative support.

cannot continue in 1970 without seriously affecting the programs. The regional administrative staff provides support in varying degrees to programs located in the nine regional offices, seven major laboratory facilities and 32 other field offices or facilities. These offices and laboratories are located in 32 different States.

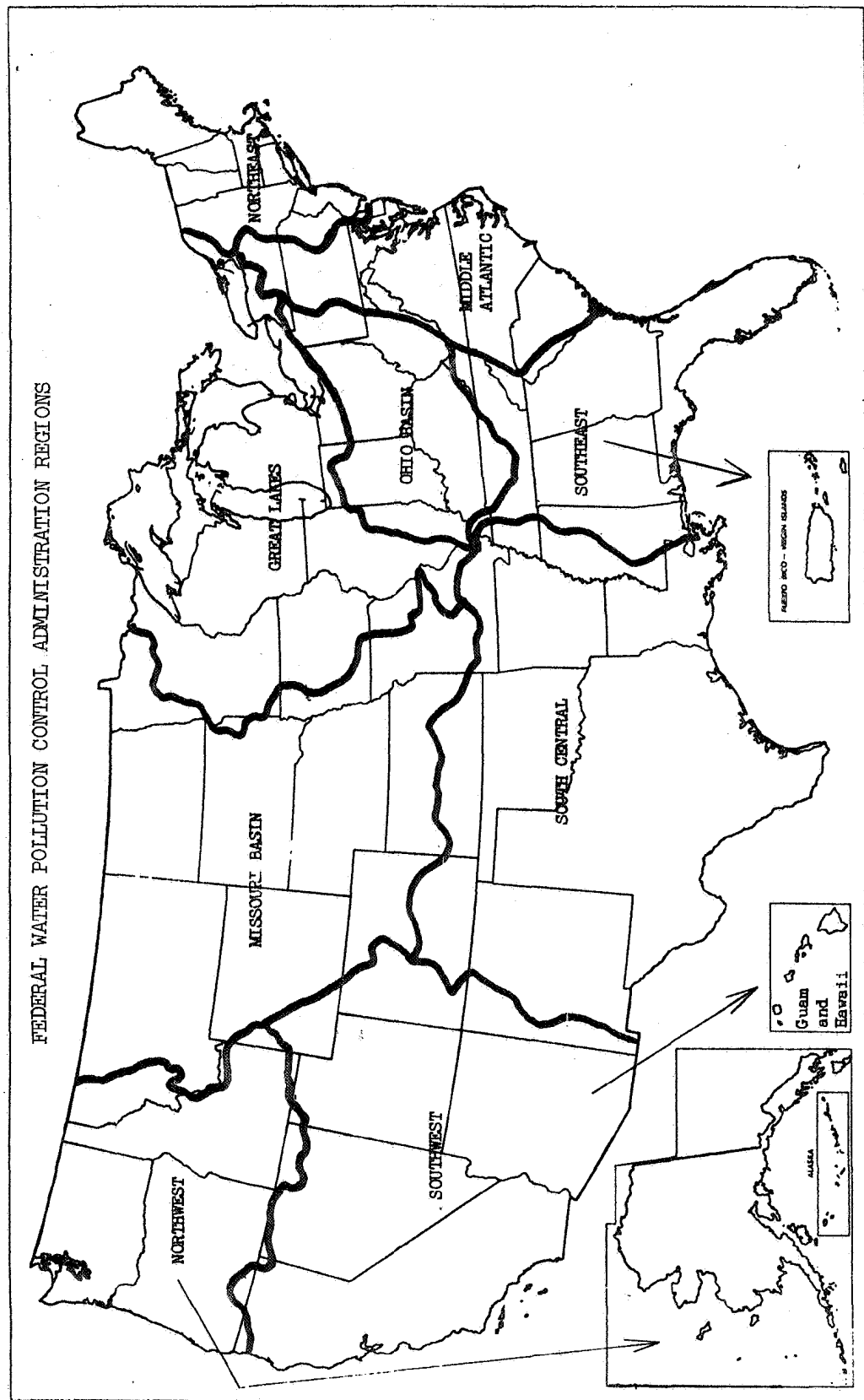
Serving and supporting programs and personnel in all FWPCA locations creates more than the normal rate of problems that would be encountered if they were located in or adjacent to the regional office. They are not insurmountable, however, if adequate staff is available. Therefore, to enable effective support for existing personnel and programs and for the additional program field staff proposed for 1970, an increase of nine positions and \$85,000 is requested.

Objective

Regional directors represent the Commissioner and their objective, therefore, is to provide leadership, supervision, coordination and administrative management support for all program activities under their jurisdiction.

Program of Work and Accomplishments

This program includes carrying out and, when necessary, interpreting policies of the Administration and supervision, conduct and coordination of assigned programs, activities and projects. New and expanded program activities in the past few years are placing a tremendous demand on the regional organization. Considerable amount of emphasis is and will continue to be placed on developing a more effective Federal, State and local cooperative approach for water pollution control. Progress in implementing the State water quality standard plans will be critically watched; monitoring of water quality through joint Federal-State efforts to assure compliance to standards will be strengthened; formulation of local institutional arrangements for the development of water pollution action programs for river basins will be accelerated; technical support to States and local communities and others for solving specific pollution problems will be expanded; and assistance to other Federal agencies to solve their pollution problems will be extended. This increased activity places additional demands on the regional directors and will require considerable amount of coordination and supervision and effective and timely administrative support.



