

**FEDERAL WATER POLLUTION
CONTROL ADMINISTRATION**

**DEPARTMENT OF THE INTERIOR
JUSTIFICATIONS FOR APPROPRIATIONS, FISCAL YEAR
ENDING JUNE 30, 1968**



DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration

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DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Highlight Statement

The objective of the Federal water pollution control program is to control and prevent pollution to assure an adequate supply of water suitable in quality for public and industrial water supplies, propagation of fish and aquatic life, wildlife, recreation, agriculture, and other legitimate uses. Accomplishment of this objective requires broad-based and effective participation by all levels of government and others concerned. Therefore, in addition to carrying out its own direct authorities and programs, the Federal Water Pollution Control Administration is deeply involved with the encouragement and support of State and local pollution control efforts, and with development of improved patterns of cooperation at Federal, State and local levels.

The Federal water pollution control program provides for a broad scope of activities necessary to come to grips with the Nation's pollution control problems. These activities include programs such as regulation and enforcement, research and development, technical assistance, training, pollution surveillance, comprehensive basin planning and others. In addition, the program provides for financial assistance to:

- (a) State and interstate pollution control agencies and planning agencies to plan and carry out effective water pollution control programs;
- (b) Local communities to construct needed treatment works;
- (c) Public or private agencies, institutions, and individuals to broaden the base of scientific participation in research; to develop projects demonstrating new or improved water pollution control methods; and to increase the professional and subprofessional manpower resources needed in the water pollution control fields.

Current Status of Program

Today, the national water pollution control effort stands at a major turning point and at the threshold of major new accomplishments. This results from widespread recognition and support by the Congress and Executive Branch, by State and local governments and by the public at large of the need to accelerate progress, if we are to reverse the long trend towards deterioration of our water quality.

At the Federal level, this new emphasis is reflected by the following major actions:

1. Passage of the Water Quality Act of 1965, providing major new Federal authorities for controlling pollution and elevating the Federal program from its previous status as a division within the Public Health Service by creating the Federal Water Pollution Control Administration as an agency within the Department of Health, Education, and Welfare.

2. Issuance in November 1965 of an Executive Order on "Prevention, Control and Abatement of Water Pollution by Federal Activities," providing a greatly strengthened approach to setting the Federal house in order.

3. Issuance of Reorganization Plan No. 2 of 1966, providing for transfer of the FWPCA to the Department of the Interior, thus strengthening mechanisms for coordinating this program with other water resource development activities.

4. Passage of the Clean Water Restoration Act of 1966 which further increased the Federal authorities and programs for controlling pollution and greatly expanding financial support for States, communities, and others.

As a result of these major actions, the Federal Water Pollution Control Administration will be carrying out many new assignments and mandates in 1967 and 1968. Many of its already existing programs, stemming from passage of the basic legislation, the Federal Water Pollution Control Act of 1956, and subsequent amendments, will be continued and strengthened. In addition, the agency will have a major task in developing new programs and policies and in integrating its now diverse authorities to assure the most effective overall approach. Further, major efforts are under way and will continue for the development of the administrative activities to enable the agency to meet its new responsibilities.

New Policies and Programs

The Federal Government now has the legislative tools necessary to reverse the deterioration of the Nation's waters. Many of these tools are now in use and working well. During 1968, these programs will be continued and newly authorized programs will be put into effect.

In response to the legislative history of the 1966 Act, and to the obvious need for such action, the major emphasis of the Federal program will be directed toward putting pollution control on a basin-wide basis to obtain orderly cleanup of entire stream systems. Water quality standards authorized by the Water Quality Act of 1965 will serve as the keystone for scheduling abatement efforts in interstate river basins. During 1967 and 1968, major attention at both State and Federal levels will be directed towards developing these standards and initiating programs to implement them. Federal efforts will emphasize the integration of Federal and State-local planning and abatement activities to meet and maintain these standards. It is anticipated that many States will also establish standards for intrastate waters, which similarly will govern pollution abatement efforts. There will be vigorous application of Federal requirements and guidelines to assure that basin planning grants, State and interstate agency program grants, and municipal waste treatment works construction grants are awarded and utilized in a planned, orderly manner to achieve the desired goal. This will require reorientation of many of the procedures, regulations, and means of operation which existed prior to passage of the 1966 legislation.

At the same time that the reorientation of the program towards an integrated basin-wide approach is proceeding, studies of training needs, industrial waste incentives, and national costs of pollution control, as authorized by the Clean Water Restoration Act of 1966, will be providing more accurate assessments of the adequacy of existing efforts relative to the national need. Recommendations stemming from these studies are expected to contribute significantly to continued development and improvement of the overall national program.

Administrative Developments

Since its creation in December 1966 and its subsequent transfer to the Department of the Interior, the Federal Water Pollution Control Administration has been working towards establishment of an organization which will most effectively and efficiently provide for carrying out the Federal water pollution control program. In addition to reorganization, the Administration was confronted with several significant problems related to its establishment and transfer.

At the time of the transfer of functions from the Public Health Service, the program was staffed with over 300 Public Health Service commissioned officers, many of whom held key positions. In order to avoid the loss of this reservoir of talent, the Water Quality Act of 1965 provided for conversion to civil service status, at the option of the officer, generally with no loss in pay or length of service for retirement purposes. Notwithstanding these inducements, about 50% have converted or will convert. For various reasons, many of the key officers retired or elected to stay with Public Health Service. Therefore, in the past year the Administration has had to seek qualified professionals to replace these officers and fill other key positions created as a result of the establishment of the agency. Another significant problem was to create capability for administrative support. The 1967 budget did not anticipate the transfer of the Administration to the Department of the Interior. In the Department of Health, Education, and Welfare, most of this support was provided by that Department both at headquarters and in regional offices. However, under the Department of the Interior, the Administration has been required to establish and is proceeding generally to develop, full-scale competencies essential for the support of programs.

Therefore, the past months have involved considerable effort toward gearing up with the organizational, staffing, and administrative actions necessary to support the agency's new and expanded mission. These actions are now well advanced and a sound administrative base has been established.

Anticipated Accomplishments in 1968

1. Water quality standards will be established for all significant interstate and coastal waters and a system of surveillance for compliance will be initiated.
2. Research and development activities will be accelerated with particular emphasis on development of waste technology for all major sources

of waste. The program will support 20 projects developing or demonstrating new or improved methods for controlling storm and combined sewer pollution; 20 developmental or demonstration projects for advanced waste treatment or joint waste treatment; 15 field evaluation or demonstration projects in the area of preventing pollution by industry and 50 contracts for developing new and improved methods for solving problems involving services and control of pollution in other areas.

3. State and interstate agency water pollution control programs will be strengthened through the proposed increase from \$5 to \$10 million in grants, and through new and more effective policies for guiding the expenditure of these funds.

4. The establishment of 20 grant-supported State and local basin planning agencies whose efforts will be directed towards establishing a strong institutional basis for basin-wide water quality management.

5. Construction of needed municipal waste treatment projects will continue through financial assistance provided by a \$203 million grant program.

6. Federal efforts to get pollution control on a river basin basis will have produced interim plans delineating immediate pollution control needs for all major river basins. Long-range comprehensive planning efforts will be strengthened as well. The Federal program will be administered in accordance with these findings to assure that all Federal activities are directed toward accomplishing these goals.

7. Special studies of the national cost of water pollution control and industrial waste treatment incentives will have been completed.

8. The training and manpower needs study to be completed at the end of FY 1967 will be used to determine State and local water pollution personnel needs and the capability of Federal programs to meet them. This study and the water craft pollution study, also to be completed at the end of FY 1967, will be used as a basis for developing effective programs to meet the respective needs.

9. A wide range of field investigations, such as enforcement and technical assistance projects, needed for controlling and abating pollution problems in various parts of the country will be advanced or completed. The study of the Nation's estuaries, which is designed to develop recommendations for long-range protective programs, will be well advanced.

10. Water pollution control and water quality standards laboratories will be fully staffed to conduct necessary research and pollution surveillance and provide technical assistance and training. The facilities involved are

the water pollution control regional laboratories at Athens, Georgia; Ada, Oklahoma; Corvallis, Oregon and College, Alaska, now in operation, and the National Water Quality Standards Laboratory at Duluth, Minnesota. The latter is still under construction but will be operational by the end of June 1967.

11. All Federal agencies concerned are anticipated to take steps to implement guidelines established for controlling pollution either from Federal installations or as a result of Federal activities.

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

Budget Estimates Compared to Authorizations

Federal Water Pollution Control Act, as amended

	<u>FY 1967</u>		<u>FY 1968</u>	
<u>Section of Act</u>	<u>Authorization</u>	<u>NOA Estimate</u>	<u>Authorization</u>	<u>NOA Estimate</u>
<u>Section 5--Research, Investigations, Training, and Information</u>				
Carry out all of Section 5 other than subsection (g)	Not Applicable		\$60,000,000	\$37,220,000
(d)--Develop and demonstrate under varied conditions research in three specified areas	\$5,000,000	\$4,010,000	a/	...
(g)--Estuary studies.....	1,000,000	...	1,000,000	970,000
<u>Section 6--Research and Development Grants</u>				
General authorization provided for the purposes set forth in entire section including contracts....	20,000,000	20,000,000	20,000,000	10,000,000
(a)(2)--Advanced waste treatment and joint waste treatment.....	20,000,000	...	20,000,000	10,000,000
(b)--Industrial wastes.....	20,000,000	...	20,000,000	10,000,000
<u>Section 7--Grants for Water Pollution Control Program..</u>	5,000,000	5,000,000	10,000,000	10,000,000
<u>Section 8--Grants for Construction.....</u>	150,000,000	150,000,000	450,000,000	200,000,000
Total.....	221,000,000	179,010,000	581,000,000	278,190,000

a/ Included as part of the \$60 million authorization for all of Section 5 activities.

Appalachian Regional Development Act of 1965

<u>Section of Act</u>	<u>FY 1967</u>		<u>FY 1968</u>	
	<u>Authorization</u>	<u>NOA Estimate</u>	<u>Authorization</u>	<u>NOA Estimate</u>
Section 212-- <u>Construction Grants for Waste Treatment Projects</u>	3,000,000 ^{b/}	3,000,000	6,000,000 ^{c/}	3,000,000

b/ Balance of \$6 million authorization with \$3 million appropriated in fiscal year 1965.

c/ Authorization pending for fiscal years 1968 through 1969.

Water Supply & Water Pollution Control

DEPARTMENT OF THE INTERIOR

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Water Supply and Water Pollution Control

Appropriation, 1966.....	\$44,514,000	
Supplemental appropriation, 1966.....	628,000	
Second supplemental appropriation, 1965 (reappropriation).....	<u>820,000</u>	
Total appropriation, 1966.....		\$45,962,000
Transferred to:		
"Operating expenses, Public Building Service,"		
General Services Administration.....		-48,470
"Salaries and expenses, Office of Surgeon General,"		
Public Health Service, Department of Health,		
Education, and Welfare.....		-10,000
Comparative transfer to:		
"Salaries and expenses, Office of General Counsel,"		
Department of Health, Education, and Welfare.....		-8,000
"Buildings and facilities," Federal Water Pollution		
Control Administration.....		-1,640,382
Comparative transfer from "Construction grants for waste		
treatment works".....		+870,750
Total available, 1966.....		<u>45,125,898</u>
Total appropriation, 1967.....		<u>55,439,000</u>
Comparative transfers from :		
"Construction grants for waste treatment works".....		+39,129,250
"Salaries and expenses, Office of the Secretary,"		
Department of Housing and Urban Development.....		+50,000

Transfer to:

"Operating expenses, Public Buildings Service," General Services Administration.....	-295,260
"Salaries and expenses, Office of the Solicitor".. <i>18. pgs.</i>	-116,000

Transferred from "Salaries and expenses, Office of Field Administration," Department of Health, Education, and Welfare..... <i>9. pgs.</i>	+55,000
Total available, 1967.....	<u>94,261,990</u>

Summary of Increases and Decreases, 1968

	<u>Base for 1968</u>	<u>Increase 1968</u>	
<u>Grants:</u>			
<u>Research and development</u>			
Decrease generally due to new obligational authority for 1967 and balances available from 1966 funds exceeding request for 1968.....	\$48,648,250	-\$9,678,250	
<u>Training</u>			
Support graduate and technical training grants.....	3,543,000	+947,000	
<u>State and interstate agency programs</u>			
Increase support as authorized by Clean Water Restoration Act of 1966	5,000,000	+5,000,000	
<u>Comprehensive basin planning</u>			
Provide support to river basin planning agencies.....	...	<u>+1,000,000</u>	-2,731,250
<u>Direct operations:</u>			
<u>Comprehensive planning, management, and assistance</u>			
Accelerate implementation of Clean Water Restoration Act of 1966 and initiate or expand selected technical studies for comprehensive river basin programs..... <i>736</i>	9,493,740	<i>+33</i> +1,083,260	
Strengthen water quality standards development activity to further implement Water Quality Act of 1965... <i>42</i>	258,000	<i>+20</i> +392,000	

	<u>Pos</u>		<u>Pos</u>		<u>Pos</u>
Initiate comprehensive study of effects of pollution in estuaries directed by Clean Water Restoration Act of 1966.....	--	...	+20	+970,000	
Staff operational laboratories to full complement and strengthen program direction for technical assistance....	241	2,833,000	+68	+364,000	
Provide pollution surveillance support for FWPCA activities and assistance to States and local agencies due to Water Quality Act of 1965 and Clean Water Restoration Act of 1966.....	133	1,404,000	+56	+582,000	
Expand technical and graduate training and initiate management internship program.....	65	762,000	+34	+238,000	
Provide for undertaking economic and manpower evaluation studies required by the Clean Water Restoration Act of 1966.....	--	...	+12	+400,000	
Provide for positions authorized to be filled in 1967 for control of pollution from Federal installations activity.....	78	680,000	--	+85,000	
Nonrecurring equipment costs.....		...		-850,000	
Partial or complete phase-out of three comprehensive river basin projects and one technical assistance - 0 pos. project.....	33 pos.	...	-33	-776,000	+2,488,260

Research and development

Strengthen program direction, complete staffing of laboratories, and provide for accelerated field work.....	541	7,507,000	+211	+2,315,000	
Accelerate contract effort.....		1,600,000		+6,000,000	
Provide for adequate support for grants and contracts management.....	30	574,000	+15	+142,000	
Nonrecurring equipment costs.....		...		-203,000	+8,254,000

Regulation and enforcement

Provide for compliance of water quality standards and administration of the Oil Pollution Control Act.....	358	3,799,000	+46	+353,000	
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Partial or complete phase-out of major investigatory projects.....	<i>Pos</i>	...	<i>Pos</i> -43	-728,000	<i>Pos</i>
Nonrecurring equipment costs.....		...		-15,000	+3 -390,000
<u>Construction grants administration</u>					
Provide for positions authorized to be filled in 1967....	<i>195</i>	1,898,000	-	+8,000	
Nonrecurring equipment costs.....		...		-22,000	-- -14,000
<u>Administration</u>					
Provide for strengthening executive direction for international activities and contract compliance and equal employment opportunity.....	<i>53</i>	722,000	+15	+170,000	
Increase administrative management to permit adequate support of program activities.....	<i>199</i>	1,975,000	+45	+735,000	
Strengthen regional office support to service field activities.....	<i>114</i>	817,000	+36	+383,000	
Provide for public information activities in regional offices.....	<i>30</i>	388,000	+6	+65,000	
Credit civil service retirement fund for Public Health Service commissioned officers converted to civil service status.....		...		+350,000	<i>+102</i>
Nonrecurring equipment costs.....		...		-98,000	+1,605,000
<u>Cost reduction</u>					
Nonrecurring 1967 savings on employment deferral.....				-2,360,000	
Net increase, 1968.....				<i>+541</i> +6,852,010	
Budget estimate, 1968.....				<i>9,389</i> 101,114,000	

DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
Water Supply and Water Pollution Control

Activity	Analysis by Activities				
	Fiscal Year 1966		Fiscal Year 1967		
	Amount Available	Total Appropriation	Pay Cost Supplemental	Transfers	Amount Available
Grants:					
Research and development.....	\$9,080,405	\$9,519,000	...	+\$39,129,000 ^{a/}	\$48,648,000
Training.....	3,209,997	3,543,000	...	...	3,543,000
State and interstate agency programs.....	4,809,527	5,000,000	...	...	5,000,000
Comprehensive basin planning.....	...	...	...	...	...
Direct operations:					
Comprehensive planning, management, and assistance.....	10,158,017	15,596,000	...	-165,000 ^{c/}	15,431,000
Research and development.....	5,839,318	9,760,000	...	-79,000 ^{c/}	9,681,000
Regulation and enforcement.....	3,132,357	3,862,000	...	-63,000 ^{c/}	3,799,000
Construction grants administration.....	1,406,372	1,877,000	...	+21,000 ^{c/}	1,898,000
Administration.....	3,638,243	3,922,000	...	-20,000 ^{c/}	3,902,000
Unobligated balance lapsing.....	3,851,662 ^{b/}	2,360,000	...	...	2,360,000
Total.....	45,125,898	55,439,000	...	38,823,000	94,262,000

a/ Comparative transfer from "Construction grants for waste treatment works."

b/ Includes \$1,655,618 for field evaluation activities (acid mine drainage) reappropriated under "Buildings and facilities."

	Transfer from:		Transfer to:		Net Adjustment
	Department of Health Education, & Welfare	Department of Housing & Urban Development ^{d/}	Office of Solicitor	General Services Administration	
Comprehensive planning.....	...	...	-65,000	-100,000	-165,000
Research and development.....	...	...	...	-79,000	-79,000
Regulation and enforcement.....	...	...	-41,000	-22,000	-63,000
Construction grants administration	...	50,000	...	-29,000	+21,000
Administration.....	55,000	...	-10,000	-65,000	-20,000
	+55,000	+50,000	-116,000	-295,000	-306,000

d/ Comparative transfer from "Salaries and expenses, Office of the Secretary."

Water Supply and Water Pollution Control

Analysis by Activities

	<u>FY 1966 Amount Available</u>	<u>FY 1967 Amount Available</u>	<u>FY 1968 Estimate</u>	<u>Increase (+) Decrease (-) Over 1967</u>	<u>Page Ref.</u>
1. <u>Grants</u>	\$17,099,929	\$57,191,000	\$54,460,000	-\$2,731,000	
(a) Research and development.....	9,080,405	48,648,000	38,970,000	-9,678,000	14
(b) Training.....	3,209,997	3,543,000	4,490,000	+947,000	30
(c) State and interstate agency programs.....	4,809,527	5,000,000	10,000,000	+5,000,000	36
(d) Comprehensive basin planning.....	...	...	1,000,000	+1,000,000	44
2. <u>Direct operations</u>	24,174,307	34,711,000	46,654,000	+11,943,000	
(a) Comprehensive planning, management, and assistance..... ^{1,006}	10,158,017	^{1,275} 15,431,000	^{1,505} 17,919,000	⁺²¹⁰ +2,488,000	45
(b) Research and development..... ⁴⁹⁸	5,839,318	⁵⁹⁶ 9,681,000	⁸²² 17,935,000	⁺²²⁶ +8,254,000	98
(c) Regulation and enforcement..... ³³⁴	3,132,357	³⁵⁸ 3,799,000	³⁶¹ 3,409,000	⁺³ -390,000	114
(d) Construction grants administration..... ¹⁵⁹	1,406,372	¹⁹⁵ 1,898,000	¹⁹⁵ 1,884,000	- -14,000	121
(e) Administration..... ³³⁸	3,638,243	³⁷⁶ 3,902,000	⁴⁹⁸ 5,507,000	⁺¹⁰² +1,605,000	124
Unobligated balance lapsing.....	3,851,662	2,360,000	...	-2,360,000	
Total..... ^{2,335}	45,125,898	^{2,840} 94,262,000	^{3,381} 101,114,000	⁺⁵⁴¹ +6,852,000	

Research and Development Grants

(a) Research and development grants

Analysis by Activities

	FY 1966 Amount <u>Available</u>	FY 1967 Amount <u>Available</u>	FY 1968 <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1967</u>
Storm and combined sewer.....	\$870,750 ^{a/}	\$29,112,450 ^{a/}	\$10,000,000	-\$19,112,450
Advanced waste treatment and joint treatment.....	...	7,397,100 ^{a/}	10,000,000	+2,602,900
Industrial wastes.....	...	2,619,700 ^{a/}	10,000,000	+7,380,300
General.....	8,209,655	9,519,000	8,970,000	-549,000
Unobligated balance lapsing.....	345	...	...	...
Total.....	9,080,750	48,648,250	38,970,000	-9,678,250

a/ Comparative transfers from "Construction grants for waste treatment works."