Public Information

b. Public information: Fiscal year 1969, \$518,000; fiscal year 1970, \$564,000; increase \$46,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|---|
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | <u>+\$45,000</u> | <u>...</u> | \$564,000 | 30 | Provide additional material capability for national direction and dissemination of information. |
| | <u>+46,000</u> | <u>...</u> | | | |

Need for Increase

\$45,000 is requested to strengthen overall coordination and guidance of FWPCA's public information programs by providing increased emphasis to the area of visual aids.

The battle against water pollution will never be won without ardent and continuing public support. Fortunately, public opinion polls show that the American people are already aware of the water pollution problem. However, many other important issues are competing for the public's attention, such as the war in Viet Nam, crime in the streets, the war on poverty, civil rights, the struggle for better schools and the battle against air pollution. In the clamor to provide support for these worthy causes, the voices of those calling for clean water may go largely unheard.

Since the public has been hearing about water pollution for years and knows of no river anywhere in America that has actually been restored, its interest in this subject may well finally begin to waver. Especially when the citizen discovers the staggering cost of cleaning up a river, is he likely to become disheartened.

Existing resources are inadequate to effectively meet this challenge. The regional information officer is responsible for organizing, planning, and directing FWPCA's public information program within his region. He prepares speeches, special statements, press releases, and related material on a continuing basis. These offices are the source of information concerning missions and programs of FWPCA for the general public, special interest groups, and the information media--press, radio, television, and magazines. An increased visual aids program will do much to assist our personnel in providing these services.

If the public information office is to be an effective management tool in reporting on water pollution problems and the efforts and achievements made by FWPCA's expanding and complex programs, these additional resources are necessary.

Objective

The basic objective of the Office of Public Information, both at headquarters and in the field, is to put the facts about water pollution and water pollution prevention and control on the public record, and to provide information in such form as to be most useful to groups, organizations, and individuals whose cooperation is essential to the success of the entire program. The first part of this objective serves the public's right to know what FWPCA is doing and trying to do about water pollution. The second part serves the public's need to know how the

b. Public information: Fiscal year 1969, \$518,000; fiscal year 1970, \$604,000; increase \$86,000. The increase consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$1,000 | ... | ... | ... | To meet increased pay costs. |
| (2) | +85,000 | +6 | \$604,000 | 36 | Provide additional professional and material capability for national direction and dissemination of information and secretarial support for regional information officers. |
| | <u>+86,000</u> | <u>+6</u> | | | |

Need for Increase

Six additional positions and \$85,000 are requested to strengthen overall coordination and guidance of FWPCA's public information programs, give increased emphasis to the area of visual aids, alleviate the broad range of an increasing work load in the area of scientific and technical information services and provide for the urgent need of secretarial staff for regional public information officers.

The battle against water pollution will never be won without ardent and continuing public support. Fortunately, public opinion polls show that the American people are already aware of the water pollution problem. However, many other important issues are competing for the public's attention, such as the war in Viet Nam, crime in the streets, the war on poverty, civil rights, the struggle for better schools and the battle against air pollution. In the clamor to provide support for these worthy causes, the voices of those calling for clean water may go largely unheard.

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Existing resources are inadequate to effectively meet this challenge. Therefore, the increase includes one professional and one secretary for headquarters, and urgently needed secretarial staff in the regional offices. The regional information officer is responsible for organizing, planning, and directing FWPCA's public information program within his region. He prepares speeches, special statements, press releases, and related material on a continuing basis. These offices are the source of information concerning missions and programs of FWPCA for the general public, special interest groups, and the information media--press, radio, television, and magazines.

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water pollution control program works in order to participate effectively in the program at State and local levels.

Program of Work

The program of work of the Office of Public Information for 1970 will place increased emphasis on how water pollution can be controlled. This will serve the dual purpose of maintaining public awareness of the fact that water pollution can be controlled, the dominant initial theme of the FWPCA information program, and helping to channel widespread public interest into effective action against all forms of water pollution.

Accomplishments

FWPCA's Office of Public Information won the 1968 "Thoth" award, which is the Washington Chapter of the Public Relations Society of America's Oscar for excellence.

The Public Information Office received the award for professional excellence in the government category. It was in recognition of the FWPCA's total information program, including press relations, radio and television campaigns, publications and presentations and speech and article writing.

Two TV spots and 18 radio spots were produced during FY 1969 and distributed to stations throughout the country. They have been widely acclaimed by stations and broadcasting publications.

For example, Lawrence Laurent, radio and television columnist for the Washington Post, wrote in a review of the FWPCA TV spots, "I attended a preview yesterday of two of the one-minute TV messages and each is excellent."

Here are some comments from radio stations about the radio spots produced by FWPCA's Office of Public Information:

Clem Candelaria, program manager, KTVT, Fort Worth, Texas; "I have just received two public service spots in regard to water pollution that were mailed to us. I want to take this opportunity to tell you how impressed I am with the quality and message content of the spots."

Adrian L. White, KPOC, Pocahontas, Arkansas; "Excellent production. Entertaining and informative."

Jay Merrick, WNFL, Green Bay, Wisconsin; "One word describes the material--excellent."

Greg Scott, KANE, New Iberia, Louisiana; "Very good and to the point."

Lee Roberts, KBOL, Boulder, Colorado; "I think they are well done, catchy spots. They should get the message across."

Past TV and radio spots have helped keep the volume of mail addressed to "Clean Water" at 1,000 a month and the new spots are expected to boost this flow of mail.

Phone inquiries from the press have risen to about 225 a week and personal visits by correspondents to about 30 a week. Extensive research and editorial assistance was given to LIFE magazine for a picture layout and editorial on the Great Lakes, and in other special water pollution control campaigns around the country. During the last 12 months 112 press releases on various developments were issued, 52 weekly round-up releases on construction grants, 52 issues of Water Pollution NEWS, and 52 weekly reports on newsworthy developments to the Assistant Secretary for Water Quality and Research were also issued.

The Office of Public Information produced a variety of speeches and special articles for the Secretary, the Assistant Secretary, and the Commissioner. In the graphics area one general purpose exhibit and 15 table top exhibits on varying subjects are now being designed. A new booklet "Showdown--for Water" has been printed and is now being distributed. Also, we are working on a poster campaign for distribution nationally; a series of leaflets on water quality standards, lakes, estuaries, thermal pollution, and acid mine drainage; and are cooperating on the production of an estuary film.

In addition to letters addressed to "Clean Water," a large volume of mail requiring individual responses, many of which involve considerable research for proper handling, is received. The number of such letters reached nearly 300 for each of the past 12 months and is expected to continue at the same rate.

Office of Public Information provided extensive editorial and writing assistance in the preparation of nearly 300 scientific and technical papers and a number of special reports.

Commissioner Officers retirement fund

c. Commissioned officer retirement fund: Fiscal year 1969, \$158,000; fiscal year 1970, ...; decrease, \$158,000. The decrease consists of:

| <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|--|------------------|--------------------------------|----------------------------------|--|
| <u>-\$158,000</u> | <u>...</u> | ... | ... | Due to nonrecurring payment to the civil service retirement fund for each Public Health Service commissioned officer converting to civil service status. |

Purpose

The Water Quality Act of 1965, which established the Federal Water Pollution Control Administration, had a special provision with respect to Public Health Service commissioned officers when employed with the program who decided to resign their commission and transfer to civil service status.

In addition to other inducements for retaining these professionals, the Federal Water Pollution Control Act, as amended, provided that funds would be deposited to the credit of the civil service retirement fund on behalf of and to the credit of each transferring officer in an amount equal to that which the individual would be required to deposit in this fund to cover the years of service credited to him. The Federal Water Pollution Control Act, as amended, also provided that funds would be deposited within two years after the date of an officer's transfer.

Funding for this purpose was completed in 1969.

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Pollution Control Operations and Research

| | Actual 1968 | Estimate 1969 | Estimate 1970 | Increase (+) Decrease (-) |
|--|----------------|------------------|------------------|------------------------------|
| <u>Program and Financing</u> | | | | |
| Total obligations..... | \$82,880,835 | \$108,110,001 | \$93,851,000 | -\$14,259,001 |
| Comparative transfer from other accounts..... | -11,875,906 | ... | ... | ... |
| Transfer to: | | | | |
| "Operating expenses, Public Buildings Service," General Service Administration..... | 218,305 | 114,154 | ... | -114,154 |
| "Salaries and expenses, Office of the Solicitor"..... | 144,000 | ... | ... | ... |
| "Salaries and expenses, Office of Oil and Gas"..... | 23,000 | ... | ... | ... |
| "Salaries and expenses, Office of the Secretary"..... | 233,000 | ... | ... | ... |
| Proposed transfer to other accounts for pay increases..... | ... | 1,874,000 | ... | -1,874,000 |
| Transferred from "Construction Grants for Waste Treatment Works"..... | ... | -4,334,306 | ... | +4,334,306 |
| Unobligated balance brought forward..... | ... | -18,804,849 | -1,879,000 | +16,925,849 |
| Unobligated balance carried forward..... | 18,804,849 | 1,879,000 | ... | -1,879,000 |
| Unobligated balance lapsing..... | 2,371,917 | ... | ... | ... |
| Appropriation..... | 92,800,000 | 88,838,000 | 91,972,000 | +3,134,000 |
| <u>Obligations by objects:</u> | | | | |
| 11 Personnel compensation..... | 21,897,206 | 24,353,000 | 24,988,000 | +635,000 |
| 12 Personnel benefits..... | 2,061,000 | 1,866,000 | 1,766,000 | -100,000 |
| 21 Travel and transportation of persons..... | 1,700,559 | 1,838,000 | 1,914,000 | +76,000 |
| 22 Transportation of things..... | 183,050 | 296,000 | 310,000 | +14,000 |
| 23 Rent, communications and utilities..... | 1,502,092 | 1,898,000 | 2,099,000 | +201,000 |
| 24 Printing and reproduction..... | 448,516 | 596,001 | 608,000 | +11,999 |
| 25 Other services..... | 13,380,303 | 20,560,000 | 17,991,000 | -2,569,000 |
| 26 Supplies and materials..... | 1,617,545 | 1,792,000 | 1,819,000 | +27,000 |
| 31 Equipment..... | 1,593,304 | 963,000 | 1,386,000 | +423,000 |
| 32 Lands and structures..... | 49,269 | 50,000 | 50,000 | ... |
| 41 Grants, subsidies and contributions..... | 38,446,366 | 53,898,000 | 40,920,000 | -12,978,000 |
| 42 Insurance claims and indemnities..... | 1,625 | ... | ... | ... |
| Total obligations..... | 82,880,835 | 108,110,001 | 93,851,000 | -14,259,001 |

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Pollution Control Operations and Research