Storm and combined sewers: FY 1967, \$29,112,450. FY 1968, \$10,000,000; Decrease, 19,112,450. The decrease consists of:

\$9,112,450 of obligations incurred from funds appropriated for 1966 and \$10,000,000 less in new obligational authority being proposed for 1968 than was appropriated for 1967.

Purpose

Section 6. (a)(1) of the Federal Water Pollution Control Act Amendments of 1966 (Clean Water Restoration Act of 1966) authorizes \$20,000,000 annually for fiscal years 1966 through 1969 for grants to public bodies such as States, municipalities, intermunicipal or interstate agencies for the purpose of assisting in the development of projects which will demonstrate new or improved methods of controlling the discharge into any waters of untreated or inadequately treated sewage or other wastes from sewers which carry storm water or both storm water and sewage or other wastes. The Act authorizes grants of up to 75 percent of the estimated reasonable cost of projects with no dollar limitation on individual grants. Prior to passage of the

Clean Waters Restoration Act, Federal participation was up to 50%. Grants will be used for investigation and evaluation of methods and ideas as determined to be necessary for successful accomplishment of program objectives. Methods believed to have potential as solutions or partial solutions to the problem, but as yet untried, can be adequately field tested. In developing statements of work required for individual grant projects, emphasis will be placed on the construction and operation of facilities which apply new or improved methods for reducing pollution from storm or combined sewers.

It should be noted that the Clean Water Restoration Act provides that funds appropriated for this purpose can also be used for advanced waste treatment and joint treatment and industrial waste activities, including the use of contract authority. However, it is the intent that before such action is taken, these funds be used for storm and combined sewer activity to the extent possible.

Program of Work

The awarding of grants and/or contracts will be continued in accordance with the basic objectives. By the end of 1968, there should also be a preliminary indication of the type of nationwide remedial program which would be necessary to alleviate the basic problem.

In addition to the primary objectives, there will be additional effort in studies and investigations in selected problem areas where adequate knowledge does not exist. Examples of areas in need of study include: evaluation of the effectiveness of sewer separation in

actually reducing pollution; improving sewer design; improved design of inlet structures and catch basins; development of systems analysis and control methods; studies of the economic, social and aesthetic impact of sewer separation and use of alternative corrective measures; and improved techniques of urban hydrologic analyses.

With the new 75% funding provision and the elimination of a dollar ceiling on individual projects, it is anticipated that the added impetus necessary to stimulate participation in the grant program has been provided.

Accomplishments

In 1966 considerable effort was devoted to developing program policy guidelines and objectives. One grant was awarded for the construction of a dispatching system for control of combined sewer losses in Minneapolis-St. Paul, Minnesota.

In 1967 increased effort is being made to further stimulate the demonstration grant feature of the program. Emphasis is being placed on the delineation of types of projects that are now known to require evaluation to determine effectiveness and applicability on a nationwide basis. Included in this analysis is the need for investigating the effectiveness of duplication or similar projects of various types under different physiographical and climatological conditions in various sections of the country.

As of December 31, 1966, eight additional grants and ten contracts were awarded totalling over \$9,081,000. Examples of grants awarded are as follows:

<u>Recipient</u>	<u>Purpose</u>
Boston Metropolitan District	Demonstrate use of short-term detention and disinfection
Detroit Board of Water Commissioners	Demonstrate improved use of sewerage system storage capacity, remote control of regulation and optimized control of combined sewer overflows.
Minneapolis-St. Paul, Minnesota	Construction of a dispatching system for control of combined sewer losses.

Examples of contracts awarded:

<u>Recipient</u>	<u>Purpose</u>
American Public Works Association, Chicago, Illinois	Demonstrate pollution reduction by means of better city cleaning methods.
Melpar Inc., Falls Church, Virginia	Determine feasibility of utilizing "offshore" storage and treatment.
American Society of Civil Engineers, Cambridge, Massachusetts	Demonstrate feasibility and economy of separating sanitary wastes and storm water by utilizing pressure conduits within existing combined sewers.
Rand Development Corp., Cleveland, Ohio	Demonstrate applicability of combustible filters for treat- ment of overflows.

Advanced waste treatment and joint treatment: FY 1967, \$7,397,100; FY 1968, \$10,000,000. Increase, \$2,602,900. The increase is to:

Accelerate the level of grant activity to public bodies for developing projects or demonstrating new or improved methods in this area to a total program effort of \$10,000,000.

Purpose

Section 6.(a)(1) provides for a new grant program which authorizes \$20,000,000 annually from 1967 through 1969 for grants to any State, municipality, or intermunicipal or interstate agency for the purpose of assisting in the development of any projects which will demonstrate advanced waste treatment and water purification methods or new or improved methods of joint treatment systems for municipal and industrial wastes. Grants, under this subsection, are not to exceed 75 percent of the estimated reasonable cost.

The use of the grant mechanism will greatly accelerate the development and demonstration of practical means for treating waste waters to remove the maximum possible amounts of pollutants leading to the application of new and improved pollution control techniques including the benefits resulting from repeated reuse of the Nation's waters at lowest cost. This will assist in minimizing the time lags between research findings and the public benefits resulting from application of these findings.

Research and development grants are also to be utilized to investigate and develop processes for the joint treatment of municipal and industrial wastes, including the economic aspects of such arrangements, and the possibilities of using public facilities for treating wastes from industries.

Program of Work

The need for new and improved methods of waste treatment and the need for expanded Federal effort was recognized by the Federal Government some six years ago with the initiation of research on advanced waste-treatment. In the last two years or so, new processes under development have emerged from the laboratory and are now well into the pilot plant stage. Several of these are now ready for full-scale construction and demonstration. This program will allow these studies to be accomplished as rapidly as possible and under a variety of conditions in order to bring these processes to readiness for widespread application to control pollution.

Many of the new separation processes under development will apply to industrial wastes either separately or in combination with municipal sewage. These, as well as modifications of conventional treatment technology to handle joint wastes, will be developed.

It is anticipated that in 1968 design of facilities for grants awarded in 1967 and early 1968 will be completed. Construction of first field evaluation and demonstration facilities will be under way and, in some cases, operation of experimental plants will be initiated.

The 1968 estimate will support about 20 to 30 grants.

Accomplishments

In 1967, although no funds were appropriated for this purpose, the program utilized the new provisions of the Clean Water Restoration Act of 1966 which permit the utilization of storm and combined sewer funds for this purpose in the event activity in the storm and combined sewer area was not reaching expectations. The total shown for 1967, \$7,397,100, was utilized accordingly for 15 grants and contracts.

Examples of grants made are as follows:

<u>Recipient</u>	<u>Purpose</u>
Santee County Water District Santee, California	The immediate objectives of the project are to demonstrate on full-scale that all pollution in the effluent of a recently constructed activated sludge plant can be removed through biological, mechanical, and chemical means so that the effluents can then be used even for body contact sports and other recreational activities. It will, of course, also demonstrate the elimination of bacteria and viruses.
Government of the District of Columbia, Washington, D. C.	To determine and optimize the improvement in solids, capture in full-scale primary settlers produced by addition of polyelectrolytes and to determine the effect of waste water flocculation on operational efficiency and evaluate polyelectrolytes. To demonstrate increased efficiency of pollutant removal at existing treatment facilities.

<u>Recipient</u>	<u>Purpose</u>
City of Detroit, Department of Water Supply	<p>To screen, at pilot scale, alternative methods for achieving at least 80% phosphate removal, and to develop comparative design, operating, and cost data for systems.</p> <p>To develop and specify the optimum phosphate removal process for use at Detroit and to establish the necessary design and operating correlations for this system.</p>
Green Bay Metropolitan Sewage District, Green Bay, Wisconsin	<p>To determine the effectiveness of design and operating parameters of alternative biological treatment processes and modifications for treating combined municipal and industrial (primarily paper mill) waste waters. Pilot waste water treatment plants for each of the considered processes will be operated in parallel and the effluent quality, operating parameters, design variables, and cost relationships for each process will be established. After the selection of the most promising process, a pilot plant will be designed and operated for a full year in order to demonstrate its performance and to generate cost data.</p>

Industrial waste: FY 1967, \$2,619,700; FY 1968, \$10,000,000. Increase, \$7,380,300. The increase is to:

Accelerate the level of grants to persons for research and demonstration projects for prevention of water pollution by industry to a total program effort of \$10,000,000.

Purpose

Section 6.(b) of the Act authorized \$20,000,000 annually from 1967 through 1969 for grants to persons for research and demonstration projects for prevention of pollution of waters by industry including, but not limited to, treatment of industrial waste. A grant awarded under this subsection of the Act shall not exceed \$1,000,000 and shall not exceed 70 percent of the cost of the project.

To eliminate a significant gap in water pollution control knowledge, a research and development grant program directed to treatment and control of industrial wastes was authorized by this Act. Technical solution to one of the most significant sources of pollution, industrial wastes, can now be vigorously pursued through this program.

Program of Work

Grants will be utilized to determine in-plant process and operation modifications as well as closed system possibilities for industry, approaching a "no-waste" concept. Where this is not possible, new developments in waste treatment will be researched and demonstrated through the cooperation of specific industries.

It is anticipated that in 1968 design of facilities for grants awarded in 1967 and early 1968 will be completed.

Construction of first field evaluation and demonstration facilities will be under way and in some cases operation of first experimental plants will be initiated.

It is anticipated that the \$10,000,000 will support 15-20 grants each year.

Accomplishments

In 1967, although no funds were appropriated for this purpose, the program utilized the new provision of the Clean Water Restoration Act of 1966 which permits the utilization of storm and combined sewer funds for this purpose in the event activity under that program was not developing as expected. The total shown for 1967, \$2,619,700, was utilized for 10 grants.

Examples of grants made are as follows:

<u>Recipient</u>	<u>Purpose</u>
The Mead Corporation Chillicothe, Ohio	<p>To determine effect of influent quality on biological treatment of pulp and paper wastes.</p> <p>To evaluate potential of plastic trickling filters alone and in combination with brush-aerated oxidation ditch, conventional aerated lagoon and deep aerated lagoon.</p> <p>To achieve higher than conventional biological oxygen demand removals on kraft mill wastes.</p> <p>To operate continuous pilot treatment plant containing plastic trickling filter, brush-aerated oxidation ditch, conventional aerated lagoon, deep aerated lagoons, and two clarifiers in combinations and evaluate possible efficiencies.</p>
Vahlsing Incorporated Easton, Maine	<p>Demonstrate the feasibility of treatment of potato processing wastes using the activated sludge system; feasibility of combining potato processing waste with sugar beet refining waste; and feasibility of three in-plant closed waste water systems in the sugar beet plant.</p> <p>The project will provide extremely valuable data to both the potato processing and beet sugar industry and determine if a thirty million dollar industrial complex of potato and sugar beet processing and residential community can exist on a small stream as is presently proposed and have clean water.</p>

Recipient

Caldwell Lace Leather Company
Auburn, Kentucky

FMC Corporation
Santa Clara, California

Purpose

Demonstrate the feasibility of treating complete tannery waste in the only plant in America that tans all three types of leather tannages today--chrome, vegetable, and alum, and to secure basic data for design of full scale treatment plants for any tannery.

Demonstrate reliable performance of a revised Kehr Process employing liquid-solids separation by a system of high rate flotation--densification of activated sludge solids.

Demonstrate effectiveness of this process for treating fruit and vegetable cannery wastes combined with domestic sewage.

Demonstrate performance of the revised process with densified return sludge solids on a dry weight basis, thus effecting plant economy by use of smaller tankage volume.

Determine processing requirements for application to a full-scale treatment plant.

General: FY 1967, \$9,519,000; FY 1968, \$8,970,000; Decrease, \$549,000.

A. Demonstration grants

	FY 1967 Amount Available		FY 1968 Estimate		Increase (+) Decrease (-) Over 1967	
	No.	Amount	No.	Amount	No.	Amount
Continuations	30	\$1,066,000	52	\$2,500,000	+22	+\$1,434,000
New	40	1,983,000	...	...	-40	-1,983,000
Total	70	3,049,000	52	2,500,000	-18	-549,000

The decrease consists of:

An increase of \$1,434,000 to continue supporting grants made in prior years.

A decrease of \$1,983,000 since the estimate does not provide for any new awards in 1968.

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 or private agencies and institutions and to individuals for demonstration projects not eligible under the programs authorized by the new Section 6 of the Act.

The program mission is to stimulate the application of research findings and expedite the incorporation of new knowledge into water pollution control practice.

This program supports a wide range of projects, from the control of lake eutrophication to the feasibility of comprehensive regional water pollution control planning. Demonstration projects accelerate the total water pollution control effort by utilizing the resources and competencies of organizations and individuals not ordinarily available. Grantees under this program normally provide matching funds.

The principal results from demonstration grant support are:

(a) Technical information--Demonstration projects develop new information which is promptly disseminated. This information is applied in the water pollution control field to improve current treatment and administrative practices.

(b) Technical competence--Demonstration grants provide opportunities for the staff of grantee agencies to participate in the development of new and advanced methods of water quality management. These grants stimulate interaction between engineers, scientists, administrators, and the public to broaden and accelerate the water pollution control effort.

Prior to the Clean Water Restoration Act of 1966, grants under this section covered areas now authorized under Section 6. Grants in this area in the future will be confined to projects not eligible under the Section 6.

Program of Work

In 1968, active projects will be reviewed or visited by program staff to obtain information on demonstration accomplishments not available through progress or terminal reports.

Accomplishments

In 1966 demonstration grants were awarded to 41 institutions and agencies.

Examples of new demonstration grant awards in 1966 include:

- | | | |
|-----|---|--|
| (a) | Orange County Water District
Santa Ana, California | "Reclamation of Waste Waters
for Injection Underground" |
|-----|---|--|

The purpose of this project is to reclaim waste waters for injection underground in order to recharge fresh water aquifers and prevent salt water intrusion. Efficient and economical methods of accomplishing this purpose are needed in many areas where natural ground water recharge is limited and existing ground water sources are threatened by salt water intrusion.

- | | | |
|-----|--|--|
| (b) | Department of Civil Engineering
University of Notre Dame
South Bend, Indiana | "Effects of Domestic Pollution
Abatement on an Eutrophic
Lake" |
|-----|--|--|

The purpose of this project is to demonstrate changes in an eutrophic lake when the source of pollution enrichment is removed. The information developed will be widely applicable to the reclamation of eutrophic lakes for beneficial uses.

- | | | |
|-----|---|--|
| (c) | Department of Civil Engineering
University of Kansas
Lawrence, Kansas | "Cattle Feed Lot Waste Water
Treatment" |
|-----|---|--|

The purpose of this project is to demonstrate a process for treating cattle feed lot waste water for reuse and pollution prevention. The

development of such a process is necessary, since large cattle feed lot operations are new and no effective process exists for treating these high-strength wastes.

- (d) Delaware River Basin Commission "Interstate Regional Planning
Trenton, New Jersey for Water Supply and Waste
Disposal"

The purpose of this project is to demonstrate the feasibility of comprehensive water pollution control planning for a rapidly growing recreational area. Effective planning involving a variety of agencies is needed to develop and implement comprehensive river basin plans.

B. Research grants

	FY 1967 Amount Available		FY 1968 Estimate		Increase (+) Decrease (-) Over 1967	
	No.	Amount	No.	Amount	No.	Amount
Continuations	157	\$4,139,000	143	\$3,700,000	-14	-\$439,000
New	90	2,331,000	104	2,770,000	+14	+439,000
Total	247	6,470,000	247	6,470,000	...	...

Although the total 1968 estimate is the same as that available in 1967, it will provide for supporting 104 new grants or 14 more than awarded for 1967. This is due to the fact that the number of continuation grants, i.e., commitments from prior years, for 1968 is less than supported in 1967.

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 or private agencies and institutions and to individuals for research projects.

The mission of the research grant programs is to broaden the base of scientific participation in water pollution control research, expand such activities throughout the nation, and bring new and imaginative ideas to bear on problems in this field.

The principal results of research grant support are to complement and strengthen in-house and contract activity by bringing the specialized capabilities and facilities of grantees to bear on the more basic and fundamental scientific needs in pollution control. The most significant technological developments often result from a better understanding of the mechanisms of physical, chemical, and biological systems. The

empirical approach to improvement of pollution control systems cannot be relied upon to develop the new and improved methodologies and systems needed for many of our current problems and most of tomorrow's problems.

As a "spinoff" from this type of program, research grant support develops the competence of professional personnel in the field of water pollution control. This practical training expands the resource of manpower required in the water pollution control field.

Program of Work

The estimate for 1968 of \$6,470,000 will support a total of 247 research projects, of which 143 are committed continuations (projects awarded in prior years with an additional year of committed grant support), and 104 for new research investigations.

In 1968 the research program will place greater emphasis on program development and review. Potential grantees will be visited to stimulate project development in the areas of primary importance to the Administration, and to attract the efforts of new scientific and engineering talents. Active projects will be reviewed by program staff to obtain information on research accomplishments not available through progress or terminal reports.

Accomplishments

In 1966, 269 research projects supported by these grants utilized the research competencies and facilities of investigators to study a wide variety of research problems in engineering and scientific aspects of water pollution control.

Grants were awarded to 116 institutions and agencies in 40 States, the District of Columbia, and 6 foreign countries. A total of 1,173 professional staff and graduate students were engaged in the research projects supported by these grants. The personnel involved includes 491 in fields of engineering, and 218 in physical science disciplines, 433 in biological sciences, and 31 in social sciences.

Also, in 1966, an "Index of Research Grant Publications and Reports" was published. The "Index" includes a total of 545 references to recent research findings. This document has been widely distributed to the scientific community as a source for retrieval of references to technical literature which has resulted from research grant awards.

Examples of new grant awards in 1966 include:

- | | |
|------------------------------------|------------------------------|
| (1) University of Arizona | "Rainstorm Debris Floods and |
| Department of Watershed Management | their Relation to Water |
| | Pollution" |

The purpose of this project is to develop measures to prevent pollution of water supplies from forest range watersheds in which excessive amounts of vegetation have been removed by fire and destructive land uses. This research is needed to control pollution of water resources from land runoff.

- | | |
|-----------------------|---------------------------|
| (2) Lehigh University | "Thermal and Industrial |
| Department of Biology | Pollution of the Delaware |
| | River" |

The purpose of this project is to provide essential information on the effect of waste heat from a power plant and effluent from paper mills on aquatic life in a river. This research is needed to evaluate the effect of these discharges and to predict such effects on water quality management in future planning.

- | | |
|---------------------------------|---------------------------|
| (3) University of Washington | "Reduction of Waste Water |
| Department of Civil Engineering | Odors by Soil Filtration" |

The purpose of this project is to determine the basic biological and physical factors responsible for odor reduction. This research is directed to the practical application of information to improved design and operation of soil filters.

In 1967, the same level of professional and graduate student participation supported by grants is anticipated.

An updating of the research "Index" is currently under way and is expected to add more than 400 additional references to the total.

As an additional accomplishment, many water pollution control research grant projects have resulted in or lead to successful demonstration grant projects. Examples of these are described below:

- (1) Research Grant--A. P. Black, University of Florida, titled "A comprehensive study of water coagulation," resulted in: Demonstration Grant--D. Tossey, City of Dayton, Ohio, titled "Tertiary treatment by flocculation and rapid sand filtration" (involving aspects of coagulation).

(2) Research Grant--W. J. Oswald, University of California, titled "Nutritional and disease transmitting properties of sewage grown algae," resulted in: Demonstration Grant--Fischer, Beet Sugar Foundation, Fort Collins, Colorado, titled "Treatment of beet sugar wastes in facultative and algae ponds."

(3) Research Grant--J. Shapiro, Johns Hopkins University, Maryland, titled "Reducing secondary effluent phosphorus concentration at sewage treatment plants," resulted in: Demonstration Grant--G. Remus, City of Detroit, Michigan, titled "Development of an optimum phosphate removal process."

Training Grants

(b) Training grants

	<u>Analysis by Activities</u>			
	<u>FY 1966 Amount Available</u>	<u>FY 1967 Amount Available</u>	<u>FY 1968 Estimate</u>	<u>Increase (+) Decrease (-) over 1967</u>
Training grants	\$2,499,998	\$2,910,000	\$3,900,000	+\$990,000
Fellowships	709,999	633,000	590,000	-43,000
Unobligated balance lapsing	<u>3</u>	<u>...</u>	<u>...</u>	<u>...</u>
Total	3,210,000	3,543,000	4,490,000	+947,000

Training grants: FY 1967, \$2,910,000; FY 1968, \$3,900,000; Increase, \$990,000.

	FY 1967 Amount Available		FY 1968 Estimate		Increase (+) Decrease (-) Over 1967	
	No.	Amount	No.	Amount	No.	Amount
Continuations	65	\$2,860,000	66	\$3,300,000	+1	+\$440,000
New	1	50,000	14	600,000	+13	+550,000
Total	66	\$2,910,000	80	\$3,900,000	+14	+\$990,000

The increase consists of:

- (1) \$550,000 to support an additional 13 new graduate and technical training grants.
- (2) \$440,000 to fund continuation of graduate training grants made in prior years

Need for Increase

To meet the increasing demand for all the skills and specialties needed in the water pollution control field, it is necessary to stimulate training, not only in the professional field but also at the technical level, through the development of new and improved institutional training programs.

To assist in achieving these needs an increase of \$550,000 or a total of \$600,000 is proposed for new grants. These funds will support 7 new grants to higher educational institutions to increase the resources of professional manpower and 7 grants to technical schools, junior colleges and similar institutions to increase the resources of subprofessional manpower.

The \$440,000 is primarily required to support the increasing level of cost which normally occurs after the initial award. After the first year of the award, and most projects are generally programmed for five years, the institution training budgets generally provide for additional student participation, curriculum expansion, and essential training aids. Therefore, to provide for the planned development of on-going training projects, the additional funds requested are necessary.

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.

Graduate training

The graduate training program is designed to increase the resource of professional manpower required for scientific, technical and economic management positions in water pollution control. There is a critical need for individuals having such training in government, industry, and educational institutions.

Graduate training grants are awarded to educational institutions to establish or expand advanced training in water pollution control. Under this program institutions are encouraged to develop specialized and multidisciplinary training of scientists, engineers, and administrators in water quality management. These grants provide funds to support expansion and improvement of faculties, equipment, and trainee stipends for graduate students participating in the training program.

Technical training

The technical training grant program is to increase the resource of subprofessional manpower required for water pollution control activities. These grants will develop the capabilities of appropriate institutions to provide full time specialized technical training. Awards normally will be made to schools in localities where there is the most evident present and future need for trained technicians and plant operators.

The Nation's resource of trained manpower must be increased to support rapidly expanding developments in waste water treatment and water quality. These manpower requirements cover a broad range of professional and subprofessional levels. In addition to highly trained engineers and scientists, there is an immediate need for supporting staffs of skilled engineering aides, scientific technicians, and treatment plant operators.

Technical training grants will complement graduate training grants by extending training support to the level of subprofessional specialists. Technical training grants will be awarded to technical schools, junior colleges, and similar institutions to establish or expand full time training of new technical personnel in water pollution control. These grants will provide funds for teaching staff, equipment, and stipends to trainees.

Program of Work

Graduate training

In 1968 emphasis will be placed on the establishment of new graduate training projects at schools in geographical areas which currently do not

have training grant support. The objective will be to strengthen the academic capabilities of educational institutions for specialized training in the field of water pollution control, and to increase the number of institutions participating.

Technical training grants

Also, in 1968 a new program of technical training grants will be developed. The program will be initiated with an estimated 7 new technical training projects. These projects will be designed to substantially increase the Nation's resources of trained manpower needed to support rapidly expanding developments in waste water treatment and water quality management.

Accomplishments

Graduate training

In 1966, training grants were awarded to 51 institutions in 36 states. These graduate training programs provided for the support of 364 graduate students.

During 1966 a total of 92 trainees received advanced degrees at the MS and Ph.D. levels. Of these, 32 were immediately employed in government, 26 in industry, and 24 in educational institutions. The remaining 10 continued their education toward a higher degree.

Examples of new training grant awards in 1966 include:

Institution

Project Title

Michigan State University
Dept. of Fisheries and Wildlife

"Graduate Training of Pollution
Biologists"

University of Missouri
Department of Civil Engineering

"Water and Waste Water
Engineering"

Oregon State University
Dept. of Oceanography

"Training of Estuarine Specialists
in Water Quality"

North Texas State University
Dept. of Biology

"Training of Water Quality
Microbiologists"

University of Wisconsin
Dept. of Civil Engineering

"Water and Waste Water
Control Engineering"

University of Pittsburgh
Laboratory of Field Biology

"Graduate Training in
Aquatic Ecology"

Fellowships: FY 1967, \$633,000; FY 1968, \$590,000; Decrease, \$43,000.

	FY 1967 Amount Available		FY 1968 Estimate		Increase (+) Decrease (-) Over 1967	
	<u>No.</u>	<u>Amount</u>	<u>No.</u>	<u>Amount</u>	<u>No.</u>	<u>Amount</u>
Continuations	63	\$389,000	63	\$440,000	...	+\$51,000
New	<u>39</u>	<u>244,000</u>	<u>22</u>	<u>150,000</u>	<u>-17</u>	<u>-94,000</u>
Total	102	\$633,000	85	\$590,000	-17	-43,000

The decrease consists of:

- (1) An increase of \$51,000 to support additional stipend costs anticipated in 1968 for fellowships awarded in prior years.
- (2) A decrease of \$94,000 due to a reduction in the number of new fellowships awarded proposed for 1968 compared with 1967.

Need for Increase

The \$51,000 is to support a proposed increase in the stipend costs for fellowships awarded in prior years. In the past, the average cost per fellowship has been about \$6,200. However, due to increases in expenses which must be borne by the recipient, agencies have increased awards accordingly. Therefore, the estimate proposes an increase to permit awarding an average of about \$7,000 per recipient, thereby making them consistent with those awarded by other agencies.

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 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 appropriations committees of Congress on his operations under this paragraph.

The mission of this program is to increase the number of scientists and engineers qualified to conduct independent research 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.

Program of Work

In 1968, the research fellowship program will place greater emphasis 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 1966 fellowships were awarded to 113 individuals for research training at 41 institutions in 28 states and in one foreign country.

During 1966, graduate degrees were received by 50 individuals supported by this program. These individuals were immediately employed in educational institutions (38), in industry (7), and in government agencies (5).

Examples of new research fellowship studies are:

<u>Institution</u>	<u>Project Title</u>
Michigan State University Department of Civil Engineering	"Economics of Water Resources and Waste Treatment"
University of Georgia Department of Zoology	"Study of a Pond System Utilizing a Pesticide Tracer"
Northwestern University Department of Economics	"Water Pollution Abatement in the Pulp and Paper Industry"
Iowa State University Department of Botany	"Waste Reclamation in a Sewage Stabilization Pond"

State and Interstate Agency Program Grants

(c) State and interstate agency programs

	<u>Analysis by activities</u>			
	<u>FY 1966 Amount Available</u>	<u>FY 1967 Amount Available</u>	<u>FY 1968 Estimate</u>	<u>Increase (+) Decrease (-) Over 1967</u>
State.....	\$4,552,241	\$4,700,000	\$9,000,000	+\$4,300,000
Interstate agency.....	257,286	300,000	1,000,000	+700,000
Unobligated balance lapsing.....	<u>190,473</u>	<u>...</u>	<u>...</u>	<u>...</u>
Total.....	5,000,000	5,000,000	10,000,000	+5,000,000

State and interstate agency programs: FY 1967, \$5,000,000; FY 1968, \$10,000,000; Increase, \$5,000,000. The increase consists of:

\$5,000,000 for additional grants for supporting active water pollution control programs of which \$4,300,000 is for States and \$700,000 for interstate agencies.

Need for Increase

Rapid population growth, urbanization, and industrialization have rapidly increased the need for efforts by State and interstate agencies to provide effective water pollution control programs. Increases in manpower and money must be made to provide needed technical and administrative support.

New provisions of the Water Quality Act of 1965 and the Clean Water Restoration Act of 1966 present new and greater challenges.

1. Each State has indicated that they will establish water quality standards and an effective implementation plan by June 30, 1967. In addition, many States will establish water quality standards for intrastate waters. Carrying out the implementation plan will require substantial increases in money and manpower.

2. In order to successfully participate in the reorientation of the national antipollution effort to clean up and keep clean entire river basins, the agencies will have to improve program planning, monitoring, and other programs.

3. In order to implement an anticipated intensified grant program to accelerate treatment plant construction, each State will have to increase its workload in design, review, plant inspection, and--most important--development of adequate training programs to meet the growing shortage of trained plant operators.

The increase of \$5,000,000 is authorized by the Clean Water Restoration Act of 1966.

Objective

Section 7 of the Federal Water Pollution Control Act provides grants for active participation by State and interstate agencies in water pollution control programs. These grants to State and interstate agencies enable them to initiate or expand their activities in conducting field studies of actual and potential water pollution problems; establish water quality standards and implementing plans; to establish monitoring systems to provide current information on the quality of existing waters; to train technicians and administrators as specialists in water resources planning and water pollution control; to work with communities and industries to effect abatement of pollution; and to assist municipalities in developing plans for the installation of waste treatment facilities.

Continued and increased financial assistance is important to the States and interstate agencies in maintaining and improving their expanded programs. The State and interstate agencies are expected to spend over \$18 million of their own funds in 1968 as compared to an estimated \$12 million in 1966.

In 1967 the Act 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 year 1968 through 1971. Therefore, the request for 1968 is for \$10,000,000, the full amount authorized by the Act. It provides \$9,000,000 for States and \$1,000,000 for interstate agencies. An accelerated program by the interstate agencies is anticipated during this fiscal year and the increase of \$700,000 will enable them to participate more actively in the field of water pollution control. The tables showing allocations by States and interstate agencies follow:

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

State or Territory	1966 Allocations	1967 Allocations	1968 Allocations	Increase over 1967
Alabama	\$96,100	\$95,900	\$185,300	\$89,400
Alaska	15,500	15,400	19,600	4,200
Arizona	39,800	39,900	71,000	31,100
Arkansas	61,000	61,400	112,600	51,200
California	289,900	294,200	615,300	321,100
Colorado	45,300	45,100	80,700	35,600
Connecticut	82,200	83,000	159,300	76,300
Delaware	45,300	45,400	81,400	36,000
District of Columbia	47,400	47,200	84,400	37,200
Florida	125,900	125,300	252,900	127,600
Georgia	109,700	109,500	212,900	103,400
Hawaii	38,100	38,100	64,700	26,600
Idaho	26,400	26,100	41,000	14,900
Illinois	201,500	203,700	405,800	202,100
Indiana	112,000	112,500	216,800	104,300
Iowa	67,900	67,000	119,700	52,700
Kansas	53,600	53,600	93,100	39,500
Kentucky	86,500	86,600	163,300	76,700
Louisiana	93,700	93,800	177,400	83,600
Maine	36,400	36,200	62,200	26,000
Maryland	87,000	87,900	172,100	84,200
Massachusetts	130,700	130,800	254,300	123,500
Michigan	177,100	174,000	337,200	163,200
Minnesota	80,400	80,800	149,400	68,600
Mississippi	78,300	77,400	143,700	66,300

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

<u>State or Territory</u>	<u>1966 Allocations</u>	<u>1967 Allocations</u>	<u>1968 Allocations</u>	<u>Increase over 1967</u>
Missouri	93,600	94,400	186,000	91,600
Montana	24,700	24,400	38,200	13,800
Nebraska	39,400	39,500	66,600	27,100
Nevada	17,000	17,400	23,700	6,300
New Hampshire	34,600	35,000	60,500	25,500
New Jersey	147,700	149,100	292,700	143,600
New Mexico	31,400	31,300	51,000	19,700
New York	311,300	311,300	630,700	319,400
North Carolina	128,300	127,700	257,600	129,900
North Dakota	24,800	24,300	37,900	13,600
Ohio	213,700	212,700	424,000	211,300
Oklahoma	63,700	63,400	113,000	49,600
Oregon	45,600	45,800	90,700	44,900
Pennsylvania	237,700	236,200	469,800	233,600
Rhode Island	58,300	58,400	104,600	46,200
South Carolina	81,700	80,500	154,100	73,600
South Dakota	26,300	26,100	40,400	14,300
Tennessee	103,900	104,100	203,500	99,400
Texas	204,200	205,200	411,100	205,900
Utah	31,400	31,200	51,200	20,000

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

State or Territory	1966 Allocations	1967 Allocations	1968 Allocations	Increase over 1967
Vermont	26,000	25,700	42,000	16,300
Virginia	104,200	103,000	202,400	99,400
Washington	65,100	64,200	122,100	57,900
West Virginia	57,000	57,100	106,600	49,500
Wisconsin	101,300	101,300	187,200	85,900
Wyoming	17,700	17,600	23,500	5,900
Guam	40,800	40,900	71,700	30,800
Puerto Rico	100,900	101,200	191,000	89,800
Virgin Islands	<u>40,000</u>	<u>40,200</u>	<u>70,100</u>	<u>29,900</u>
Total	4,700,000	4,700,000	9,000,000	4,300,000

Basis for allocation:

1. \$12,000 basic grant
2. Remainder: $\frac{2}{3}$ population weighted by per capita income
 $\frac{1}{6}$ population density
 $\frac{1}{6}$ No. of "wet" industries

Allocations to Interstate Agencies

	1966 Allocations	1967 Allocations	1968 Allocations	Increase over 1967
New England Interstate Water Pollution Control Commission	\$40,600	\$40,600	\$135,700	\$95,100
Connecticut New Hampshire				
Massachusetts Rhode Island				
Maine New York				
Vermont				
Ohio River Valley Water Sanitation Commission	92,000	92,100	305,300	213,200
Illinois New York				
Indiana Kentucky				
Ohio West Virginia				
Pennsylvania Virginia				
Delaware River Basin Commission	40,000	40,000	132,900	92,900
Delaware New Jersey				
New York Pennsylvania				
Interstate Sanitation Commission	65,200	65,200	218,100	152,900
New York Connecticut				
New Jersey				
Klamath River Compact Commission	7,500	7,500	27,500	20,000
Oregon California				
Interstate Commission of the Potomac River Basin	22,300	22,200	73,900	51,700
District of Columbia Virginia				
Maryland West Virginia				
Pennsylvania				

Allocations to Interstate Agencies--continued

	1966 Allocations	1967 Allocations	1968 Allocations	Increase over 1967
10. Bi-State Development Agency Illinois Missouri	17,000	17,100	56,500	39,400
15. Tennessee River Basin Water Pollution Control Commission Tennessee Mississippi Kentucky	15,400	15,300	50,100	34,800
Total	300,000	300,000	1,000,000	700,000

Basis for allocation:

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

Comprehensive Basin Planning Grants

Comprehensive basin planning grants: FY 1967, -0-; FY 1968, \$1,000,000; Increase, \$1,000,000. The increase consists of:

\$1,000,000 to provide grant support for 20 new basin planning agencies.

Need for Increase

The \$1,000,000 requested is to provide grant support for 20 new basin planning agencies anticipated to be organized and approved for the purpose of developing an effective comprehensive water quality control and abatement plan for a basin. Congress recognized the need for local institutional planning agencies by authorizing this new program when it passed the Clean Water Restoration Act of 1966.

Objective

Section 3 of the Federal Water Pollution Control Act provides for grants not to exceed 50% 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 for 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, and agricultural, industrial and other legitimate uses.

Grants may be given to an approved agency for a period not to exceed three years.

Program of Work

In 1968 the total estimate of \$1 million is anticipated to support 20 basin planning agencies.

2. Direct operations

(a) Comprehensive planning, management, and assistance

Analysis by Activities

	FY 1966 Amount <u>Available</u>	FY 1967 Amount <u>Available</u>	FY 1968 <u>Estimate</u>	Increase (+) Decrease (-) Over 1967
Comprehensive basin programs.....	125 534 \$6,672,397	126 736 \$9,493,740	126 736 \$9,150,000	--- -\$343,740
Water quality standards development.....	27 15,000	42 258,000	62 648,000	+20 +390,000
Estuary studies.....	...	...	20 970,000	+70 +970,000
Technical assistance.....	226 1,700,505	241 2,833,000	309 3,065,000	+68 +232,000
Pollution surveillance.....	122 1,170,197	133 1,404,000	189 1,936,000	+56 +532,000
Training.....	47 525,474	65 762,000	99 1,000,000	+34 +238,000
Economic and manpower evaluation.....	...	...	12 400,000	+12 +400,000
Control of pollution from Federal installations.....	50 74,444	78 680,000	78 750,000	--- +70,000
Unobligated balance lapsing.....	831,231	...	...	...
Total.....	1,006 10,989,248	1,295 15,430,740	1,505 17,919,000	+210 +2,488,260

Comprehensive Basin Program

Comprehensive basin programs

Analysis by activities

	<u>FY 1966</u> <u>Amount</u> <u>Available</u>	<u>FY 1967</u> <u>Amount</u> <u>Available</u>	<u>1968</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1967</u>
Program direction and basin planning assistance.....	201 \$878,000	101 \$822,000	134 \$1,145,000	133 +\$323,000
Water resources projects.....	39 435,000	65 718,000	65 769,000	--- +51,000
Comprehensive projects.....	421 5,359,397	570 7,953,740	537 7,236,000	-33 -717,740
Total.....	534 6,672,397	736 9,493,740	736 9,150,000	--- -343,740

Program direction and basin planning assistance: FY 1967, \$822,000;
FY 1968; \$1,145,000; Increase, \$323,000. The increase consists of:

- 134
- (1) An increase of \$336,000 to provide for basin planning assistance and grant management activities for a total program of \$1,145,000.
 - (2) A decrease of \$13,000 for nonrecurring equipment costs.

Need for Increase

An increase of \$105,000 and 33 positions is requested to meet the increased workload anticipated as a result of the Clean Water Restoration Act of 1966. The Act instituted a new grant program which provides financial assistance to agencies established for the purpose of developing and planning a comprehensive water quality control action program for a specific river basin. New Federal responsibilities in administering this grant program will include technical advice and assistance to basin agencies in organizing and planning, review and evaluation of proposed basin planning activities, and administration of grant funds. The basic FWPCA position will be one of providing assistance and encouragement in establishment of planning agencies, and guidance and review of applications for planning grants to assure that only useful and productive activities will be funded.

A considerable amount of activity is expected even prior to the establishment of basin agencies and receipt of applications for grants. Agencies in the formulative phase will undoubtedly be requesting advice and assistance concerning means of proceeding. In addition, those already established will also seek aid in specialized aspects of plan development. Federal guidance and participation in the new planning grant program will be met to the extent possible by utilization of all existing staff available. However, due to commitments and schedules for coordinated Interagency River Basin Planning under the Water Resources Council and for other Federal comprehensive program activities under Section 3.(a) of the Act, and because of incomplete geographic coverage by such projects, additional staff is needed to meet this problem.

An additional \$231,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

Section 3 of the Act provides for the development of comprehensive water pollution control 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 legislative history underlying passage of the Clean Water Restoration Act of 1966 places an important mandate on the Federal Water Pollution Control Administration to orient pollution control in the United States towards a basin-wide basis. Effective planning will be essential to assure that the massive Federal investment in the costs of abating pollution provided for in the Act will yield optimum returns in cleaning up entire stream systems. The comprehensive program activity will be the focal point for this effort.

The specific objectives are as follows:

(a) Provide a comprehensive guide to pollution control actions--both immediate clean-up needs and long-range preventive measures--necessary in each major river basin. 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.

(b) Participate in Federal interagency water resource planning, as coordinated and scheduled by the Water Resources Council.

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

(d) Advise Federal construction agencies concerning the need for and value of storage for quality control in Federal reservoirs.

Program of Work

This activity includes headquarters direction of the program and establishment of a small staff planning competence in each regional office which will have responsibility for spearheading reorientation of the program towards the basin-wide approach as mandated by the 1966 legislation. This will involve emphasis on developing outlines of basin-wide pollution control action programs which can be implemented immediately, on providing technical guidance to basin planning agencies, and on relating State-local planning efforts to Federal planning. These staffs will strengthen and complement the more detailed technical work of the individual comprehensive projects.

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 the Act and prescribed regulations. Proposals for grants will be reviewed carefully to eliminate unnecessary studies and to evaluate adequacy or inadequacy of others.

In most basins State and local planning efforts may not be organized for some time to come. In such cases, the Federal program must spearhead the planning task on its own in order to put pollution control on a basin basis in the shortest possible time.

Headquarters activities will involve program review and guidance, and development of new policies and methods to accomplish the objective of basin-wide control programs. 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 individual comprehensive projects and instruct and guide field personnel in the application of new computer programs and systems analysis techniques.

This activity will also provide necessary reviews and comments on water and related land resource development proposals in project reports under Interagency Review Procedures and Executive Order 11288.

65 pgs
Water resources projects: FY 1967, \$718,000; FY 1968, \$769,000; Increase, \$51,000. The increase consists of:

- (1) An increase of \$70,000 for positions authorized to be filled in 1967 and related costs for a total program of \$769,000.
- (2) A decrease of \$19,000 for nonrecurring equipment costs.

Objective

Advise Federal construction agencies concerning the need for and value of storage for water quality control in Federal reservoirs as provided by Section 3.(b) of the Act.

Program of Work

Studies will continue to be carried out for Federal construction agencies concerning need for and value of storage for quality control in reservoirs. This will include assembling information on the physical, economic and demographic environment, water use and waste production, present uses, and estimating the ways in which these are expected to change in the future. Based on the anticipated future waste treatment, available streamflows and assimilative capacity, the need for storage to maintain water quality necessary for possible beneficial uses is determined. Benefits resulting from proposed quality control are determined directly or by alternative cost procedures. The information is assembled in a report for use of the construction agencies in formulation of their reports on water resources development.