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| <u>Program and Financing</u> | | | | |
| Total obligations..... | \$82,880,835 | \$108,110,001 | \$93,851,000 | -\$14,259,001 |
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| Unobligated balance lapsing..... | 2,371,917 | ... | ... | ... |
| Appropriation..... | 92,800,000 | 88,838,000 | 91,972,000 | +3,134,000 |
| <u>Obligations by objects:</u> | | | | |
| 11 Personnel compensation..... | 21,897,206 | 24,353,000 | 25,769,000 | +1,416,000 |
| 12 Personnel benefits..... | 2,061,000 | 1,866,000 | 1,824,000 | -42,000 |
| 21 Travel and transportation of persons..... | 1,700,559 | 1,838,000 | 2,003,000 | +165,000 |
| 22 Transportation of things..... | 183,050 | 296,000 | 328,000 | +32,000 |
| 23 Rent, communications and utilities..... | 1,502,092 | 1,898,000 | 2,069,000 | +171,000 |
| 24 Printing and reproduction..... | 448,516 | 596,001 | 619,000 | +22,999 |
| 25 Other services..... | 13,380,303 | 20,560,000 | 17,225,000 | -3,335,000 |
| 26 Supplies and materials..... | 1,617,545 | 1,792,000 | 1,854,000 | +62,000 |
| 31 Equipment..... | 1,593,304 | 963,000 | 1,230,000 | +267,000 |
| 32 Lands and structures..... | 49,269 | 50,000 | 50,000 | ... |
| 41 Grants, subsidies and contributions..... | 38,446,366 | 53,898,000 | 40,880,000 | -13,018,000 |
| 42 Insurance claims and indemnities..... | 1,625 | ... | ... | ... |
| Total obligations..... | 82,880,835 | 108,110,001 | 93,851,000 | -14,259,001 |

Buildings & Facilities

DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Buildings and Facilities

| | |
|---|---------------------|
| Appropriation 1969..... | ... |
| Unobligated balance from prior years..... | <u>\$11,672,140</u> |
| Total available for obligation..... | 11,672,140 |
| <u>Decreases:</u> | |
| Water pollution control and water quality standards laboratories..... | <u>-3,379,069</u> |
| Subtotal and total available for obligation..... | 8,293,071 |
| Less: Unobligated balance from 1969..... | <u>-8,293,071</u> |
| Budget estimate 1970..... | <u>...</u> |

Buildings and Facilities

Analysis by Activities

| | Amount Available 1969 | Estimated Total Available | Fiscal Year 1970 | | Total available 1970 compared to total avail- able 1969 | Page Ref. |
|--|-----------------------------|---------------------------------|-------------------------------------|--------------------|--|--------------|
| | | | Unobligated Balance from 1969 | Budget Estimate | | |
| 1. Water pollution control and water quality standards laboratories..... | \$10,604,052 | \$8,024,983 | \$7,224,983 | +\$800,000 | -\$2,579,069 | 114 |
| 2. Field evaluations..... | 1,068,088 | 268,088 | 1,068,088 | -800,000 | -800,000 | 116 |
| Total..... | <u>11,672,140</u> | <u>8,293,071</u> | <u>8,293,071</u> | ... | <u>-3,379,069</u> | |

1. Water pollution control and water quality standards laboratories: Fiscal year 1969, ...; fiscal year 1970, ...; no change. Although no new funds are requested in 1970, it is proposed that \$800,000 be reprogrammed from funds appropriated in prior years. The reprogramming consists of:

| | <u>Increase (+) or Decrease (-)</u> <u>Amount</u> | <u>Positions</u> | <u>Total</u> <u>Program</u> | <u>Total</u> <u>Positions</u> | <u>Explanation</u> |
|-----|--|------------------|--------------------------------|----------------------------------|--|
| (1) | +\$250,000 | ... | \$250,000 | ... | Land acquisition and planning costs for a regional water pollution control facility in the Southwest Pacific area. |
| (2) | +550,000 | ... | 550,000 | ... | Repairs and improvement requirements for existing laboratory facilities. |
| | <u>+800,000</u> | <u>...</u> | | | |

Need for Increase

Planning

The \$250,000 proposed for this purpose will be used to acquire land at a nominal cost and prepare plans and specifications for a regional water pollution control facility in the Southwest Pacific area. A regional facility with laboratory capabilities is needed to solve the problems peculiar to the Southwest Pacific, a water-short region of explosive population and industrial growth--the center of the irrigated agriculture-industry in which waste water reclamation and reuse are of critical importance. This is the last major area in the country which does not have a major laboratory capability either constructed or in some stage of planning. The area to be served covers California, Colorado River Basin, Great Basin and Hawaii, and includes nearly 15 percent or 557 thousand square miles of the Nation's total land area and 11 percent of the Nation's population or nearly 19 million people (based on the 1960 census). A recent projection by the Water Resources Council indicates that by 1980 the population in this area will be in excess of 32 million. Notwithstanding the existing water shortage problem, unless an aggressive and effective waste water reclamation and reuse program is instituted, the water and related pollution problem will become more acute.

Therefore, it is essential and necessary that FWPCA construct a facility with adequate laboratory capability to facilitate carrying out programs and activities for solving existing problems and developing plans and techniques for meeting head-on problems envisioned in the future.