In 1968 it is anticipated that approximately 50 projects will be studied. Over the past 5 years the FWPCA has carried out 183 studies for the Corps of Engineers and 66 studies for the Bureau of Reclamation. These studies have recommended inclusion of storage for water quality control in projects. The recommended storage would result in annual benefits of \$27,681,300 per year.

57 pos.
537 pos.
Comprehensive projects: FY 1967, \$7,953,740; FY 1968, \$7,236,000; Decrease, \$717,740. The decrease consists of:

- 33 pos.* (1) An increase of \$677,000^{*33 pos.*} for on-going comprehensive projects and initiating action programs in two others for a total program of \$7,236,000.
- (2) A decrease of \$685,740^{*66 pos.*} for three projects partially phasing out (Chesapeake Bay-Susquehanna, Columbia and Great Lakes-Illinois River Projects). *9 pos.* *14 pos.* *33 pos.*
- (3) A decrease of \$709,000 for nonrecurring equipment costs.

Need for Increase

10 pos. An increase of \$112,000 and 33 positions is requested to provide for accelerating planning activities in two comprehensive projects recently initiated--New England (1967) and Upper Mississippi (1967)--and initiate two new ones--Middle Atlantic and Western Gulf. An additional \$565,000 is requested for positions authorized to be filled in 1967 and related costs. *9 pos.*

Objective

The individual comprehensive projects will continue to provide the basis for undertaking detailed technical planning studies of complex pollution and hydrologic situations, to participate in interagency water resources planning, including work with the river basin commission established under the Water Resources Planning Act of 1965, and providing the solid factual base which will both guide the overall Federal pollution control effort in each basin concerned, and for effectively reviewing basin planning agency proposals.

For the purpose of establishing comprehensive projects, the Nation has been divided into 20 major river basins. (See map on page 61). Projects were under way in 13 of the basins in 1967. The enforcement project in the Colorado Basin is also providing comparable data for that basin. In 1967 the efforts of these projects were reoriented to emphasize the need to develop basin-wide action programs which could be implemented immediately through the use of grant funds and other authorities in the Federal Water Pollution Control Act, and which could also serve for review of water quality standards for interstate waters prepared under the Water

Quality Act of 1965. In addition, there will be a need for selected detailed long term technical studies required to develop optimal solutions for complex pollution situations. These will be done simultaneously with development of interim action plans to meet obvious and immediate abatement needs.

By 1968 reorientation of project activities to completely reflect the new demands of the 1966 legislation is expected to have been accomplished. Pending accomplishment of this, funding and staffing proposals have been minimized consistent with overall need to emphasize the basin approach as rapidly as possible.

Through 1967 the program has projects covering the following major river basins:

- Arkansas-Red River
- Chesapeake-Susquehanna
- Columbia
- Great Lakes-Illinois River
- Delaware Estuary
- Ohio
- Southeastern
- Hudson-Champlain
- Central Pacific
- Missouri
- Lower Mississippi
- Upper Mississippi
- New England

In 1968 it is proposed to initiate, at a minimal level, projects encompassing the Middle Atlantic and Western Gulf Basins.

Middle Atlantic Basin

The majority of the population relies on the surface water resources of the area for water supply; however, groundwater serves a great many of the smaller municipalities. Increases in municipal and industrial water use, together with continued reliance on the capacity of area streams to assimilate a large proportion of the resultant wastes, have created a trend of water quality degradation in many watersheds.

Emphasis in this first year will be on detailed planning of future project needs to promote reversal in quality degradation trends in critical watersheds. The project also will assume FWPCA responsibilities in development of the North Atlantic Region Type I Coordinated Comprehensive Framework Survey.

Western Gulf

The State of Texas is preparing a State-wide plan for development of its water resources for the maximum benefit of the State, and recognized that water quality is of major importance to the success of the development. The plan will include proposals for extensive water impoundments, transbasin transfers, and will identify anticipated future water requirements including those for the maintenance of water quality. In addition, the Corps of Engineers, the Bureau of Reclamation, and the Soil Conservation Service are proceeding with detailed planning for impoundment and diversion structures. Because of the immediate need to influence this planning, a very important part of our comprehensive program will be to evaluate the effects of various water resources development schemes on water quality and on pollution control requirements.

Comprehensive Projects

Program of Work and Accomplishments

Arkansas-Red River

The report on the investigation of salt pollution control needs, conducted in cooperation with the Corps of Engineers, was completed in 1964. The Texas legislature has established the Red River Authority, which has brought about the leveling of 21,000 oil well brine pits. Oklahoma has issued "no pit orders" in several areas of southwest Oklahoma with comparable results.

The Public Works Committee of the Senate directed the Corps to investigate possible methods of reducing contributions of natural brines. A pilot test has successfully controlled one source that was adding 500 tons of brine per day to the Red River. The Corps is proceeding to obtain authorization for construction of control structures on other brine sources, estimated to total \$271 million. The project is participating in developing these plans.

Statistical analysis of alternative monitoring programs to determine required frequencies of stream sampling and methods of data treatment necessary to evaluate brine pollution abatement will be complete by the end of 1967.

Great Lakes-Illinois River Basins

Through 1967 accomplishments include:

1. Completion of investigations in Lake Erie, Lake Michigan and the Illinois River Basin. The comprehensive plan for pollution control of the Illinois River Basin already is undergoing partial implementation by the agencies affected. Moreover, the study of this basin provided the facts needed for use by the Department of Justice and the Special Master to the

U. S. Supreme Court in the Lake Michigan water diversion litigation between Illinois and other Great Lakes States. Reports to the Department of Justice have been prepared and have been introduced as evidence, along with expert testimony by project personnel in this litigation.

2. Conduct of intensive studies of the Lake Ontario and Lake Huron Basins. Project schedules call for completion of the development of comprehensive plans by 1968.

3. A plan for the study of the Lake Superior Basin. Water quality deterioration caused by eutrophication, combined sewer discharges, channel dredging for navigational purposes, land runoff, and diversion of water from the lakes and wastes and flood waters away from the lakes (all highlighted by recent enforcement conferences) are some of the difficult problems that this project has had to deal with in a timely manner.

4. Support for Federal enforcement actions. Data collected from the Lake Michigan studies have been used in the preparation of a report on the interstate pollution of the Calumet area. This report was the basis of Federal action in the Calumet Enforcement Conference held at Chicago on March 29, 1965, in which interstate pollution from Indiana to Illinois, and from Illinois to Indiana was established. The project is also providing extensive technical support to the conferees to assist in carrying out the recommendations of the conference. In addition, data collected from the Lake Erie studies have been used in preparation of a report on the interstate pollution and Ohio intrastate pollution of Lake Erie and its tributaries. This report was the basis for Federal action in the Lake Erie Enforcement Conference, called at the request of Governor Rhodes of Ohio, and included the States of Michigan, Indiana, Ohio, Pennsylvania, and New York. The conference, held in Cleveland, on August 3-6 and reconvened in Buffalo on August 10-12, 1965, resulted in determination of interstate pollution affecting all of the above States and a significant determination that this pollution was the result of discharges of nutrients to Lake Erie by municipalities and industry.

By 1968 a large part of the comprehensive water pollution control program for the Great Lakes-Illinois River Basins will be complete. Assessing water quality improvements, stimulating improvement in waste treatment facilities, monitoring the quality of municipal and industrial waste effluents and intrastate waters to tie into the water quality standards surveillance network, will be programmed in the Lake Michigan-Illinois River and Lake Erie Basins.

Chesapeake Bay-Susquehanna River Basin

The project, in 1967, has reached two different points in its activities in each of its principal subareas.

In the Susquehanna Basin, inventory of existing information and intensive field investigations in each area, except that related to pollution from mine drainage, are essentially complete. Interim reports are being completed in 1967. These reports will delineate the current situation and recommend action for control of pollution to satisfy the requirements of present and short-term goals in these streams. They will be sufficient to guide management action to control pollution from community and industrial waste sources except in the case of mine drainage pollution. In 1968 the staff will develop recommendations for action to meet the long-range requirements for quality control in the Susquehanna River Basin.

In the Chesapeake Bay, activities through 1967 have primarily been concerned with pollution problems in the Potomac River Basin. Inventory and field investigations are proceeding in the remainder of the study area with principal emphasis upon the James River Basin. A significant element in the project's effort in the Chesapeake area has been the development of mathematical models to simulate and predict the effects of waste discharge upon the quality of the water in the tidal and estuarine segments of these river systems. An interim report for the Interagency Task Force on the Potomac River includes data and interpretations developed by this project.

Pressures for concentrated action and reports in the Potomac Basin, including the special study of the Rock Creek subbasin, has curtailed the activities in the remainder of its study area.

In 1968 the project will continue its cooperative work with other Federal agencies in the North Atlantic Region Type I Coordinated Comprehensive Framework Survey and a windup of the Susquehanna River Basin Type II Detailed Survey. Water quality management programs will be completed for the Susquehanna River Basin, the James River Basin and the Potomac River Estuary. Investigations will be under way in the York River Basin and in the remaining estuarine and near-shore areas of the Chesapeake Bay. Emphasis will continue on determining what corrective actions are required to clean up the Potomac.

Delaware River Basin

Major emphasis of the project has been shifted from field investigations to computer analysis and cost of various water pollution control programs. All field work was completed in 1966 and activities were begun on the formal compilation of the comprehensive program for water pollution control. The report on the water pollution control needs in the Delaware Estuary was released in 1967, and is forming the principal basis for formulating water quality standards. This project has been outstanding in its application of systems analysis techniques to water quality management in a complex river basin. Its high speed mathematical model has been used to provide the forecast information required to combat the problems created by the drought conditions in the Northeastern States.

Columbia River Basin

In 1967 pollution control programs will have been developed in the majority of the subbasins. The construction of municipal waste treatment facilities in the Pacific Northwest is approaching an overall biochemical oxygen demand reduction of 60-70%. Major industrial waste treatment improvements are currently being designed in the Willamette, Snake, Walla Walla, and Yakima river basins. The Columbia River Basin Project has stimulated State and local interest in industrial waste treatment in these basins.

What can be accomplished in pollution control within the concepts of comprehensive program development was well demonstrated by this project's handling of the Willamette River water quality emergency in August 1965. The fall salmon run, very important to commercial and sports fishermen, was seriously threatened that year by low dissolved oxygen in the river as a result of abnormally low runoff conditions in the basin. By combining the few existing water quality monitors and a mathematical model of stream quality responses to flow and pollution loads, the Columbia River Basin Project foresaw the critical quality conditions. Interested agencies were assembled and informed of the situation and of the alternate courses of action.

Consensus was reached on an optimum combination of actions and on each agency's participation. Monitoring equipment and a computer were put to work together with short-range forecasts of streamflow and quality to seek day-by-day reservoir releases from power storage that accommodated the salmon run and at the same time minimized the reduction in power revenues that would have otherwise occurred.

Southeastern River Basins

The project, in its three years of operation, has sparked an awareness of water pollution control planning in the Southeast. A number of committees have been established in different geographical areas to implement the plans. Detailed planning is under way in Mississippi.

Many streams in the Southeast are unique in the dearth of factual data on pollution loads and stream quality on which to establish water quality standards and develop action programs. In 1967, major emphasis is on obtaining this essential information and on defining immediate pollution control needs throughout the project area. Economic base studies are complete or under way for all portions of the project area, and breaking down basin-wide projections and application of data to specific water supply and pollution control requirements are under way.

Ohio River Basin

By the end of 1967, comprehensive planning activities will be well under way for most subbasins in the project areas, and interim reports will have been completed for several of the subbasins. Much of the project resources has been directed to cooperation with other Federal agencies in the Ohio River Basin Type I Coordinated Comprehensive Framework Survey and the Wabash and Kanawha Type II Detailed Surveys. Concurrently, the project's activities in Appalachia have been reoriented and accelerated to meet the requirements of the U. S. Army Corps of Engineers for water resource studies under the Appalachian Regional Development Act of 1965. The Ohio project has been responsible for most of the water pollution control studies in Appalachia, since 66 percent of the counties in that region are in the Ohio River Basin.

As of September 1966, industries and communities were planning to spend \$587 million for waste treatment in the Ohio Basin. The legislation passed by the Commonwealth of Kentucky, July 1, 1966, reflected the influence of preliminary findings of the projects with respect to needs for municipal and industrial water supply storage in Federal reservoirs.

The project has cooperated with Ohio and Pennsylvania by furnishing water quality data on Mahoning and Great Miami River to assist them in establishing water quality criteria. This involved changes in field survey schedules to obtain the desired information.

In 1968 the project will continue its cooperative work with other Federal agencies in winding up the Wabash and Kanawha Type II Detailed Surveys. Activities required by the Appalachian Regional Development Act will be completed. By the end of the year, plans for controlling present and future pollution will be developed in about one-half of the Upper Ohio River Basin and interim reports will be in preparation for the Wabash, Miami and Little Miami River Basins. Financial support will be provided to other Federal agencies for ground water, aquatic life and recreation studies.

Hudson Champlain and Metropolitan Coastal

During 1965 and 1966 the project experienced intensified impetus in the need for water pollution control in this region. Several activities and circumstances arose which made it necessary for the project to actively participate in such programs and adopt them as part of its program. The Northeast drought, an enforcement conference on the Hudson River, and the passage of a large bond issue by the State of New York have made it evident that the project will be faced with an increased water pollution control activity from now on.

Evaluation of existing data has been completed and field study programs have been initiated throughout the area with particular emphasis on metropolitan waters; laboratory facilities have been developed to support field activities; and economic studies, water use studies, industrial waste surveys and upland freshwater area studies have been initiated. Mathematical models of stream quality response to alternative pollution controls of the Hudson and Hackensack Rivers are complete. Special attention has been given to combating northeast drought problems.

Missouri-Souris-Red Rivers

Through 1967 major project effort has been devoted to cooperation with other Federal agencies in the Missouri River Region Type I Coordinated Comprehensive Framework Survey.

Primary pollution control emphasis was on the Kansas River and Red River of the North. A program office to serve the northeastern portion of the project area was opened in North Dakota. Mathematical models of stream quality response have been developed for these basins as a basis for effective water quality management. Evaluation of the impacts of various management schemes under the Garrison Diversion Project in North Dakota is especially important to land and water development.

Central Pacific

This project was begun in 1966. Initially, work was concentrated on the pressing problem related to the disposal of agricultural waste water from California's Great Central Valley. As the special agricultural waste drainage investigation was concluded in 1967, the project launched selective inventory and hydraulic study programs in the San Joaquin Valley, Sacramento Valley, and southern California. Studies were begun in southern California of the interrelated pollutional and hydraulic problems of recharging groundwater with treated municipal wastes.

In 1968 the project will continue cooperative work begun in 1967 with other Federal agencies in the California Region Type I Coordinated Comprehensive Framework Survey. Also, during 1968, study of the San Francisco Bay-delta area will be completed and mathematical models for analysis of alternative water quality management schemes will be under preparation. Examination of biological responses to nutrient enrichment and pesticide pollution will be continued.

Lower Mississippi River

The technical assistance project on the lower main stem was phased into the development of a comprehensive water pollution control program for the lower Mississippi River Basin at the end of 1966. In 1967 the staff, equipment and facilities, as well as much of the information developed in connection with the technical assistance study of pesticide pollution, provided a ready-made nucleus for the comprehensive project.

In 1967, the project was oriented along lines to serve the following functions:

1. Correcting obvious sources of pollution.
2. Serving as a resource on the standards provisions of the Act and carrying out Federal responsibility for surveillance, investigation and recommendation of enforcement action where necessary.
3. Planning and implementing those activities which would present practicable programs for the continuous protection and enhancement of the water resources in the program area.
4. Coordinating the water quality control aspects connected with the Corps of Engineers or other civil works projects with the clean river approach to basin planning and operations.

Top priority has been given to the main stem and tributaries from Cairo, Illinois, to Helena, Arkansas because of the immediacy of need, public concerns, and construction grant applications.

In 1968 emphasis will be on the Red-Ouachita-Atchafalaya Rivers to accommodate scheduled requirements relative to the navigation and coordinated interagency planning on the Red River below Dennison Dam.

New England River Basins

During 1967, activities included evaluation of existing data and formulation of work plans, completion of work arrangements with other Federal and State agencies and formation of coordinating committees.

In 1968 an action program will be developed for immediate implementation and selected technical studies determined and initiated as needed. A substantial portion of project resources will be devoted to continuing cooperation with other Federal agencies in the North Atlantic Region Type I Coordinated Comprehensive Framework Study and the Connecticut River Basin Type II Detailed Survey.

Upper Mississippi River

This project was initiated in 1967 and utilized residual staff from the Twin Cities-Upper Mississippi River Enforcement Project as the latter phases out. Project activity during this first year of operation involved primarily providing technical support to implementing the stream quality standards provision of the Act, identifying immediate pollution control needs, and detailed planning for subsequent course of the project.

In 1968, the project will continue its cooperative work begun in 1966 with other Federal agencies in winding up the Upper Mississippi River Region Type I Coordinated Comprehensive Framework Survey. Selected field investigations will be initiated in the headwaters area of the basin. The need and scope of these studies will be determined by the program developed in 1967.

Comprehensive Projects
(dollars in thousands)

	<u>1966</u>		<u>1967</u>		<u>1968</u>		Increase (+)	
	<u>Actual</u>		<u>Estimate</u>		<u>Estimate</u>		<u>Decrease (-)</u>	
							<u>Over 1967</u>	
Arkansas-Red.....	8 \$95	9	\$125	9	\$125	--	...	
Chesapeake-Susquehanna.....	46 706	55	856	36	703	-19	-153	
Columbia.....	32 342	33	442	19	359	-14	-83	
Great Lakes-Illinois River.....	120 1,665	116	1,534	83	1,084	-33	-450	
Delaware.....	11 153	10	151	10	151	--	...	
Ohio.....	82 819	100	1,155	100	1,166	--	+11	
Southeastern.....	45 563	51	902	51	779	--	-123	
Hudson-Champlain.....	57 657	83	1,005	83	955	--	-50	
Central Pacific.....	10 192	28	412	28	480	--	+68	
Missouri.....	10 167	26	571	26	540	--	-31	
Lower Mississippi.....	...	40	374	40	372	--	-2	
Upper Mississippi.....	...	10	227	19	188	+9	-39	
New England.....	...	9	200	19	274	+10	+74	
Western Gulf.....	...	...	...	7	30	+7	+30	
Middle Atlantic.....	...	...	...	7	30	+7	+30	
Total.....	421 5,359	570	7,954	537	7,236	-33	-718	

COMPREHENSIVE PROGRAMS

MAJOR RIVER BASINS



Water Quality Standards

42 pos.
62 pos.

Water quality standards development: FY 1967, \$258,000; FY 1968, \$648,000; Increase, ^{+ 20 pos.} \$390,000. The increase consists of:

- (1) An increase of \$392,000 to meet the full impact of the water quality standards provisions of 1965;
- (2) A decrease of \$2,000 for nonrecurring equipment costs.

Need for Increase

\$130,000 and 20 positions will permit the activity to meet the additional work load anticipated as a result of the Water Quality Act of 1965. The resources must be increased to provide for:

- (1) Immediate and effective review of standards submitted by the States.
- (2) Submitting recommendations to the Secretary for his approval.
- (3) Initiating the establishment of standards where applicable. A heavy work load will be caused by the need to hammer out specific problems posed by the individual waters and the present lack of criteria upon which Federal values will be based.
- (4) Reviewing new and existing scientific and technical information for standards decision making purposes.
- (5) Participating in establishment of adequate surveillance of water quality standards.
- (6) Initiating programs to provide continuing technical policy assessment of standards in light of new technological information and new water uses.
- (7) Directing the compilation of existing water quality data on interstate waters, when needed, to establish base line information.
- (8) Investigating and reporting on the States of implementation and compliance of water quality standards of the various State and Federal agencies for the purpose of upgrading the water quality as well as preventing pollution before it starts. Assist the States in revision of standards and implementation plans, and give guidance in the enforcement programs.
- (9) Coordinating and administering the activities of the National Technical Advisory Committees.

(10) Preparation of reports based on the findings and recommendations of the National Technical Advisory Committees.

(11) Initiating a program to develop a library of scientific and technical information appropriate for standards decision making purposes and to make this information available to the States and other Federal agencies under a continuing program of assistance.

(12) Establishing effective liaison with all water resources agencies, State and Federal, and all agencies involved with water quality and use.