The regional facility laboratory will be utilized for the conduct of research, investigations, experiments, field demonstrations and studies, and training relating to the prevention and control of water pollution, including the control and treatment of irrigation return flows, the development of new and improved methods for waste water purification and reuse, the determination of fate and persistence of pollutants disposed of in the ocean and their ecological effects, and the study of methods for the ultimate disposal of concentrated pollutants removed from wastes by treatment, as well as specific problems associated with mining and processing of radioactive ores, processing of oil-bearing shales, and reclamation of mine tailings, pollution of harbors by boats and ships as at San Diego and San Francisco, discharges from food processing operations in the Central and Imperial Valleys of California and in Central Arizona, and maintenance of water quality associated with interbasin transfer of water.

In addition to carrying out programs requiring laboratory facilities, it is proposed to include adequate office space to house existing regional office operations. This multipurpose arrangement will lead to a better integration of programs with a subsequent reduction in communication problems, travel costs,

support costs, and a more effective utilization of research and laboratory results, etc. Such a multipurpose facility will greatly accelerate the solving of water pollution problems in the Southwest Pacific area.

Because of the magnitude of the problem and related manpower needs plus special research and training facility requirements, a facility involving about 100 thousand gross square feet is proposed. Construction and special equipment requirements are estimated to cost between \$6 and \$7 million. Based on all aspects of this project proceeding under normal conditions, the multipurpose facility would be available for occupancy in the late summer or early fall of calendar year 1972.

Repairs and improvements

The \$550,000 is required for alterations, repairs and improvements to existing laboratories for the following purposes:

a. Storage facilities are needed for chemicals and acid and gas cylinders for the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, and the Alaska Water Laboratory, College, Alaska. Currently, these items are being stored in the main laboratory facility which creates a safety hazard and takes up laboratory space which could be more effectively and efficiently used for other program purposes. The estimated cost for these two facilities is \$115,000.

b. Other requirements are needed to improve maintenance, correct operating deficiencies and make minor renovations. Included are environmental control modifications, a sprinkler system, and fencing at Ada, Oklahoma; air conditioning system changes, painting, equipment repair shop, and a sprinkler system at Athens, Georgia; elevator repairs, emergency power and auxiliary boiler studies, painting, still replacement, and library modifications at Cincinnati, Ohio; space renovation, roof reflashing and fish laboratory chiller and compressor at Corvallis, Oregon; and air conditioning modifications and road surface repairs at Duluth, Minnesota. A total of \$375,000 is required to fund these items.

c. Kitchen facilities need to be relocated at the Robert A. Taft Sanitary Engineering Center. At the present time, the kitchen facilities are located across a hall from the serving facility. Local health inspections have cited the laboratory for noncompliance with regulations governing the preparation and serving of food. To correct this problem requires \$60,000. It should be noted that this relocation will also increase the overall efficiency of the cafeteria operation.

Proposed reprogramming

As is noted, no new funds are requested under this appropriation. However, in order to fund the aforementioned requirements, it is proposed that FWPCA be permitted to use \$800,000 from funds appropriated in prior years under the field evaluations activity in this appropriation. Funds for field evaluations are no longer required since this type of activity is now programmed under the research, development and demonstration activity under the "Pollution Control Operations and Research" appropriation.

Basis for Laboratory Construction Program

Section 5 (e) of the Federal Water Pollution Control Act, as amended, provides:

"The Secretary shall establish, equip and maintain field laboratory and research facilities, including, but not limited to, one to be located in the north-eastern area of the United States, one in the Middle Atlantic area, one in the southeastern area, one in the midwestern area, one in the State of Alaska, for the conduct of research, investigations, experiments, field demonstrations and studies

and training relating to the prevention and control of water pollution. Insofar as practicable, each such facility shall be located near institutions of higher learning in which graduate training in such research might be carried out."

In addition to the seven initially authorized in 1966 Congress authorized three more to be located at Columbia, Missouri; Vicksburg-Jackson, Mississippi area; and Stevens Point, Wisconsin.

Water pollution control regional facilities are necessary because:

(1) Water pollution control field activities require readily accessible, substantial and highly technical laboratory support for activities involving development of a comprehensive program for water pollution control, enforcement of pollution abatement, collection of basic data, and technical support to State and local agencies. Technical training for Federal, State, and local water pollution control personnel is also provided at these facilities.

(2) Each region has its own unique water uses and related pollution problems which require intensive research. However, in some cases the findings developed in one region can also be applied to those other regions where similar uses of water exist or are developing.

At the present time four laboratories authorized under this section are completed and generally operational. These include facilities at Athens, Georgia; Ada, Oklahoma; Corvallis, Oregon; and College, Alaska.

In addition to regional water pollution control laboratories, in 1963 the Congress authorized the construction of two national water quality standards laboratories to conduct necessary research for determining water quality standards for salt and fresh water. In light of the Water Quality Act of 1965, which provided for the establishment of standards, the research effort in or through these facilities becomes highly important. The laboratory to conduct research on fresh water is located at Duluth, Minnesota. The salt water research laboratory is planned for Narragansett, Rhode Island.

The construction of the Duluth laboratory was completed in 1967.

Planning for and/or development of plans and specifications for laboratories to be located at Stevens Point, Wisconsin; Columbia, Missouri; and the Middle Atlantic area have been initiated and will continue through 1969 and 1970.

Due to the national fiscal situation and related curtailment in Federal spending, further planning for and/or construction of facilities to be located at Ann Arbor, Michigan; Boston, Massachusetts; Narragansett, Rhode Island; and the Vicksburg-Jackson, Mississippi area have been deferred.

2. Field evaluations: Fiscal year 1969, ...; fiscal year 1970, ...; no change.

As noted heretofore, \$800,000 is proposed to be reprogrammed from funds appropriated for this activity in prior years in order to finance the water pollution control and water quality standards laboratories' requirements.

Acid mine drainage program and field evaluation of advanced waste treatment processes is now programmed under the research, development and demonstration activity under the appropriation "Pollution Control Operations and Research." Therefore, no further activity for these purposes will be proposed or funded under this appropriation account.

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Buildings and Facilities

| | Actual 1968 | Estimate 1969 | Estimate 1970 | Increase (+) Decrease (-) |
|--|----------------|------------------|------------------|------------------------------|
| <u>Program and Financing</u> | | | | |
| Total obligations..... | \$1,218,932 | \$3,379,069 | \$800,000 | -\$2,579,069 |
| Unobligated balance brought forward..... | -12,891,072 | -11,672,140 | -8,293,071 | +3,379,069 |
| Unobligated balance carried forward..... | 11,672,140 | 8,293,071 | 7,493,071 | -800,000 |
| Appropriation..... | ... | ... | ... | ... |
| <u>Obligations by objects:</u> | | | | |
| 21 Travel and transportation of persons..... | 10,502 | 13,200 | 6,000 | -7,200 |
| 22 Transportation of things..... | 944 | ... | ... | ... |
| 23 Rent, communications and utilities..... | 5,000 | 9,000 | ... | -9,000 |
| 24 Printing and reproduction..... | 5,654 | 14,500 | 3,000 | -11,500 |
| 25 Other services..... | 418,433 | 607,705 | 679,000 | +71,295 |
| 26 Supplies and materials..... | 50,265 | ... | ... | ... |
| 31 Equipment..... | 695,809 | 983,504 | ... | -983,504 |
| 32 Lands and structures..... | 32,325 | 1,751,160 | 112,000 | -1,639,160 |
| Total obligations..... | 1,218,932 | 3,379,069 | 800,000 | -2,579,069 |

Construction Grants for Waste Treatment Works

DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
Construction Grants for Waste Treatment Works

| | |
|---|---------------------------|
| Appropriation 1969..... | \$214,000,000 |
| Unobligated balance from prior years..... | +57,692,834 |
| Unobligated balance transferred to "Pollution Control operations and research"..... | <u>-4,334,306</u> |
| Total available for obligation..... | 267,358,528 |
| <u>Decrease:</u> | |
| Waste treatment works construction..... | <u>216,358,528</u> |
| Subtotal..... | <u>51,000,000</u> |
| <u>Increase:</u> | |
| Waste treatment works construction..... | <u>214,000,000</u> |
| Total available for obligation..... | 265,000,000 |
| Less: Unobligated balance from 1969..... | <u>51,000,000</u> |
| Budget estimate, 1970..... | <u><u>214,000,000</u></u> |

Construction Grants for Waste Treatment Works

Analysis by Activities

| Activity | Amount Available 1969 | Fiscal Year 1970 | | | Total Available 1970 Compared to Total Available 1969 | Page Ref. |
|---|-----------------------------|---------------------------------|-------------------------------------|--------------------|--|--------------|
| | | Estimated Total Available | Unobligated Balance from 1969 | Budget Estimate | | |
| 1. Waste treatment works construction..... | \$267,358,527 | \$265,000,000 | \$51,000,000 | \$214,000,000 | -\$2,358,527 | 120 |

Waste treatment works construction: Fiscal year 1969, \$214,000,000; fiscal year 1970, \$214,000,000; no change.

This total is necessary to continue stimulating needed construction or upgrading of waste treatment works for eliminating the discharge of untreated or inadequately treated municipal sewage into the Nation's waterways. The 1970 authorization for this purpose is \$1 billion; because of the national fiscal situation, the amount requested for grants is \$214 million. However, in recognition of the enormous needs in this area legislation has been proposed which will authorize an additional and new method of financing more construction of municipal waste treatment facilities. The amounts proposed each fiscal year would require the approval of Appropriations Committees.

Objective

The program is designed to help bring water pollution from municipalities under control by achieving a rate of construction which will overcome the unmet backlog of needed facilities; to keep pace with needs for new facilities resulting from population growth; and to keep pace with needs to replace facilities which become obsolescent because of age, technical advancement, or population relocation.

Problem

There are in the United States more than 11,000 sewerage communities. These include a population of about 131 million persons. Less than 10 percent of the sewerage population are without waste treatment services. Nineteen percent of the communities and a third of the sewerage population are served by primary or intermediate waste treatment.

A number of influences are acting to push investment requirements upward in spite of the high prevalence of municipal waste treatment. The average size of plant has increased markedly in recent years as has the tendency of municipalities to treat industrial wastes. Costs of interception are rising as municipalities extend the reach of their collection systems. The degree of treatment required of waste-handling facilities is increasing in many cases and with it the unit cost of treatment.

The report to Congress in January 1969, "The Cost of Clean Water," states that the long held expectation that the investment requirements associated with municipal waste treatment would be eased when some "fixed backlog" of needed treatment works was constructed do not seem likely to be borne out by events. As treatment deficiencies give way to new plant construction, investment requirements continue to rise to take care of replacement, upgrading, and treatment of industrial wastes.

If we are to bring municipal pollution under control by 1974--through providing for population growth, upgrading primary treatment works, constructing works for urban population presently unserved, and replacement of obsolete facilities--the average national expenditure must be accelerated.