An additional \$262,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

This program has the highest priority because water quality standards will establish the goals and objectives for water pollution control on interstate waters and will, in large part, guide both Federal and State abatement programs. The establishment of standards involves breaking new ground with many difficult technical and policy issues to be resolved. Establishment and maintenance of standards will be a continuing process with periodic revisions and improvements as necessary. However, what is done in the initial years will be extremely important in laying the ground for subsequent efforts.

These standards are not being established for use primarily as an enforcement tool but as an additional tool for the Secretary and State and local agencies to guide their overall abatement programs and encourage preventive control.

Generally, the water quality standards provisions call for the following:

(1) Within one year from date of enactment, each State must file with the Secretary a letter indicating its intent of establishing standards by June 30, 1967.

(2) Standards established by the State must be approved by the Secretary.

(3) If a State does not act either by filing a letter of intent or subsequently establishing approved standards, the Secretary could, after a conference with all interested parties, publish Federal water standards for a particular interstate stream or portion of it. The State would still have 6 months to establish its own standards, subject to the approval of the Secretary, before promulgation by the Secretary. After promulgation, a Governor may request a hearing within 30 days by a board dominated neither by the State nor Federal Governments.

(4) Once standards are established either by State or Federal action, any violator of a standard has six months to conform. If they do not conform, court action can be instituted to force compliance.

(5) The Secretary may, on his own initiative or at the request of a Governor, institute enforcement proceedings against any polluter violating established standards.

(6) Provisions are also included for revising standards consistent with the needs of the State either on the Secretary's initiative or at the request of a Governor.

Program of Work

Standards submitted by the States will be reviewed and recommendations concerning their approval made to the Secretary of the Interior. As many of the States are expected to submit their standards close to the deadline of June 30, 1967, a heavy work load in reviewing standards is anticipated for the first half of the fiscal year.

Federal action will be initiated to establish standards for those interstate streams and coastal waters where unsatisfactory or no standards have been submitted by the States.

Assure that all new scientific and technical information will be evaluated and incorporated into the decisions made with respect to approved standards. During 1968 this will involve reviewing and evaluating a heavy backlog of information which has not been done since the publication of "Water Quality Criteria" in 1963. This activity also will involve continuing the work of the National Technical Advisory Committees.

Participate in design and evaluation of a monitoring system to assure adequate surveillance for compliance with water quality standards.

Initiate a program to provide a continuing technical policy assessment of water quality standards for achieving desired results in pollution control. Since this is a new endeavor, careful attention will have to be given to its effectiveness in achieving the desired

objectives of pollution control. It is anticipated that such evaluation will demonstrate the need for certain review and improvements. It is not anticipated that any specific reviews will be initiated in 1968, so soon after the initial establishment of standards. However, the ground work must be initiated during this fiscal year.

Provide for the conduct of stream surveys to obtain water quality data in interstate streams where existing quality data is not available. The need for this activity will be documented by the supporting data submitted by the States with their standards. The data obtained by this activity will establish base line information from which the established standards can be applied.

Initiate a program of periodic reports on the status of compliance with water quality standards and the implementation plans to achieve water quality standards which have been developed by the States. These reports will be prepared by regional personnel and will be developed for each major river basin. To meet this anticipated effort, additional staff is necessary both at headquarters and in the field.

Accomplishments

During 1966 the Administration's basic policies with respect to standards were formulated, the guidelines for establishing water quality standards were promulgated to the States and others concerned, and technical assistance was provided to a number of States. In 1967 there is a heavy workload involved in providing technical and policy guidelines to the States. Five national technical advisory committees have been established and are developing reports on the current status of knowledge concerning water quality requirements for public water supply, agriculture, recreation and aesthetics, industrial water supplies, and fish, aquatic life and wildlife.

In 1967 there is a heavy workload involved in reviewing preliminary water quality standards submitted by State water pollution control agencies. The reviews involve the determination of the adequacy of proposed water quality criteria for interstate streams and the plan for implementing the water quality standards.

A plan for monitoring waste discharges in interstate streams is being developed as a part of the nationwide water quality standards effort. The monitoring plan will provide for the coordination of State and Federal activities.

Estuary Studies

30 pos.
+20 pos.

Estuary studies: FY 1967, -0-; FY 1968, \$970,000; Increase, \$970,000.
The increase consists of:

\$970,000 to implement a study of estuaries as provided
for by the Clean Water Restoration Act of 1966.

Need for Increase

\$970,000 and 20 positions are proposed for implementation of Section 5(g)(1) of the Federal Water Pollution Control Act. This will provide for staffing headquarters and field activities to direct and coordinate information collection and necessary field studies, support of agreements with other Federal agencies, and contracts with other groups for specific inputs needed for a comprehensive report development.

Although limited, preliminary work in this area was done in 1967 as part of the regular activities of the Administration's Technical Services Program. The increase proposed specifically for this purpose is essential for completion of a comprehensive study of the effects of pollution in estuaries by November 1969, as directed by the Water Pollution Control Act.

Objective

Section 5(g) (1) of the Federal Water Pollution Control Act 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, Water Resources Council and any other appropriate Federal, State, interstate or local public leaders and private organizations, institutions and individuals.

Specifically, the Act 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 effect 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. 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 shall be delineated.

The Act also provides that a final report will be submitted to Congress no later than November 1969. To achieve this purpose, the Act specifically authorizes \$1 million annually through 1969.

Program of Work

In 1968 the main thrust of the program is expected to be made through the use of extensive FWPCA contracts with a consortium of technical institutes, public and private agencies and organizations, recognized national experts, etc. This consortium will have a combined capability to assess the extent and impact of the significant aspects of pollution and its effects on the ecological, economic, and demographic factors associated with estuarine zones throughout the United States. Similarly, a companion effort will involve the other Federal agencies which have over the years initiated important investigations having relationship to water quality in the estuarine environment. We would expect to glean valuable inputs from these sources through the mechanism of an interagency task group.

Supplementing these efforts will be selected investigations of particular pollution problems amenable to clear definition and control in representative estuarine areas in the United States using FWPCA field operations in the selected areas as the primary technical resources.

Technical Assistance

Technical assistance

Analysis by Activities

	<i>Pcs</i>	FY 1966 Amount <u>Available</u>	<i>Pcs</i>	FY 1967 Amount <u>Available</u>	<i>Pcs</i>	FY 1968 <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1967</u>
Program direction.....	60	\$527,000	94	\$773,000	104	\$803,000	+10 +\$30,000
Laboratories.....	94	317,000	118	1,574,000	176	1,883,000	+58 +309,000
Projects.....	72	856,505	29	486,000	29	379,000	-107,000
Total.....	226	1,700,505	241	2,833,000	309	3,065,000	+68 +232,000

24 pos. 307 pos. + 68 pos.
Technical assistance: FY 1967, \$2,833,000; FY 1968, \$3,065,000; Increase, \$232,000. The increase consists of:

- 10 pos. 58 pos.
- (1) An increase of \$36,000 for program direction for a total program of \$803,000.
 - (2) An increase of \$321,000 for regional laboratory staffing for a total program of \$1,883,000.
 - (3) A decrease of \$83,000 for special project activities primarily phasing out the Charleston Harbor-Cooper River project in 1967.
 - (4) A decrease of \$42,000 for nonrecurring equipment costs.

Need for Increase

Program direction: An increase of \$26,000 and 10 positions is proposed to augment the headquarters staff for the purpose of strengthening the Administration's technical assistance activities. The additional resources are needed to provide adequate direction and coordination of the Administration's efforts in such areas as:

(1) technical assistance to State water pollution control agencies on water quality standards, and (2) the implementation of the study of water craft pollution, as provided under the Clean Water Restoration Act of 1966.

Moreover, expansion of field activities, particularly those conducted through the regional laboratories, must be directed and coordinated on a national basis, in order that program resources are most effectively utilized in providing engineering and scientific assistance or information to all concerned. An additional \$10,000 is requested for positions authorized to be filled in 1967 and related costs.

Laboratories: \$256,000 and 58 positions are needed to staff regional laboratories to increase the resources available for providing assistance and consultation and to respond quickly and efficiently to the solution of existing or imminent water pollution problems on location in the areas serviced. Emphasis will be on application of existing knowledge to solve specific problems. The increase proposed is for the following laboratories:

Ada, Oklahoma	16	\$55,000
Athens, Georgia	14	64,000
Corvallis, Oregon	14	64,000
College, Alaska	14	73,000
	58	<u>256,000</u>

The increases will provide for staffing these facilities up to their full complement. An additional \$65,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

Section 5 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 letter responses to requests for information on major project investigations involving several years.

Expert consultations and field investigations, as necessary, are provided on specific local and regional water pollution problems by regional offices, field laboratories, the Sanitary Engineering Center, and the headquarters staffs.

The regional water pollution control laboratories planned or constructed will greatly increase the resources available for providing on-the-spot assistance and consultation. The technical assistance staff in these laboratories will be able to respond quickly and efficiently to the solution of existing or imminent water pollution problems on location in the areas serviced by the laboratories. Many requests for technical assistance have already been received by the field laboratories.

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

Program of Work

The 1968 program will provide for strengthening program direction and for scheduling and coordinating laboratory activities. Particular emphasis will be given to supporting the need of the water quality standards provision of the Water Quality Act.

As a result of additional laboratory staffing, capability to respond quickly and efficiently with on-the-spot assistance in the solution of specific local and regional water pollution problems will be greatly increased.

Accomplishments

Examples of technical assistance rendered through the calendar years 1965 and 1966 are as follows:

- (1) To the State of Maine: An evaluation of eutrophication and its causes in Lake Sebasticook, and measures to be taken to control the rate of eutrophication and improve the recreational useability of the lake.
- (2) To New York State: In relation to the New York City water shortage, an evaluation of the economic alternatives for meeting the water supply shortage and preventing future water shortages.
- (3) To the State of California: State Department of Public Health on investigation of diarrhea outbreak at Riverside, California; provided laboratory methods which resulted in isolation of causative organism from sewage.
- (4) To State of Georgia: Investigated with the State and other Federal agencies the potential effects of pulp and paper mill wastes on oysters, other shellfish and fin fish in the Sapelo Sound area.
- (5) To U. S. Army Corps of Engineers: Conducted study and prepared report on the effects of impoundment on water quality on Tuttle Creek and Wilson Reservoirs, Kansas.
- (6) To municipality of Blacksburg, South Carolina: Consultation on taste and odor problem.
- (7) To the State of Arizona: Consultation with State Health Department regarding radium removal from community water supply; laboratory support in the form of radium 226 analyses were provided.
- (8) To the Delaware River Basin Commission: Consultation involving radiological stream standards, their significance and interpretation.
- (9) To the City of Portland, Maine: Provided consultative services relative to the location of a proposed ocean outfall for disposal of municipal and industrial wastes.
- (10) To State of Nevada: Surveyed Las Vegas Wash and Las Vegas Bay--arm of Lake Mead--to evaluate the fertilizing effect of municipal and industrial wastes on the creation of aquatic plant nuisances.

During fiscal years 1966 and 1967 significant steps also were taken toward improving our effectiveness and capacity for conducting intensive investigations and providing basic on-the-spot assistance to Federal, State, and local agencies, and others concerned with water pollution control. The growth of the program during this period was directed primarily at developing and staffing technical assistance activities in the new water pollution control laboratories.

Recreation and water quality studies are being conducted to either (1) evaluate the deterioration in water quality, if any, that results from the intensive use of a watershed and reservoir for recreational purposes, (2) evaluate the feasibility of utilizing treated waste water for recreational purposes, or (3) determine how best to eliminate poor water quality conditions that interfere with recreational uses of water. Two existing studies in each of these areas will continue in 1968.

The Pearl River Project in Jackson, Mississippi is concerned with the first objective--potential quality changes resulting from intensive recreational use of a reservoir. In 1968 the post impoundment study of the reservoir will continue, with a report on special nutrient (nitrogen and phosphorus) studies within the drainage basin scheduled for completion.

A study is being conducted as a joint technical assistance-research project concerned with the poor water quality conditions of Lake Shagawa, Ely, Minnesota which interferes with recreational use of the water. Study of the lake's eutrophication problem will continue in 1968.

Recreation and water quality

The most significant accomplishment of our recreation and water quality studies has been the Santee Recreation Project. This project was designed to determine in the field the optimum procedures necessary to manage water quality through a waste treatment and water reclamation system supplying water for recreational lakes. The project resulted from the need of the San Diego County and California State Health authorities for information about the presence of viruses in reclaimed waters when the Santee County Water District proposed to use its well-treated effluent water for recreational lakes. The extent of the studies incorporated in the final project was broadened to include, along with virus identification, related chemical, physical, and bacteriological pollution indicators as well as an epidemiological record. Separate studies of hydrology, vector control, fish propagation, and aquatic biology also were set up to make more effective use of correlating data obtained originally for the virus study.

The Santee recreational lakes were created to provide a recreational facility using reclaimed water from the community's own sewage treatment plant. The lakes have been used since 1961 for several recreational purposes, starting with activities that were limited to picnicking and boating and then progressing through a "Fish for Fun" program to a general fishing program which was only limited during the spawning season. A special area adjacent to one of the lakes was then used for swimming during the summer of 1965.

The Santee Recreation Project has demonstrated the feasibility and social acceptability of using water reclaimed from sewage as a supply for recreational lakes. The study has further determined that with the treatment provided at Santee, the recreational lake waters did not contain measurable virus concentrations even though virus isolations were made from all samples of raw sewage and from 96 percent of samples of secondary effluent. When additional treatment was provided to meet the water quality standards of outdoor swimming pools, the reclaimed water was used safely for swimming. The public acceptance of this swimming program by more than 3,200 registrants has created national recognition of the project.

It also was demonstrated that nutrients could be controlled to create a balanced chain of producers and consumers that have supported seven types of fish. The study has shown, however, the necessity for controlling the enrichment process for continued fish propagation.

In another area of recreation and water quality, the study of the Ross R. Barnett Reservoir in Jackson, Mississippi (Pearl River Project) afforded us the opportunity to compile water quality data prior to impoundment, thereby permitting direct comparison between preimpoundment and after impoundment water quality. Of particular importance is the quality change, if any, developing from extensive recreational use of the reservoir.

The summer of 1965 was the first recreational season after full impoundment and offered the first opportunity to evaluate the effects of intensive use. Studies to evaluate the effect of power boats on water quality, treatment and/or disposal of sanitary waste and refuse, the effect of concentrated swimming, and the effect of nutrient sources on the biological quality of the reservoir were continued during the 1966 recreational season.

Klamath River Basin Study

This study encompasses two principal problems: (1) the effects of pesticides and other contaminants from agricultural land drainage on the Tule Lake and Lower Klamath Lake National Wildlife Refuges, and (2) an algae nuisance problem in the Upper Klamath Lake and Klamath River.

The scheduled program for 1968 will consist of a continuation of the biological pollution surveys and application of biological data to a computer program for analysis that will reveal water quality trends and permit evaluations, leading to recommendations on agricultural land management and basin water management changes, to improve water quality and reduce or avoid pollution damage. Studies needed for verification of a computer program will be conducted in an effort to make the mathematical simulation of the Lost River system completely verified and operational.

During 1965 and 1966 the study conducted chemical and biological investigations in the Lost River Subbasin in cooperation with the Oregon State Sanitary Authority. Other Federal agencies were utilized to provide monitoring of flows, exploration of the effects of pesticides on selected wildlife, and the effects of pesticides on plants and soils. The program is developing a statistically reliable measurement to peak and mean concentrations of pesticides and water-nutrient accounting system. By the end of 1967 some of the information will be acquired to permit computer analyses by a mathematical model of past, present, and proposed practices of water management in the Klamath River Basin.

Tampa Bay project

A field project to determine the cause of obnoxious odors along the western side of Hillsborough Bay--an arm of Tampa Bay--and to evaluate the Corps of Engineers' hurricane barrier proposals for Hillsborough Bay, from the standpoint of possible effect on water quality, was begun in 1967.

Activities during this first year consisted of establishing physical facilities for the study and initial field work in the bay area.

During 1968 there will be a continuation of studies to determine the cause of obnoxious odors along the western side of Hillsborough Bay. Field studies and report preparation are scheduled for completion by the end of 1968.

Pollution Surveillance

133 pos 189 pos

Pollution surveillance: FY 1967, \$1,404,000; FY 1968, \$1,936,000;
Increase, ^{+ 56 pos,} \$532,000. The increase consists of:

- (1) An increase of \$582,000 for acceleration and pollution surveillance activities for a total program of \$1,936,000.
- (2) A decrease of \$50,000 for nonrecurring equipment costs.

Need for Increase

\$502,000 and 56 positions are necessary to expand the national system of water quality compliance monitoring activities and associated laboratory support involving the full spectrum of chemical, physical, biological, and radiochemical analyses. The Act, as amended, directing the establishment of water quality standards on interstate streams will require a substantial expansion in the number of monitoring stations and support services.

At present, 139 stations are in operation with analytical work performed at a central national facility located in Cincinnati and at four operational regional laboratories. Because of the many uncertainties associated with the proposals about to be received from the States for approval by the Secretary, it is impossible at this time to accurately estimate the eventual requirements for Federal monitoring as contrasted to State monitoring. However, in order to satisfy anticipated technical assistance requests by the States, and to permit the Secretary to act quickly if the States fail to comply with the provisions establishing water quality standards, the program must be prepared to meet a wide variety of potential situations. These will vary from relatively simple periodic grab sampling activities to continuous monitoring with highly sophisticated equipment. Further, at any given location, the array of variables which require monitoring may vary greatly.

The budget increase requested in 1968 results principally from the staffing needs involved in locating, installing, and maintaining new stations, as well as associated analytical laboratory support, data validation, and evaluation. Of the 56 positions requested for the next year, 20 positions will be located in regional offices and laboratories to install and support new stations. Wherever possible, water quality analyses will be conducted on site or at the four regional laboratories in operation. The remaining 36 positions will be located at the central laboratory in Cincinnati which will service those areas not serviced by regional laboratories.

The Cincinnati facilities will conduct complex analyses requiring specialized equipment. Most of these particularly complex analyses are required to enable field staffs of the FWPCA to detect, identify and

measure specific industrial pollutants. These are primarily petroleum materials and the many synthetic organic compounds and associated wastes produced by chemical manufacturing plants and used widely throughout American industry. Once water quality standards are set and violations occur, the agency will need to trace the pollutants responsible to their source.

The designation and approval of water quality standards for the various streams in the country will bring about situations in which pollution is defined as a violation of the standards. The laboratory analyses provided by the FWPCA as evidence of the violation of the standard must be of unquestioned validity. Similarly, the data from laboratories of the States must be comparable among themselves and with FWPCA data.

The budget increase will make it possible to provide a modest laboratory analysis validation program to meet the requirements of the administration. Special attention will be given to intralaboratory quality control. Further, an interlaboratory quality control program will be initiated involving those State and other Federal laboratories with whom FWPCA will be working. Appropriate means will be taken to stimulate the production of professionally certified and validated procedures.

Special efforts will be made to assure that data produced, either by on-site monitors or from any one of the various laboratories concerned in this program, will be stored in the central computer of the Department of the Interior in such a manner that prompt access and evaluation will assure prompt followup action under the compliance and enforcement provisions. An additional \$80,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

Intelligence on the sources, kinds, and amounts of pollutants and their effects on water quality and water uses is essential to an effective water pollution control program. To meet these needs, the program plans, develops, and coordinates mission-oriented activities for the collection, evaluation and dissemination of water quality data and related information. The basic authority for these broad activity areas is found in Section 5 (c) of PL 84-660, as amended. Specific service functions are occasioned by the needs of other FWPCA units and technical assistance requested by State and interstate agencies authorized under other sections of the Act. Intradivision activities and technical services are conducted in support of or as an integral part of four major programs of the Administration: development of comprehensive water pollution control basin programs; water quality standards and plans for implementation; oil pollution control; and enforcement actions. In addition, the products and services of the

program are used in a broad sense throughout the entire field of water pollution control at all levels of government and by all persons and organizations involved in supporting water pollution control activities.

Program of Work

To secure accurate and timely data and information on a national and regional basis as a service function to aid other FWPCA technical programs, and as a technical assistance function to assist State and interstate pollution control agencies, the program will pursue the following work items during 1968:

(1) Water quality compliance system-- A flexible system of water quality monitoring stations, including both laboratory analyses at a centralized laboratory facility and in-stream analyses via automatic monitoring equipment, will be expanded in support of the four major FWPCA programs noted above.

(2) Specialized analytical services and instrumentation--Expert professional analytical services and highly specialized analytical equipment will be made available through the centralized laboratory. Also, the continued development, installation, and operation of appropriate automatic water quality sensing and transmitting instruments will be provided.

(3) Analytical quality control--The reliability of laboratory and field analytical results in the Administration will be assessed and assured. This will include the field testing of new laboratory analytical procedures, and the initiation of a complementary program with State and interstate agencies.

(4) Facilities construction and statistics--Current information on the status of water and waste treatment facilities and related statistics, including fishkills, will be obtained on a national basis.

(5) Data operations, evaluation and control--A computerized system for the timely storage, retrieval, processing, and analysis of necessary water quality data and related statistics will be provided and operated.

(6) Pollution intelligence units at the field level--The service functions of the surveillance program at field level offices and laboratories will be provided with basic staff components.

Accomplishments

Water pollution compliance services

The Water Quality Compliance System currently includes 131 regular and 8 special category stations. Water quality data are being collected and analyzed either automatically or manually on a continuing basis. In the absence of a regional laboratory, those analyses which cannot economically be performed on-site are conducted at the centralized laboratory in Cincinnati.

Raw laboratory data secured through the Compliance System are made available via STORET printouts to State, interstate, and Federal agencies. State water pollution control agencies are currently utilizing these data in their efforts to develop the water quality criteria required, as prescribed by the Act. To the extent practicable, the data are also made available to industries and universities.

The data are under continuous evaluation to signal the occurrence of new pollution sources and abatement of historical pollution. A statistical treatment and selected publication of Compliance System data are approaching completion and will be distributed as rapidly as possible, particularly to State and interstate agencies concerned with developing water quality criteria and implementation plans.

Specialized analytical services and instrumentation

During 1966 and 1967 the specialized analytical support services program demonstrated its ability to completely analyze and identify the components of complex industrial waste streams in support of technical investigations. An example was the thorough study of a plant producing pesticides. This program will continue to provide expert consultative services within the Administration and to State and interstate agencies as resources permit.

In addition, this activity installed automatic water quality monitoring systems, prepared technical specifications and operating manuals, and provided technical consultation to State, interstate and Federal agencies.

The Potomac Water Pollution Monitoring System, currently consisting of four automatic transmission stations connected to a central data logging facility via telemeter lines, was designed and installed. The data logging stations at the John Kerr Dam, Roanoke River, Virginia and at Rome, Georgia, Coosa River, and at other locations were modernized.

Consultation and guidance were provided to the International Joint Commission, Federal agencies, and several FWPCA comprehensive basin programs and enforcement projects requiring automatic monitoring and/or transmission systems.

Technical publications include "Specifications for an Integrated Water Quality Data Acquisition System," "Specifications for Slow Speed Telemetry," and "A Program Guide to Automated Instrumentation for Water Pollution Surveillance." Activities of the type noted above will be pursued on a continuing basis. In addition, attention will be directed to modernizing the organic chemical sampling devices at existing monitoring stations.

Analytical quality control

To assure that the accuracy and precision of all stream quality data collected as part of the Water Quality Compliance System will be acceptable to all regulatory bodies, a modest analytical quality control program was initiated during 1966. During 1967 the selection and publication of tentative agency methods will be initiated. Various organization support questions are currently in the process of resolution. In addition to laboratory quality control programs to assure compatibility within the Administration, a modest interlaboratory quality control program will be initiated among State, interstate and Federal agencies collecting data needed in water pollution control activities. A split-sample testing program will be initiated on an interlaboratory basis during 1967.

Facilities construction and statistics

Periodic publications including "Pollution-Caused Fish Kills" were printed and distributed. Similarly, national data on the financing and construction of sewage collection and treatment facilities were collected, analyzed and published. The biennial inventory of "Municipal Water Facilities, Communities of 25,000 Population and Over," as of January 1966, was undertaken and will be published during 1967. In addition, a revised national inventory of municipal waste facilities will be initiated in the latter half of 1967.

Data operations, evaluation and control

In the field of data operations control, the STORET I system was strengthened and STORET II was developed and made operational. Statistical and summary computer programs for both storage and retrieval subsystems were developed and are being implemented. Reprogramming of the STORET system, in anticipation of late 1967 use of the Department's 360/65 computer center, was initiated and will be completed. Concurrently, methods and programs to provide better operating efficiency and expansion of the STORET system are under development. In addition, map coding, consulting services, specialized programming, manuals development and training of personnel will be pursued on a continuing basis.

Staffing of pollution intelligence units in the field laboratories

Modest staffing was initiated at four operating field laboratories, Corvallis, Oregon; Athens, Georgia; Ada, Oklahoma; and College, Alaska to extend services by providing specialized support to specific basin programs. This initial staffing has made noteworthy contributions in the fields of aquatic biology and automatic water quality data monitoring instrumentation at the regional level.

Training

TrainingAnalysis by Activities

		FY 1966 Amount <u>Available</u>		FY 1967 Amount <u>Available</u>		FY 1968 <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1967</u>	
	<i>Pos</i>		<i>Pos</i>		<i>Pos</i>			
Technical.....	31	\$329,226	34	\$399,000	48	\$477,000	+14	+\$78,000 <i>700,000</i>
Graduate.....	9	126,248	20	247,000	30	350,000	+10	+103,000 <i>10,000 all</i>
Management internship.....		...		...	10	57,000	+10	+57,000 <i>all pos + 6</i>
Training grants administration.....	7	70,000	11	116,000	11	116,000	--	...
Total.....	47	525,474	65	762,000	99	1,000,000	+34	+238,000

34 pos 46 pos +14 pos

Technical training: FY 1967, ¹\$399,000; FY 1968, ¹\$477,000; Increase, ¹\$78,000. The increase consists of:

An increase of \$78,000 to support staffing in regional locations for a total technical training program of \$477,000.

Need for Increase

\$44,000 and 14 positions are proposed for staffing the regional laboratories and the national training center activity in Cincinnati, Ohio. Currently the staff in regional facilities has been limited to the extent that the program has been confined to identifying and assessing training needs and developing courses. Although selected courses have been held, staff is inadequate to schedule a full array of needed courses. In addition to direct training, increased consultation and assistance is needed to be given to the States for training of waste treatment operators. Efficient utilization of waste treatment plants will help reduce pollution.

Additional resources are also needed at Cincinnati for technical and administrative support of the regional laboratories and developing new courses to meet changing technology and personnel needs. The proposed increase will provide three positions each in Ada, Oklahoma; Athens, Georgia; Corvallis, Oregon, one for College, Alaska and a nucleus staff of four positions for Cincinnati, Ohio. An additional \$34,000 is requested for positions authorized to be filled in 1967.

Objective

Provide for the training in technical matters relating to causes, prevention, and control of water pollution to personnel of public agencies and other persons with suitable qualifications in accordance with Section 5(a) of the Act.

In carrying out this objective the program provides students and professionals across the nation with the latest in scientific and technical information for the study and control of water pollution. It provides basic instruction and advanced professional training to Federal, State and local water pollution specialists; industrial representatives; waste water treatment plant operators; and university personnel. It not only raises the professional standards of water specialists but also puts the latest research knowledge into their hands almost as soon as it is available, thus reducing the customary time-lag between research and application.

Training is conducted in various locations to serve specific needs. The main training center is located in Cincinnati, Ohio. Here, training

of a national scope is offered to both Federal and non-Federal agencies and students, including foreign students, concerned with the problem and treatment of water pollution. Advice and assistance is provided States, foreign representatives and others in developing their own training programs. The Center also provides continuing in-service training for Administration employees and develops new courses to meet changing technology and personnel needs.

To meet local requirements, training is conducted through regional laboratories. These facilities extend to the area of service training, which was formerly offered only at Cincinnati and tailor it to the special water problems in each area. In addition to in-service training and assistance to local, Federal and non-Federal specialists, the laboratories also provide consultation and assistance to the States in the training of waste treatment plant operators. This is a specialized and highly important function, since the optimum utilization of Federally financed sewage treatment plants requires a specially trained crew.

Program of Work

In 1968, the training staff in all the laboratories currently in operation will be increased. As training needs become identified and properly assessed in all regions, a full array of scheduled courses will be taught at each water pollution control laboratory. Additional technical and nonprofessional personnel will be needed. This will require an increase in the amount of technical and administrative backup and support services coming from the Cincinnati staff. During 1968, a fully developed schedule of courses will be conducted at the Corvallis, Oregon; Ada, Oklahoma, and Athens, Georgia laboratories. The special needs of the Alaska area should be known by this time with requirements for training spelled out and training begun at this laboratory.

These developments in the training activity and staffing of the laboratories and Cincinnati accounts for the proposed increase.

The following reflects the number of persons estimated to receive training by location:

	<u>1967</u>	<u>1968</u>
Cincinnati, Ohio	450	600
College, Alaska	70	90
Ada, Oklahoma	150	350
Corvallis, Oregon	150	350
Athens, Georgia	<u>50</u>	<u>350</u>
	870	1,740

558-500

Accomplishments

In 1966, the training program continued its activities by providing new and more specialized training courses and services at Cincinnati and by developing two new training activities in Ada, Oklahoma and Corvallis, Oregon. The Cincinnati facility offered a curriculum of 15 courses over 31 weeks in all technical areas of water pollution control; namely, chemistry, biology, microbiology, and engineering. During the latter part of the year, training courses were offered for the first time in two of three regional laboratories where training facilities had been set up.

During 1966, persons receiving training in the professional categories mentioned totalled 318 while approximately 40 additional persons, representing a number of foreign countries, were involved in the training effort. Specialized training was provided, as requested to meet their requirements. Included in the number of persons receiving training is a substantial segment of our own professional staff in the Water Pollution Control Administration.

In 1967, training will continue at Cincinnati, Ada and Corvallis and will be initiated in other regional laboratories as they become staffed. New courses will continue to be developed in response to the changing and expanding knowledge provided through research. With the passage of the Water Quality Act of 1965 and the requirement for establishment of stream standards by July 1, 1967, the training program also must provide specialized courses in the area of automatic field instrumentation for water quality monitoring.

An expanded program will provide training to approximately 400-450 persons at the Cincinnati laboratory. Also, at our current rate, we expect to provide training to about 40 to 50 foreign personnel which may represent as many as ten foreign countries. At both Ada, Oklahoma and Corvallis, Oregon, training will be provided to approximately 300 persons through each facility.

Graduate training: FY 1967, ^{20 pos.} \$247,000; FY 1968, ^{30 pos.} \$350,000; Increase, ^{+ 10 pos.} \$103,000. The increase consists of:

\$103,000 for graduate studies in institutions of higher learning.

Need for Increase

\$103,000 and 10 positions are requested to support training of FWPCA personnel at the graduate levels. New legislation resulting in changes in program concept or emphasis, expansion of complex programs, and rapid technological advances resulting in new research techniques and methods, all impose staffing requirements for highly specialized professional and scientific personnel for which recruiting experience indicates there

are insufficient qualified candidates available to meet immediate or long-range needs of the Administration. Graduate level training provides an opportunity for the Administration to select technical and scientific personnel with high potential for professional development to undertake graduate studies in specialized areas identified as the most critical to the program needs of the Administration.

The proposal represents a nominal increase which will permit the Administration to support a total of 30 professionals in 1968.

Objective

To provide developmental opportunity in highly specialized areas, for selected technical and scientific 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 increase the number of key personnel with advanced training and provide for the development of highly specialized skills, primarily in shortage categories. Most of those who have completed such assignments have progressed to more advanced duty assignments than those held before their training. One of the major benefits obtained from the program is the ability to combine work experience in the field of water pollution control with a sound educational program at the graduate levels.

Program of Work

Responsible officials of the Administration have been requested to review program needs and identify the categories of training which they consider should be supported during Fiscal Year 1968. Based on plans for future expansion, changes in program concept or emphasis, significant changes in organization, functions, research methods, etc., they will determine the most critical training needs of the Administration to provide the current or planned work force with the needed technical, scientific, or professional skills, knowledges, or abilities to meet these changes. On the basis of these recommendations, a long-term graduate training program will be developed for FY 1968 and nominations will be solicited for applicants whose planned graduate program is related to the critical needs of the Administration. It is anticipated that the number of applicants applying will be significantly higher than that of previous years.

It is very evident that the expansion and conceptual changes in the highly complex programs of the Administration are creating a critical need for personnel with highly specialized skills that we will be unable to meet through normal recruitment outside the Administration. Persons of the type needed are in shortage categories in the labor market and are much in demand.

These factors, therefore, make it more apparent than ever before that the Administration must have a planned graduate training program to develop in our own staff the critical skills and knowledges needed to effectively carry out our mission.

Accomplishments

In 1966 a total of 61 candidates submitted requests for long-term graduate training to be conducted during 1966. Of this group, a training committee recommended that 32 be considered. From this group, the Administration supported 9 candidates. Eight were commissioned corps personnel and one was a civil service employee. Some of the programs undertaken by candidates and their placement upon completion of the training included:

(a) Sanitary engineering with a minor in water resources and chemical engineering at Oregon State University. Placement was made in the research division at the Corvallis laboratory, Corvallis, Oregon.

(b) Sanitary engineering with a minor in bacteriology at the University of Wisconsin. Training was completed September 1966 and placement was made in the research division at Duluth laboratory, Duluth, Minnesota.

(c) Sanitary engineering with minors in chemical engineering, chemistry, biochemistry, statistics and operations research at the University of California. Placement in the Southeast Water Laboratory in Athens, Georgia as a supervisory sanitary engineer.

Of the eight commissioned Corps personnel completing their schooling, seven decided to convert to civil service positions and remain with the Administration.

Applications were received from 35 candidates for long-term graduate training in 1967. The FWPCA Training Committee considered the applications and selected 20 candidates who were recommended for participation in the program. These selections were approved by the Commissioner and the Department.

Since the Administration was to be faced with the problem of filling a number of hard-to-fill vacancies resulting from the transfer of commissioned corps personnel back to PHS, the program has been particularly beneficial this year. Of the 20 candidates selected for training, 17 were commissioned officers. Their selection for long-term training was the key factor which affected their decision in converting to civil service positions in the Administration. This factor also affected the decision of a number of other commissioned officers who wanted to be assured that long-term training opportunities would be available in future years before deciding to convert to civil service status.

Some examples of the programs of study which were approved in 1967 and recommended for 1968 that will greatly assist the Administration in meeting critical needs are as follows:

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

(b) Advanced sanitary engineering program which includes water resources engineering, applied chemistry of water and waste water, water purification and treatment, industrial waste treatment, industrial bacteriology and microbiology.

(c) Studies in systems analysis, statistics, water resource economics and regional science combined with seminars and opportunities for independent research. This study will greatly assist in the design and analysis of complex, large-scale environmental systems.

(d) Studies in advanced chemistry with emphasis on organic chemistry. Will aid in the study of organic contaminants which is becoming an increasingly important area in water pollution study.

(e) 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 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 knowledges needed.

(f) Advanced training in economics for sanitary engineer. 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.

(g) Advanced training of scientific or professional personnel in planning, economics, and public administration. 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.

The program of training and development for the interns will provide for (1) orientation to the functions and responsibilities of the Federal Government, the Department and the various components of the Administration; (2) rotational assignments in the areas of financial management, personnel management, contracting, grants management, management systems, general services and other appropriate areas to familiarize participants with the principal administrative and staff management activities of the Administration; (3) substantive work experience within one or more of the above areas to which an intern may be assigned upon completion of training. All assignments will be designed to provide individually tailored progressive learning experience which will equip each trainee to assume higher level administrative and managerial type assignments.

In addition, interns will participate in other appropriate elements of related training such as periodic seminars, selected after-hour academic courses at local colleges and universities, in-service courses (technical and nontechnical), and any interagency courses as available. The length of the program may vary from one year to 18 months depending on the types of assignments in each of the above-mentioned areas. Assignments may include tours of duty at the regional and field activity level as well as at headquarters.

Training grants administration: FY 1967^{11 p. 25.}; \$116,000; FY 1968^{11 p. 25.}; \$116,000; no change.

Objective

Generally, the objective is to effectively and efficiently administer the training grant programs, i.e., fellowships and training grants. In this connection it performs the following:

- (a) Assists applicants in the development of grant proposals;
- (b) Receives and reviews completed grant applications;
- (c) Recommends approved applications for award;
- (d) Authorizes payment of funds;
- (e) Develops and applies policies and regulations;
- (f) Evaluates progress and terminal reports;
- (g) Provides statistical and scientific reports on grant programs;
- (h) Develops information on the status of training for program planning;
- (i) Maintains liaison with the scientific community to coordinate training grant programs.

Program of Work

In addition to performing the functions mentioned under Objective for 165 grants, program administration will be expanded in the following areas:

(a) New program initiation. In 1968 a new program of technical training grants will be developed providing for 7 new technical training projects. Awards will primarily be made for projects which are designed to substantially increase the Nation's resource of trained manpower to support rapidly expanding developments in waste water treatment and water quality management.

(b) Program development. Potential grantees will be visited to stimulate project development in the areas of primary importance to the Administration.

(c) Program review. Active projects will be reviewed or visited by program staff to develop information on training accomplishments not available through progress or terminal reports.

Accomplishments

In 1966, the graduate training grant and research fellowship program provided specialized water pollution control training for 522 graduate students. 142 trainees and fellows completed advanced courses of study. Of those completing advanced degrees, 60% received the M. S. degree while 40% of the advanced degrees were at the Ph.D. level.

In 1967, the program expects about the same level of activity as was experienced in 1966.

10 pos + 10 pos

Management internship : FY 1967, -0-; FY 1968, \$57,000; Increase, \$57,000.
The increase consists of:

\$57,000 for a new training program.

Need for Increase

An increase of \$57,000 and 10 positions is proposed to establish a management internship program. New legislation not only demands an acceleration of program activities of the Administration, but also a major change in program concept in several major areas such as comprehensive planning, grants management, program planning and budgeting. These conceptual changes have created a requirement for additional administrative or managerial personnel with academic backgrounds in such areas as economics, business administration or mathematics, to provide appropriate staffing to respond to the program changes. In addition, the continual shortage of professional personnel requires a restructuring of positions to get full utilization of scientists and engineers in the professional aspects of their work and delegate administrative and managerial responsibilities to nonprofessional staff to the extent possible. To assist in meeting the increased demand for competent, high-level administrative and managerial personnel, also difficult to recruit, it is proposed to introduce young staff members who have demonstrated a high potential for professional growth to the Administration's operations and train them to assume higher level assignments.

Objective

To bring into the Administration on a regular, planned basis, a number of young staff members who have been selected through a sound evaluation process and identified as showing high potential for growth and development in the managerial and administrative fields.

The Management Intern program will facilitate the impact of management trainees into the Administration on a systematic basis. The program will provide for a planned base of work experience and supplemental training designed to provide an accelerated and balanced training and development program to prepare the selected interns for increasing responsibilities in the management field.

Program of Work

Participants in the program will be selected from the management intern registers compiled as a result of the Federal Service Entrance Examination. Others could be appointed if they are carefully screened to assure that their abilities and potential match the high standards established in the Civil Service Commission's management intern examination.

Economic and Manpower Evaluation

12 pos.

Economic and manpower evaluation: FY 1967, -0-; FY 1968, \$400,000;
Increase, \$400,000. The total increase consists of:

+12 pos.

Funding necessary to carry out studies required by the Clean Water Restoration Act of 1966.

Need for Increase

The Act provides for five basic studies for which reports must be submitted to Congress. These are as follows:

1. A detailed estimate of the cost of carrying out the provisions of the Act over the next five years.
2. A comprehensive study of the economic impact on affected units of government of cost of installation of treatment facilities.
3. A comprehensive analysis of the national requirements for and the cost of treating municipal, industrial and other effluent to attain such water quality standards as established by this Act or applicable State laws. (Reports on these first three studies due to Congress no later than January 10, 1968.)
4. A study to determine need for additional trained State and local personnel to carry out programs assisted by this Act and means of using existing Federal training programs to train such personnel. (Report due to the President and Congress no later than July 1, 1967.)
5. An investigation and study of methods of "incentives" to assist industry in the construction of waste treatment facilities and other works to abate pollution. (Report due to Congress not later than January 30, 1968.)

Generally, studies 1 and 4 will be carried out with existing resources. However, the other three studies ^{and} are more complex, and require the need of special competencies and more extensive cooperation on the part of other Federal, State and local agencies and organizations. Therefore, \$400,000 is requested to finance 12 positions, consultants, and costs of acquiring the assistance of other agencies and organizations. In view of the short period of time involved in meeting the reporting dates in 1967, some activity in these areas will also be initiated with existing resources.

Objective

As required by Sections 16 and 18 of the Federal Water Pollution Control Act, as amended, provide Congress with the basis for evaluating authorized programs, development of new programs, and the information necessary for authorizing appropriations beginning with fiscal year 1969, report on additional training need and use of existing Federal training programs, and recommendation for providing incentives to industry to reduce or abate pollution by industry.

Program of Work

The detailed estimate costs study (Study 1) will be made by utilizing the agency's programming, planning and budgeting activities, in addition to other existing resources, throughout the organization. The study will be designed not only to encompass Federal Water Pollution Control Administration needs but also those of State and interstate agencies and other planning agencies for carrying out the provisions of the Act. The studies of the need for additional training of State and local personnel and use of existing Federal training programs (Study 4) will be conducted in cooperation with all agencies concerned and reports submitted to Congress by July 1, 1967.