Program and Appropriation Authorization

Section 8 of the Federal Water Pollution Control Act was amended by the Clean Water Restoration Act of 1966 to authorize appropriations of \$150 million for 1967, \$450 million for 1968 (\$203 million was appropriated), \$700 million for 1969 (\$214 million was appropriated), \$1 billion for 1970, (\$214 million requested), and \$1.25 billion for 1971, for grants to aid in the construction of municipal waste treatment facilities in order to prevent the discharge of untreated or inadequately treated sewage or other waste into any waters. Funds appropriated are apportioned to the States and other jurisdictions according to a formula prescribed by the Federal Water Pollution Control Act, as amended. See pages 123 and 124 for distribution of funds for 1968, 1969 and 1970.

The Federal share, as authorized by the Federal Water Pollution Control Act, as amended, is 30 percent of the estimated reasonable cost of construction of necessary waste treatment works without dollar limitations. The 30 percent limitation may be increased to 40 percent of the State agrees to pay 30 percent of the estimated reasonable cost of all projects receiving Federal funds from the same allocation. The 30 percent limitation may also be increased to 50 percent if enforceable water quality standards have been established for the waters into which the project discharges and the State agrees to pay not less than 25 percent of the estimated reasonable cost of all projects receiving Federal funds from the particular allocation. The amount of a grant or contract may be increased 10 percent if a project is certified as being in conformity with a comprehensive plan developed by an official State, metropolitan or interstate planning agency. Thus, if all conditions are met, the total amount of a grant can be as high as 55 percent of the total cost of construction.

The Federal Water Pollution Control Act, as amended, also provides that in the case of any project on which construction was initiated after June 30, 1966, which was approved by the appropriate State agency and which the Secretary finds meets the requirement of Section 8 but which is constructed without Federal assistance, the allotments for construction grants for any fiscal year ending before June 30, 1971, shall also be available to make payments for reimbursements of State or local funds to the extent that financial assistance could have been provided if the project had been approved pursuant to Section 8 and adequate funds had been available to make a grant. In the case of a project on which construction was initiated after June 30, 1966, and which was constructed with Federal assistance but the amount of assistance was a lesser percent of the cost of construction than was allowable pursuant to Section 8, payment and reimbursement of State or local funds is permitted to the extent that assistance could have been apply, for such retroactive grants as apply if the grant is being made for future construction.

In authorizing the 1966 Amendments, Congress clearly recognized the problems of the larger cities in obtaining significant financial assistance in the construction of needed sewage treatment facilities. The removal of dollar limitations of \$1.2 million, or \$4.8 million in the case of multi-municipal projects, together with the added incentive of higher grant percentages with certain specified State participation, is stimulating many of these larger cities and metropolitan areas to move ahead with construction at an accelerated pace. Greater activity in major cities will result in a greater number of larger projects and, therefore, a greater contribution toward pollution control.

Program of Work

The States and municipalities are proceeding with plans for constructing waste treatment facilities to meet the water quality standards approved by the Department of the Interior pursuant to the Water Quality Act of 1965. It is imperative that the Federal Government demonstrate its continuing resolve to clean up the Nation's streams and lakes by providing the funds requested to assist the communities in doing so.

With the \$214 million in grant authority, construction totalling about \$713 million will have been generated. This estimate is based on the assumption that the overall Federal share will average about 30 percent in 1970.

It is anticipated that new construction starts in 1970 will number 1,150 as compared to 1,000 in 1969. Furthermore, about 1,030 projects will have been completed in 1970 compared to 810 in 1969.

Accomplishments

As of December 31, 1968, including supplemental aid under the Public Works Acceleration Program, the Appalachian Regional Development and the Public Works and Economic Development Acts of 1965, a total of 8,993 projects have been approved for grants totalling \$1.2 billion. Local communities have contributed an additional \$4.3 billion to meet the total project cost of \$5.5 billion.

Approved projects will serve a population of nearly 72 million, and will improve the quality of water in approximately 72,000 miles of streams. As of December 31, 1968, there were 4,679 applications for grants for projects costing \$4.1 billion being processed or reported to be in preparation.