The studies regarding economic impact on affected units of government of the cost of installing treatment facilities (Study 2) and the national requirements for and the cost of treating municipal, industrial, and other effluents to attain the established water quality standards (Study 3) must be finished and a report and recommendations made to the Congress by January 10, 1968. Studies 1, 2, and 3 will cover the five-year period beginning July 1, 1968.

Study 2 will determine the amount of the funds required by State and local governments to meet their share of the costs of waste treatment and how these funds will be raised. Also, it will estimate the effect on tax levels, debt limits, interest rates, borrowing policy, user charges, and other public facility programs. An important aspect will be to reveal whether State and local laws and regulations impede the financing prospects or affect interest rates.

Study 3 will involve analyzing existing estimates of total costs of treatment facilities to determine their basis and validity. A new estimate will be prepared, taking into account obsolescence rates, upgrading of treatment, extension of service to new areas and to industry, and improvement in process and performance in light of new standards and water quality goals.

During 1967 and 1968, an appraisal of present practices of financing treatment works will be completed, including determination of the extent of borrowing, the use of service charges, property taxes, and other means. The extent of industrial waste treatment in municipal systems and the pricing methods and amounts of revenue obtained from this source also will be determined.

Estimates of the investments required for other public facilities to be financed by the same governments will be obtained from the Joint Economic Committee of the Congress, the Advisory Commission on Intergovernmental Relations, and the National Planning Association to evaluate the competition for funds and the probable effect. An evaluation also will be made of the probable effect on local business taxes and service charges to estimate the reaction of business firms to the cost burdens.

These data and other information will be analyzed and conclusions drawn. The final report with recommendations will be prepared for transmittal to the Congress.

Study 5 requires an investigation and study of "incentives" to assist industry in the construction of waste treatment facilities and other works to abate pollution. The study must cover tax incentives as well as other forms of financial aid. The Secretary of the Treasury and other appropriate agencies must be consulted.

An analysis will be made of the extent to which industry took advantage of tax credits and the accelerated depreciation now provided in present tax law. This analysis will examine the situation for treatment facilities both for the suspension period and for the time prior to the suspension date.

An analysis of State experience under their laws will also be made.

An advisory group of consultants will be established for the major industry categories of heavy polluters and specific questions formulated for study by the consultants.

An estimate of the number and geographic location of "marginal" manufacturing plants from the economic and market standpoint will be made in regard to waste treatment financing problems. The estimate will include the kind of problem, the size of the operation, the location by State and basin, and the relation to market and the nature of the "marginal" condition. The Department of Commerce and the Treasury Department will be especially involved.

Comparisons will be made as to the probable levels of waste treatment investments by industrial sector and by size and age of manufacturing plant and the level of capitalization. These comparisons will also be made with other capital costs and expenditures, including plant expansion and advertising. Probable effects on prices and profits will be estimated.

Rates of technological change in production processes in the heavy polluting industry categories will be estimated by size of plant and scale of investment and rate of profit and percent of market.

Extent and rate of plant relocation among heavy polluters will be estimated and the increase in plant size and concentration in existing areas will also be determined. These estimates, as well as estimated technological change, will be made in conjunction with the Department of Commerce and industry consultants.

Particularly difficult industrial waste treatment problems will be identified by industrial sector and geographic area and the costs of treatment and possibility of research gains will be estimated.

These data and findings will be analyzed and conclusions and recommendations drawn and a report transmitted to the Congress by January 10, 1968.

Federal Installations

78 pos.

Control of pollution from Federal installations: FY 1967; \$680,000;
FY 1968, ^{78 pos.} \$750,000; Increase, \$70,000. The increase consists of:

- (1) An increase of \$85,000 for positions authorized to be filled in 1967 for a total program of \$750,000.
- (2) A decrease of \$15,000 for nonrecurring equipment costs.

Objective

Executive Order 11288 requires that Federal departments, agencies, and establishments, through prevention, control, and abatement of water pollution from their activities, shall provide leadership in the nationwide effort to improve water quality that is the stated purpose of the Water Pollution Control Act (33 U.S.C. 466). The Order places heavy responsibilities upon the Department for ensuring that its objectives are met and for providing the necessary technical assistance to Federal agencies in developing adequate methods and facilities for treating wastes from their activities that are hazardous to health or substantially harmful to domestic animals, fish, shellfish, or wildlife.

The Order requires positive action of each department, agency, and establishment, and further requires their cooperation with the Secretary of the Interior and with State and interstate agencies and municipalities in preventing and controlling water pollution. Construction and operating plans for waste treatment facilities must take into account water quality standards established under the Water Pollution Control Act.

The Department has direct responsibilities in the following specific areas:

(1) New and existing facilities and buildings: Consult in the development of plans for measures to prevent or abate water pollution; review essential features of proposed control and treatment measures and advise on their adequacy and effectiveness; inspect existing treatment facilities for adequacy.

(2) Federal water resources projects: Review plans for Federal water resources development projects. Within 90 days of submission of each plan, the department is directed to prepare a report of its potential impact on water quality, including any changes considered necessary in the design, construction, and operation of the projects.

(3) Facilities or operations supported by Federal loans, grants or contracts: Provide technical assistance to Federal agencies in the required review of their loan, grant, or contract practices to determine the extent to which water pollution control standards, similar to those set forth in the Order for direct Federal operations, should be adhered to by borrowers, grantees, or contractors.

(4) Pollution from vessel operations: Recommend appropriate water pollution control measures for corrective action and implement the resulting requirements in the operation of Federally-owned vessels.

Program of Work

During 1968, as other departments, agencies, and establishments make increasing use of the assistance provided by the Department, large volumes of work are anticipated in the following major areas:

(1) Advise Federal agencies on water pollution control standards and water pollution control needs, effective plant operation and maintenance, laboratory analyses, and recordkeeping;

(2) Provide information on water pollution control needs in the initial stages of planning for new installations or projects, review and advise on essential features of control and treatment measures proposed for new and existing facilities and projects, and inspect existing treatment facilities for adequacy;

(3) Review plans submitted by other agencies for proposed water resource development projects and report the potential impact of such projects on water quality, including recommended changes where deemed necessary;

(4) Maintain an updated comprehensive study of the problem of water pollution within the United States caused by the operation of vessels, recommend appropriate preventive or corrective action, and implement resulting requirements in the operation of Federally-owned vessels;

(5) Provide technical assistance to other Federal agencies in determining the extent of water pollution control standards to be applicable to those activities in the United States which are supported by Federal loans, grants, or contracts; encourage and assist agencies in prescribing, by regulations, loan, grant, and contract practices designed to reduce water pollution, and review the results accomplished thereunder and recommend appropriate preventive or corrective action;

(6) Organize, coordinate, and conduct periodic inspections of Federal installations;

(7) Advise agencies on the preparation and submission of annual progress reports, coordinate and review such reports, and prepare such other periodic reports as from time to time may be needed;

(8) Establish, as needed, additional guidelines to supplement those parts of the already approved general guidelines which may need clarification; and

(9) Establish a systematic and continuing evaluation of activities and resources to ensure maximum effectiveness in providing assistance to other agencies, enforcement of required standards with respect to Federal activities, and the reduction, to the lowest possible level and at the earliest possible date, of pollution caused by Federal operations and activities.

Accomplishments

During 1966 and 1967, the program reviewed and evaluated plans from sixteen agencies for improvements needed to prevent or abate water pollution from new or existing buildings and facilities under their control. In accord with prior agreements, there was forwarded to the Bureau of the Budget, on September 7, 1966, an evaluation and recommendation for approval of those projects with highest priorities. Valuable assistance and recommendations were furnished during consultations in preliminary and early planning stages of many other projects.

When complete reports have been received for FY 1967, it is estimated that the Department will have reviewed the adequacy of existing waste treatment procedures and facilities at more than 1,100 Federal installations. A considerable proportion of these reviews involved on-site inspection of treatment methods. Related conferences with responsible officials permitted the Department to establish lines of communication with other agencies that will facilitate the cooperation and coordination that is required under both the Executive Order and the Water Pollution Control Act.

Although the review of water resource development projects, which is required under Executive Order 11288, is not a fully developed program, there was considerable coordination between the Department and agencies initiating these projects. Much of this cooperative effort took place during the initial development stages of project planning. Participation was reported in 110 projects.

As required by the Executive Order, the heads of Federal agencies conducted a review of loan, grant, or contract practices to determine the extent water pollution standards, similar to those required for direct Federal operations, could be applied to borrowers, grantees, and contractors. These reports are now being evaluated. While some technical assistance has been provided other agencies, this program is only partially developed and is expected to be a major activity during 1968.

A comprehensive report on water pollution caused by vessels in the United States required under the Executive Order, was completed and submitted. This study, with its recommendations for preventive or corrective action, is expected to provide a basis for meeting the requirement of the Clean Water Restoration Act of 1966 that a report be submitted to the Congress by July 1, 1967.

Guidelines to assist Federal agencies to accomplish their responsibilities under the Executive Order are nearing completion. These guidelines establish uniform procedures that will govern the joint efforts of this Department and other Federal agencies in meeting the requirements of the Order.

Reports and informational materials were supplied the Natural Resources and Power Subcommittee of the Committee on Government Operations.

(b) Research and development

Analysis by Activities

	<u>Pos</u>	<u>FY 1966 Amount Available</u>	<u>Pos</u>	<u>FY 1967 Amount Available</u>	<u>Pos</u>	<u>FY 1968 Estimate</u>	<u>Increase (+) Decrease (-) Over 1967</u>
Program direction.....	33	\$266,283	61	\$564,000	86	\$777,000	+25 +\$213,000
Direct and contractual research.....	414	5,245,721	480	8,543,000	666	16,453,000	+186 +7,910,000
Grants and contracts management.....	51	327,314	55	574,000	70	705,000	+15 +131,000
Unobligated balance lapsing.....		733,738		...		...	...
Total.....	498	6,573,056	596	9,681,000	822	17,935,000	+226 +8,254,000

Research and development

General

The solution for water pollution problems will require the application of existing techniques plus the development of new and improved techniques through research. Research and development activities generally go through a series of steps ranging from exploratory experiments through laboratory research, field evaluation, and demonstration. In the past, efforts have been mainly in laboratory research and there has been a recognized deficiency in the application of research findings. The application of research findings requires that someone undertake the construction and operation of new type facilities which are often very expensive and which is associated with a greater risk of failure than with processes which are already proven in practice. The construction of remedial facilities, in water pollution control, is the responsibility, to a considerable extent, of local authorities who may have limited financial resources. Often these authorities feel that they cannot afford the risk associated with trying new methods. It may very well be in the best public interest for the Federal Government to design, construct, and operate full-scale facilities to develop and demonstrate new ways of pollution control. Such facilities could be built in cooperation with existing or new municipal installations or at Federal installations. Examples of full scale projects which may have to be built to assure an effective water pollution control program are:

- (1) Latest techniques of waste treatment.
- (2) Methods to control nitrates and phosphates and other nutrients which cause fertilization of lakes resulting in objectionable algae growths; also included are procedures for removing these nutrients from lakes and streams.
- (3) Methods for handling, conditioning, treatment and disposal of impurities removed from waste systems.
- (4) Systems for waste water purification and reuse including ground water recharge.
- (5) New processes for industrial waste treatment and control to serve as models to industry and State regulatory authorities on how pollution can be reduced and controlled in an economical manner.
- (6) In-stream treatment methods.
- (7) New instruments for surveillance and operational control.

- (8) Methods for control of pollution from combined and storm sewers.
- (9) A total waste management program in a model river basin including construction of needed facilities.
- (10) Methods for water conservation.
- (11) Control of irrigation return flows and acid mine drainage.
- (12) Methods for joint treatment of municipal and industrial wastes.

The described program of work will require major increases in funding to permit the initiation of such projects by grants on a matching fund basis, and by contracts. It is necessary that the most competent talent is made available in order to carry out research and development programs effectively. As was pointed out in the report "Steps Toward Clean Water" to the Committee on Public Works, United States Senate, January 1966:

"It further appears eminently appropriate and desirable that the competencies and expertise of private industry be enlisted in these important research areas. To this end, the Subcommittee believes the Secretary should make broader use of the contract and grant authorities provided in this Act."

Program direction: FY 1967, ^{41 pos.} \$564,000; FY 1968, ^{86 pos.} \$777,000; Increase ^{+25 pos.} \$213,000. The increase consists of:

- (1) An increase of \$228,000 to strengthen and accelerate planning and direction of all research and development activities for a total program of \$777,000.
- (2) A decrease of \$15,000 for nonrecurring equipment costs.

Need for Increase

Twenty-five positions and \$138,000 are requested for program direction including the Office of the Assistant Commissioner for Research and Development, the Division of Research, and the Division of Engineering Development to effectively plan, direct, maintain the proper balance between, and evaluate the expanded grant, in-house and contract research and development attack on the national problem of water pollution.

Over 650 scientists, engineers and supporting staff are to be located at laboratory and field facilities. Every effort is made to maintain the highest degree of technical and administrative competence. Adequate program direction is required to:

- (1) Assure intra and interprogram development and coordination.
- (2) Make effective use of senior scientific and program competence.
- (3) Interagency coordination of research and development efforts.
- (4) Review of field activities.

An additional \$90,000 is requested for positions authorized to be filled in 1967.

480 pos. *666 pos.*
Direct and contractual research: FY 1967, \$8,543,000; FY 1968, \$16,453,000; Increase, \$7,910,000. The increase consists of:

- (1) *+186 pos.* An increase of \$2,087,000 to accelerate laboratory and field research activities for a total program of \$8,853,000.
- (2) A total of \$7,600,000 for research contractual activity representing total effort proposed for 1968 for this purpose.
- (3) A decrease of \$177,000 for nonrecurring equipment cost.
- (4) A decrease of \$1,600,000 for nonrecurring research contractual activity.

Need for Increase

Laboratory activity

124 positions and \$551,000 are requested to accelerate laboratory research and development effort in three areas: waste treatment technology, water quality requirements and water pollution control technology being conducted at the water pollution control and water quality standards laboratories.

This request will provide for the full complement of research staff in the new laboratories and additional resources for Cincinnati, Ohio. The new facilities are as follows: *65,000*

Athens, Georgia	21	86,000
Ada, Oklahoma	25	72,000
Corvallis, Oregon	20	78,000
College, Alaska	15	106,000
Duluth, Minnesota	31	124,000

All but one of these facilities have already been constructed and are operational. The laboratory at Duluth, Minnesota is now under construction and is expected to be completed before the end of fiscal year 1967.

Field activity

Directly related to the above accelerated laboratory research and development effort is the capability to investigate, evaluate, and experimentally apply treatment and control technology in field pilot plants, evaluation plants, and prototype facilities at such locations as Pomona, California; Lebanon, Ohio; Ely, Minnesota, and the upper Potomac estuary. To carry out these essential field activities dealing with the source and fate of pollutants, the effects of pollution, in-stream or in-lake pollution control techniques, pollution control at the source, and control and treatment of municipal, industrial and agricultural wastes, will require 62 positions and \$803,000 including \$500,000 for mobile pilot plants, sampling equipment, and control application equipment (e.g., chemical feeders, controllers, tanks, mixers, and aerators, necessary instrumentation including versatile mobile laboratories). It is anticipated that these funds will support 10 projects in this area.

SEC 20
PHEMS 7
ADA 7
CORPUS 13
COSTS 6
62
SEC 95,000
PHEMS 35,000
ADA 65,000
CORPUS 63,000
COSTS 14,000
100,000

An additional \$733,000 is requested for positions authorized to be filled in 1967 in these areas.

Contractual activity

The total of \$7,600,000 is proposed to sustain contracts of a research and development nature. These contracts require the application of highly specialized personnel and equipment and facilities having a high value over a short period of time, but of limited value as a long-time, capital investment. The contract mechanism will be used 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 under the grant procedure due to the large degree of risk as to future self-benefits. In addition, there are research and development areas such as eutrophication control, control of rural run-off, boat pollution, etc., (those not eligible for funding under Sec. 6(b)) that will receive support with these funds.

The utilization of contracts in the above areas will greatly facilitate the realization of our program objectives through a supplementation of our already extended in-house research undertaking and will provide the necessary ingredients to deal effectively with the critical time factor. The research and development contracting mechanism enables us to utilize the best professional skills in the entire scientific and engineering community to accomplish our research and development objectives within the time frame imposed upon us.

55 pos. 70 pos.

Grants and contracts management: FY 1967, \$574,000; FY 1968, \$705,000; Increase, \$131,000. The increase consists of:

- +15 pos.
- (1) An increase of \$142,000 to provide for an increased workload in the research and development grant and contracts program for a total program of \$705,000.
 - (2) A decrease of \$11,000 for nonrecurring equipment costs.

Need for Increase

The major research and development activities of FWPCA are carried out through grant and contract mechanisms. The accelerated attack by means of grants and contracts on the national problem of water pollution resulting from the Clean Water Restoration Act of 1966 will require an additional 15 positions and \$62,000 for grants and contracts management and administration. It is essential in this area not only to process, review and award grants and contracts, but also to technically monitor each project and to assess progress and accomplishments. Approximately 50-60 new contracts and 50 new grants will be awarded. The requested increase in positions will be adequate to meet this contemplated rise in the number of grants and contracts. An additional \$80,000 is requested for positions authorized to be filled in 1967.

Research and Development Objectives

While there remains much to be accomplished in defining and characterizing the problems of pollution, it is the prime objective of the program to solve water pollution problems. Priorities must be adjusted so that the more critical problems receive prompt and effective research attention. Many sources of pollution already have been identified including: municipal and industrial wastes including thermal pollution; combined sewer overflows, storm sewer flows, wastes from boats and ships, household or isolated small systems; non-sewered run-off; animal feedlot and drainage wastes; agricultural run-off and irrigation return flows; water pollution resulting from acid mine drainage, mining, petroleum and gas exploitation, construction projects and forest management; quality changes in impoundments; accelerated and natural nutrient additions; rainout and fallout; and natural pollution and salt water intrusion. These sources of pollution take on increasingly menacing proportions when viewed against the unprecedented population and industrial growth and concentration, revolutionary new manufacturing and processing technologies, and changing land uses. A more concerted effort for solving problems must be carried out. More coordination and program control must be executed in dealing with pollution problems without throttling the initiative and creativity of the researchers.

The capability of our scientific and engineering technology, as applied to both existing and emerging pollution problems must be expanded rapidly if the line is to be held in preventing further pollution and if this Nation is to move ahead in pollution control.

At present, in-house research efforts are conducted in temporary facilities at Duluth, Minnesota, and Narragansett, Rhode Island, and at operational regional water pollution control laboratories in Ada, Oklahoma; Athens, Georgia; College, Alaska; Corvallis, Oregon, and at Cincinnati, Ohio. In this fiscal year, a new emphasis will be placed on research and development work at various field sites and pilot plants or facilities outside the laboratories. Each laboratory is being developed as a focal point for a designated research effort. Such centralization of research effort in staffing and specialized facilities promotes more effective utilization of senior research personnel and a higher degree of competence and productivity. Where possible, areas of research requiring similar skills and equipment are grouped in the same laboratory.

Congress has recognized the need for a substantially increased effort and they have authorized and appropriated funds to construct research facilities. It is estimated that to achieve our program objective--the solution of identified pollution problems--an orderly expansion in 1968 and a continuing offensive against emerging and highly complex yet-to-be defined problems must be achieved through an increase in program direction and in-house research staffing.

1968 represents the most significant year in the research and development program for water pollution control. Full recognition has been made of the necessity to accelerate both the research and development aspects and application of new processes, devices, and methodologies to the actual solution of water pollution problems by means of pilot plants, field evaluations, and demonstration plants. The existing plans for the research and development program have called for an engineering evaluation and demonstration approach within the total framework of research and development activities. Legislative restrictions have previously prevented full implementation of this activity. New legislation (the Clean Water Restoration Act of 1966) amending the Water Pollution Control Act removed some of this restriction illustrating Congressional recognition of immediate program implementation. Legislative authority for this key segment of the research and development activity is to be found in Section 5 and Section 6 of Federal Water Pollution Control Act, as amended.

The in-house research activity is authorized within the framework of Section 5 of the Act and is implemented through the programs conducted at the regional water laboratories, the national water quality research laboratories at Duluth and Narragansett, and a number of pilot plant sites around the country.

General contract authority is provided in Section 5 of the Act with private and public agencies. Research grants and research and development grants to public and private agencies are authorized under Section 5 and Section 6. Grants in Section 6 are limited to advanced waste treatment and joint treatment of municipal and industrial wastes, storm and combined sewers, and industrial waste treatment and control. They have limitations with respect to type of grantees, maximum dollar amounts and matching fund provisions.