Allocations of Grant-in-Aid Funds for Waste Treatment Works Construction

| State or Territory | 1968 Allocations | 1969 Allocations | 1970 Estimate | Increase Over 1969 |
|----------------------|---------------------|---------------------|------------------|-----------------------|
| Alabama | \$3,933,700 | \$4,130,100 | \$4,135,700 ✓ | +\$5,600 |
| Alaska | 867,300 | 906,900 | 906,100 | -800 |
| Arizona | 2,030,100 | 2,122,800 | 2,125,400 | +2,600 |
| Arkansas | 2,743,500 | 2,829,800 | 2,835,800 | +6,000 |
| California | 13,912,000 | 14,872,400 | 14,882,600 | +10,200 |
| Colorado | 2,293,300 | 2,414,800 | 2,414,900 | +100 |
| Connecticut | 2,786,400 | 2,945,500 | 2,942,200 | -3,300 |
| Delaware | 1,050,600 | 1,083,000 | 1,100,300 | +17,300 |
| District of Columbia | 1,248,600 | 1,299,000 | 1,315,300 | +16,300 |
| Florida | 5,093,900 | 5,395,700 | 5,386,400 | -9,300 |
| Georgia | 4,370,500 | 4,597,100 | 4,589,000 | -8,100 |
| Hawaii | 1,294,100 | 1,348,100 | 1,355,700 | +7,600 |
| Idaho | 1,539,000 | 1,580,400 | 1,589,400 | +9,000 |
| Illinois | 9,175,500 | 9,784,800 | 9,784,300 | -500 |
| Indiana | 4,728,500 | 5,004,800 | 5,008,400 | +3,600 |
| Iowa | 3,196,000 | 3,327,300 | 3,311,000 | -16,300 |
| Kansas | 2,667,200 | 2,815,600 | 2,812,700 | -2,900 |
| Kentucky | 3,654,200 | 3,843,000 | 3,827,100 | -15,900 |
| Louisiana | 3,827,500 | 4,020,500 | 4,009,800 | -10,700 |
| Maine | 1,825,300 | 1,860,600 | 1,853,100 | -7,500 |
| Maryland | 3,354,900 | 3,550,200 | 3,552,100 | +1,900 |
| Massachusetts | 5,068,600 | 5,382,000 | 5,382,800 | +800 |
| Michigan | 7,344,500 | 7,806,900 | 7,809,500 | +2,600 |
| Minnesota | 3,728,000 | 3,931,000 | 3,919,100 | -11,900 |
| Mississippi | 3,246,900 | 3,360,600 | 3,350,200 | -10,400 |
| Missouri | 4,490,500 | 4,755,300 | 4,760,400 | +5,100 |
| Montana | 1,478,900 | 1,540,000 | 1,535,700 | -4,300 |
| Nebraska | 2,067,900 | 2,136,600 | 2,115,500 | -21,100 |
| Nevada | 888,000 | 936,300 | 959,600 | +23,300 |
| New Hampshire | 1,371,900 | 1,419,500 | 1,409,300 | -10,200 |
| New Jersey | 5,790,000 | 6,171,100 | 6,176,800 | +5,700 |
| New Mexico | 1,797,000 | 1,872,900 | 2,058,000 | +185,100 |
| New York | 14,807,900 | 15,828,800 | 15,832,500 | +3,700 |
| North Carolina | 4,937,900 | 5,200,900 | 5,050,800 | -150,100 |
| North Dakota | 1,518,300 | 1,594,000 | 1,583,900 | -10,100 |
| Ohio | 8,966,500 | 9,555,000 | 9,555,500 | +500 |
| Oklahoma | 2,959,300 | 3,090,300 | 3,086,900 | -3,400 |
| Oregon | 2,294,200 | 2,419,600 | 2,429,000 | +9,400 |
| Pennsylvania | 10,348,600 | 11,032,600 | 11,029,600 | -3,000 |
| Rhode Island | 1,521,400 | 1,575,500 | 1,568,500 | -7,000 |
| South Carolina | 3,248,000 | 3,367,900 | 3,342,700 | -25,200 |
| South Dakota | 1,658,800 | 1,662,000 | 1,777,400 | +115,400 |
| Tennessee | 4,127,500 | 4,328,800 | 4,314,600 | -14,200 |
| Texas | 9,013,900 | 9,602,600 | 9,592,800 | -9,800 |
| Utah | 1,680,700 | 1,762,000 | 1,780,700 | +18,700 |

Allocations of Grant-in-Aid Funds for Waste Treatment Works Construction--continued

| State or Territory | 1968 Allocations | 1969 Allocations | 1970 Estimate | Increase Over 1969 |
|--------------------|---------------------|---------------------|------------------|-----------------------|
| Vermont | 1,301,700 | 1,314,600 | 1,282,200 | -32,400 |
| Virginia | 4,278,100 | 4,513,500 | 4,510,200 | -3,300 |
| Washington | 3,176,600 | 3,345,400 | 3,327,200 | -18,200 |
| West Virginia | 2,684,500 | 2,795,600 | 2,796,100 | +500 |
| Wisconsin | 4,166,700 | 4,391,100 | 4,388,100 | -3,000 |
| Wyoming | 1,143,300 | 1,179,600 | 1,172,700 | -6,900 |
| Guam | 1,470,000 | 1,455,900 | 1,445,500 | -10,400 |
| Puerto Rico | 3,391,200 | 3,515,300 | 3,504,900 | -10,400 |
| Virgin Islands | 1,440,600 | 1,424,400 | 1,414,000 | -10,400 |
| Total | 203,000,000 | 214,000,000 | 214,000,000 | ... |

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Construction Grants for Waste Treatment Works

| | Actual 1968 | Estimate 1969 | Estimate 1970 | Increase (+) Decrease (-) |
|--|----------------|------------------|------------------|------------------------------|
| <u>Program and Financing</u> | | | | |
| Total obligations..... | \$193,978,023 | \$216,358,528 | \$227,000,000 | +\$10,641,472 |
| Comparative transfer to "Pollution control operations and research"..... | +11,875,906 | ... | ... | ... |
| Unobligated balance transferred to other accounts: | | | | |
| Appalachian regional development..... | +3,054,998 | ... | ... | ... |
| Pollution control operations and research..... | ... | +4,334,306 | ... | -4,334,306 |
| Unobligated balance lapsing..... | +542,484 | ... | ... | ... |
| Unobligated balance brought forward..... | -64,144,245 | -57,692,834 | -51,000,000 | +6,692,834 |
| Unobligated balance carried forward..... | +57,692,834 | +51,000,000 | +38,000,000 | -13,000,000 |
| Budget authority..... | 203,000,000 | 214,000,000 | 214,000,000 | ... |

Obligations by objects:

| | | | | |
|--|-------------|-------------|-------------|-------------|
| 41 Grants, subsidies, and contributions..... | 193,978,023 | 216,358,528 | 227,000,000 | +10,641,472 |
|--|-------------|-------------|-------------|-------------|