The research and development effort conducted within the scope of the authorization provided for in Section 5 will provide the framework upon which the program of Section 6 is to be built. The laboratory and pilot-scale preliminary research and development activity prerequisite to the large-scale testing and full-scale field evaluation and demonstration under Section 6 is to be conducted under Section 5. The research carried out under Section 5 will, therefore, complement and be a necessary adjunct to the work conducted under Section 6.

Program of Work

The utilization of research contracts and grants on specific problems to supplement our in-house research effort greatly facilitates accomplishment of program objectives within the critical time factor facing water pollution research and enables us to acquire professional research services not as readily available through direct employment. Specifically, the new legislative authority provides for a cooperative effort of unprecedented magnitude between the Federal water pollution control program in research and development and the efforts of the other public and private agencies of the national research establishment including universities, governmental and other public bodies, industries, and individuals. The program of work for 1968 has been designed to utilize the potential benefits of cooperative research to the fullest extent.

The program of work for 1968 is set forth under the following elements:

- (1) Waste treatment technology,

(2) Water quality requirements, and

(3) Water pollution control technology.

Waste treatment technology

Research will be conducted to improve existing methods and develop new methods for effective removal of pollutants. Through research on the operations and processes of treatment, more economical design and operation of treatment facilities will result.

Research on advanced waste treatment is a special aspect of this overall problem. A major goal of this research effort is to develop and demonstrate practical means for treating waste waters to remove the maximum possible amounts of pollutants to permit repeated reuse of the Nation's waters.

The program is concerned with the development of technology for the separation of a variety of contaminants from water and disposal of these contaminants in ways that will not degrade water quality. The techniques which are showing promise include adsorption, electro-dialysis, coagulation and sedimentation, chemical precipitation, reverse osmosis, and various biological treatment systems for removal of nutrients, etc.

Some of these processes are already approaching the stage where they must be subjected to field evaluation. They must be tested and demonstrated at full scale in actual practice in order to provide the operational and economic data necessary to ensure that the processes may be used with a high degree of reliability and assurance. Cooperative field studies also are under way and more are planned to develop these same treatment techniques for the renovation of waste waters for reuse.

The Committee on Water Resources Research, Federal Council for Science and Technology, has listed the area of waste treatment research as having top priority in terms of water pollution research to meet national needs. The success of the national program in water pollution control depends to a large measure on the success of the advanced waste treatment research program.

The 1968 program goals further provide for an increased effort in the area of treatment of industrial wastes and the necessary research and development to provide for compatible or joint municipal-industrial waste treatment facilities.

The contaminants removed from waste waters cannot be disposed of by discharge into surface streams or underground aquifers since this approach yields no alleviation of water pollution problems. Means for the permanent (nonpollutional) disposal of separated water contaminants, i.e., treatment process sludges, residues and concentrates, must be developed simultaneously and in conjunction with new and improved waste treatment processes.

Four general categories of disposal methods exist: (a) conversion to innocuous form; e.g., incineration, wet oxidation (destruction of organic compounds by exposure to high temperature and pressure), or biological degradation (consumption of concentrated waste materials by bacteria or algae); (b) dumping the concentrates into designated waste reservoirs (e.g., specially constructed and sealed basins, natural waste sinks such as certain desert areas, or even remote areas of the oceans); (c) injection into very deep underground formations or either natural or artificial cavities in the earth; (d) recovery for beneficial reuse. Combinations of these four methods will often provide the optimum solution to a specific disposal problem. One very promising combination approach now under development involves anaerobic digestion (conversion to innocuous form), spreading on disturbed land such as abandoned strip mines (dumping), and use of the material to fertilize, condition, and restore soil values and, in turn, to prevent pollution from silt and acid mine drainage (beneficial use).

Included in this category is the development of the most effective and economical disposal processes to meet a whole range of disposal requirements. The development and improvement of sludge handling, conditioning, and preconcentration techniques are also included.

Water quality requirements

New wastes, particularly synthetic chemicals, are being discharged into waters where they appear as discrete pollutants, either singly or in combination. Many are extremely persistent and stable in water and resist removal by conventional water and waste treatment methods. Some cause obnoxious tastes and odors in drinking water; others are toxic to fish and aquatic life or taint fish flesh; and far too little is known of their toxic effect on humans.

Typical of the studies to be carried out are those designed to determine (a) the effects of pollutants on fish and other aquatic life; (b) effects of treated wastes on quality of streams, lakes, and ground waters; (c) eutrophication, and (d) water quality requirements for such uses as industrial, agricultural, municipal and recreational supplies.

The water quality standards provision of the 1965 amendments to the Federal Water Pollution Control Act adds particular importance to this category of research. Findings of the national water quality laboratories at Duluth and Narragansett will provide the scientific information used in the establishment, review, and improvement of water quality standards. For this reason, advanced staffing has been authorized for the National Marine Water Quality Laboratory at Narragansett, Rhode Island. The staff is housed in leased facilities.

Water pollution control technology

There are two broad categories of waste discharges. One can be collected and conveyed to a central place (municipal sewage, urban storm drainage, and most industrial wastes). The other cannot be collected and conveyed to a central place and, therefore, must be controlled by techniques other than waste treatment. Methods for elimination of wastes at their source or other nontreatment methods for water quality control must be developed for acid mine drainage, natural and oil field brines, pollution from land drainage, etc. The Federal Council for Science and Technology, Committee on Water Resources Research, has identified "Causes and Effects of Water Pollution from Rural Lands" as a priority research item.

In an attempt to apply new technology to the solution of the problem of accelerated eutrophication, two pilot projects have been established.

Large quantities of impurities are discharged into streams and lakes through runoff from street washings and flushing of creek beds during rainstorms and immediately thereafter. Many cities have combined sewer systems which simultaneously carry this storm runoff and both domestic sewage and industrial wastes. Methods must be developed to prevent pollution from storm and combined sewer discharges. Research in hydraulics and feasibility investigations of a variety of proposed engineering solutions are being conducted.

The control of pollution contributions from industrial sources will be investigated in terms of process and plant operation modifications.

Where pollution control by treatment or elimination at the source is not practicable and in the case of drainage from urban and agricultural land surfaces for which control may not be feasible, because of the impracticability of collecting the waste, protection of the

water resource may be accomplished by providing additional dilution water; that is, control is achieved by regulating stream flow with previously impounded water to reduce the concentration of pollutants to tolerable levels. The influence of impoundments on water quality must be determined. Biological transformations of nitrogen, the effects of photosynthesis on the dissolved oxygen resources, the rate of iron and manganese buildup and thermal stratification are included in the factors which must be studied.

Conservation of water in domestic and industrial use can be an important means toward water pollution control and as such, research will begin on development of new techniques and devices for recycle and reuse of water and for reducing volume requirements for industrial and domestic water uses by process, equipment, or appliance changes. These research and development programs must be continued and expanded in order to determine practical solutions and engineering feasibility data for application throughout the Nation.

Basic to a successful research program is the development of methodology for sampling, concentrating, identifying, measuring and monitoring physical, chemical and biological substances present in waters and wastes. Present methodology for sensing the presence and measuring quantities of significant pollutants remains inadequate. By necessity, a program to develop and apply analytical methods to adequately assess water pollution problems, determine the origin of pollutants, predetermine chronic toxic effects and methods for assessing the pollution potential and removability of pollutants must be a continuous effort for a water pollution research program. Chemicals must be measured in concentrations of parts per billion or less. Improved quantitative measurement of viral and bacterial organisms will permit more effective surveillance of water quality to prevent the spread of infectious diseases from pollution sources. Rapid and improved methods for detection and measurement of pollution from human and animal wastes must be developed. Efforts will continue on the development and application of new techniques for the detection and measurement of pesticides, herbicides, and other new synthetic contaminants and for the differentiation of man-made wastes from natural contaminants that occur in streams. Methods are needed to measure the pollutorial characteristics of new wastes where traditional parameters no longer apply--methods which will accurately measure the effects of new pollutants on water quality and suitability for use. Methods are needed also for some of the older wastes and for natural pollutants, the pollutorial effects of which have not been fully assessed.

The sources and fate of pollutants must be determined. There are four major objectives to this aspect of the program.

(1) With the development of the necessary scientific methodology, specific sources and magnitudes of water pollutants must be established; for example, rural runoff and storm and combined sewer discharges.

(2) The pathways of pollutants from source to stream, ground water, lakes, and marine environments must be charted.

(3) The fate of pollutants in fresh and marine water environments, coastal waters, and soils must be established and their persistence and degradability measured.

(4) The mechanics of the dispersal of effluents into surface, ground, and coastal waters and soil must be determined as well as the feasibility of mitigating their polluttional effects by proper and controlled disposal.

In 1968 particular emphasis will be given to pollution from rural runoff and industrial sources. The urban runoff problem will also be investigated as part of our studies under the storm and combined sewer program. We anticipate that our efforts to determine the pathways of pollutants--our second program objective above--will be continued at a constant level. Work on objectives three and four--the fate of pollutants in water and soil and the dispersal of effluents, respectively--will be increased.

Research emphasis on the control of pollution in cold climate environments will be significantly increased in 1968 with the additional staffing proposed for the Alaska Laboratory.

With the greatly increasing demand for water by municipalities, industries, agriculture and in recreational pursuits, it has become mandatory to develop planning techniques and socioeconomic evaluation methods to permit optimum use and reuse of our water resources. For a commodity which is absolutely necessary for the life processes and an essential raw material in almost every industrial manufacturing operation, the existing method of cost allocation and pricing of water must be examined and overhauled, and new ones developed. Existing laws and institutions for regulating the use of water must be reevaluated. The techniques of systems analysis are applicable to the problems of water supply, river basin pollution control, and benefit evaluation, but these techniques must be extended and research performed to develop new methodology to incorporate the vast complexities of the Nation's water resources use characteristics.

In order to ensure the most effective and efficient conduct of our research and development program to achieve optimum water pollution control and to permit optimum water resource management, improved methods must be developed for collecting, evaluating, and processing pertinent water data and information.

Accomplishments

1966

Research programs at laboratories at Ada, Oklahoma; Corvallis, Oregon; Athens, Georgia; College, Alaska; Duluth, Minnesota, and Narragansett, Rhode Island, were initiated.

Waste treatment technology

- (1) Powdered carbon adsorption, electrodialysis, solids removal by coagulation, and precipitation of dissolved nutrients have shown promising results.
- (2) Pilot-scale facilities at Washington, D. C. for nutrient removal and improved suspended solids removal are currently under construction.
- (3) Removal of phosphates through modification of conventional biological treatment plants has been identified as being technically feasible.
- (4) The feasibility of effective and efficient disposal of sludges from treatment processes on strip mines was indicated by laboratory studies.
- (5) The conceptual design of facilities and selection of a site for the full-scale field evaluation of the granular regenerable carbon adsorption waste treatment process were completed.

Water quality requirements

- (1) Test procedures for biodegradability of detergents and verification of biodegradability of new detergents were developed.
- (2) The cause of certain fish kills through a previously unknown mechanism has been discovered.

Water pollution control technology

- (1) Artificial destratification of impoundments has been demonstrated on a pilot-scale basis.
- (2) A chemical method for detecting human and animal wastes was developed.

1967

Waste treatment technology

- (1) Reverse osmosis pilot facilities will be designed and installed (in cooperation with the Office of Saline Water) for treatment of irrigation return flows and acid mine wastes.
- (2) Pilot facility for phosphate removal by modified biological treatment will be constructed and operated.
- (3) Pilot plant investigations of powdered activated carbon adsorption, electrodialysis, ion exchange, and reverse osmosis will be continued.
- (4) Nitrogen removal by soil treatment and by biological nitrification-denitrification will be evaluated.
- (5) Effectiveness of new disinfection methods on waste water organisms will be determined.
- (6) Pilot plant for disposal of biological sludges for recovery, revegetation, and pollution control of strip-mined areas will be installed.
- (7) The design and construction of a variety of pilot-and full-scale advanced waste-treatment facilities for both municipal and industrial wastes has been initiated under the new Research and Development Grants authority.

Water quality requirements

- (1) Additional water quality requirements to help establish standards for fish and aquatic life in fresh and salt water environments will be determined.
- (2) Research to produce improved techniques for measuring pollution effects will be continued.
- (3) Work will continue on development of a generalized short-term bioassay test to aid in establishment of water quality standards for many pollutants.

(4) Environmental test chambers to demonstrate effects of pollution on receiving bodies of water, including ecological changes will be constructed.

Water pollution control technology

(1) Pilot field facility for eutrophication control will be established.

(2) Effectiveness of chemical polyelectrolytes for pollution control in streams will be studied.

(3) Pilot project on artificial reaeration of surface waters as a water quality control technique will be initiated.

(4) Various industrial waste control methods will be explored.

Enforcement

(c) Regulation and enforcement

Analysis by Activities

	<u>FY 1966</u> Amount <u>Pos</u> Available	<u>FY 1967</u> Amount <u>Pos</u> Available	<u>FY 1968</u> Estimate <u>Pos</u>	Increase (+) Decrease (-) Over 1967
Enforcement.....	334 \$3,132,357	358 \$3,799,000	361 \$3,409,000	+3 -\$390,000
Unobligated balance lapsing.....	240,643	...	...	...
Total.....	334 3,373,000	358 3,799,000	361 3,409,000	+3 -390,000

558 pos. 361 pos.

Regulation and enforcement: FY 1967, \$3,799,000; FY 1968, \$3,409,000; Decrease, \$390,000. The decrease consists of:

- +3 pos. +46 pos.
- (1) An increase of \$334,000 for program direction for a total program of \$1,783,000.
 - 43 pos.
 - (2) A net decrease of \$713,000 for major investigatory projects in connection with enforcement actions partially or totally phasing out leaving a total program of \$1,626,000.
 - (3) A decrease of \$11,000 for nonrecurring equipment costs for program direction.

Need for Increase

\$243,000 and 46 positions are requested for direction to enable the program to implement provisions of the Water Quality Act of 1965 and the Clean Water Restoration Act of 1966. The provisions of the 1965 Act provide that water quality standards be established either by State or Federal action. As Federal standards, they are enforceable by Federal enforcement action. If violators of the standards are not abated by State enforcement action, the Secretary may on his own initiative, in the case of violations with interstate effects, or on the request of a Governor in the case of violations with only intrastate effects, request the Attorney General to institute court action. Prior to such request the Secretary must notify the violator(s) and provide a period of at least 180 days for voluntary compliance. In view of the technical aspects involved in these kinds of actions, special staff competence is necessary to initiate, process and fully document these cases. The program must have this capability to meet any and all such requirements. The extent to which these kinds of situations will occur is difficult to predict.

(18 pos. of 46 total)

The 1966 Act transferred the Administration of the Oil Pollution Control Act, 1924, from the Secretary of the Army to the Secretary of the Interior. It also extended the jurisdiction to include all inland navigable waters not heretofore subject to the provisions of this Act. Since this is a new responsibility, the estimate proposes additional resources to enable the Administration to effectively carry out the provisions of this Act.

An additional \$91,000 is requested for positions authorized to be filled in 1967.

Objective

Section 10 of the Act provides for Federal enforcement authority and measures to be applied 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 person, to support and cooperate with State and interstate agencies in the exercise of their enforcement authority to abate and control water pollution; and to enforce the abatement of violations of water quality standards established for interstate waters. Encouragement is provided for cooperative activities by the States relating to prevention and control of water pollution, including enactment of improved State laws and compacts between States.

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

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 forty initiated actions, it has been necessary to advance to the public hearing stage in only four instances, and only a single ultimate court action involving the City of St. Joseph, Missouri. The forty actions to date have been taken in as many separate geographic areas. Forty-one States and the District of Columbia are parties to these actions. The actions involve approximately 1,070 municipalities, 1,260 industries, and will affect some 7,000 miles of rivers, plus large areas of lakes and bays. Remedial facilities built, under construction, or scheduled as a result of agreements reached to date, under these actions, will total about \$10.2 billion.

Water quality standards, established by the States for their interstate waters in accordance with the Water Quality Act of 1965 or otherwise Federally promulgated, are Federally enforceable. Violations are abatable through direct court action, except that a stipulated 180 days are afforded for obtaining voluntary compliance before actual initiation of the court action. It is intended to provide every encouragement to the State authorities to obtain compliance under their own measures in this area of enforcement as well as in pollution abatement.

In addition to the enforcement authority under the Federal Water Pollution Control Act, 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. It also extended jurisdiction to not only include 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 under this Act 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 and the Oil Pollution Control Act will be applied, when applicable, to:

- (1) abate long-standing pollution situations of a serious nature which endanger the health or welfare of any person;
- (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. Compliance with violations of water quality standards and of the Oil Pollution Control Act will be enforced to obtain voluntary compliance, where possible, and through court action wherever required. This will be initial experience in these areas of enforcement.

Accomplishments

In 1966 three new enforcement actions were instituted to abate pollution of interstate or navigable waters and additional conference sessions and meetings of conferees were conducted in continuance of previously initiated enforcement actions.

Initial conference sessions were held in regard to the pollution situations of:

1. Lake Erie (Michigan-Indiana-Ohio-Pennsylvania-New York)

The first session of the conference was held August 3-5, 1965, and the second session was held August 10-11, 1965. Recommendations for remedial action were unanimously adopted by the conferees. A technical committee was also established to evaluate water quality problems in Lake Erie.

2. Red River of the North (Minnesota-North Dakota)

The conference was held September 28-30, 1965, at Fargo, North Dakota, and further meetings among the conferees were held January 18 and March 4, 1966. A program for remedial action was established.

3. Hudson River (New York-New Jersey)

The conference was held September 28-30, 1965, in New York City. The conferees agreed on a program for remedial action and a schedule to put this into effect was established.

Additional sessions of three conferences initiated prior to FY 1966 were reconvened. These conferences concerned the Lower Columbia River, the Calumet Rivers and southern end of Lake Michigan, and the South Platte River.

1. Lower Columbia River (Washington-Oregon)

The first session of this conference was held September 10-11, 1958, and the second session was held September 3-4, 1959. All municipal sewage is now being treated and disinfected, and recommendations for industrial waste treatment have been issued. A third session of the conference was held on September 8-9, 1965. Recommendations for the treatment of industrial wastes and a time schedule were unanimously adopted.

2. Grand Calumet River, Little Calumet River, Wolf Lake, and Lake Michigan (Indiana-Illinois)

The first session of the conference was held March 2-9, 1965. A schedule for remedial action was established and is being put into effect with the advice of the technical committee. A technical session of the conference was held January 4, 1966. The conferees met in Executive Session on January 31 and February 1, 1966, and agreed on water quality criteria and a time schedule for control of industrial waste discharges.

3. South Platte River (Colorado)

The first session of the conference was held October 29, 1963, at Denver, Colorado. A study project was established to investigate sources of pollution. A second session of the conference was held on April 27-28, 1966, where the report of the South Platte River Enforcement Project was presented to the conferees. To allow the newly established Colorado Water Pollution Control Commission sufficient time to evaluate the Federal report and develop a program for implementation of remedial measures and a time schedule, the conferees agreed to the reconvening of the conference at a later date.

In addition, the conferees to the conferences of Lake Erie and the Missouri River, Omaha area, held meetings in 1966. The meeting of the conferees on Lake Erie was held June 22, 1966; and a progress evaluation meeting for the Missouri River, Omaha area, conference was held on March 29, 1966.

In 1967 to date, three new actions have been instituted by the calling of conferences. These conferences concerned the Chattahoochee River (Georgia-Alabama) held July 14-15, 1966; Lake Tahoe (California-Nevada) held July 18-20, 1966; and Moriches Bay and the eastern section of Great South Bay (Long Island, New York) held September 20-21, 1966. The conference on Moriches Bay and the eastern section of Great South Bay was the first to be held under the shellfish provisions of the Federal Water Pollution Control Act, as amended.

At both the conferences on the Chattahoochee River and Lake Tahoe, remedial programs and time schedules were established. At the conference on Moriches Bay and the eastern section of Great South Bay, a coordinating committee was established, on the conferees' recommendation, to develop a comprehensive, detailed program for remedial action, including time schedules, to effect a solution to the total water pollution problem in the conference area. This conference will be reconvened in six months to evaluate the report of the coordinating committee and adopt a uniform plan and time schedule for pollution abatement.

Ten additional conference sessions of on-going actions will be scheduled, including four which have entailed enforcement study projects for which final reports will be completed.

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 problem. The number of these situations cannot be predicted.

Through 1967, major on-site investigations or surveillance activities as a result of enforcement actions are under way in 11 areas. (See table on following page.)

In administering the Oil Pollution Act of 1924, arrangements will be made with the Coast Guard, Army and Customs regarding their role under this Act.

Regulation and Enforcement
(dollars in thousands)
Investigatory Projects Resulting from Enforcement Actions

	<u>Pos</u>	1966 <u>Actual</u>	<u>Pos</u>	1967 <u>Estimate</u>	<u>Pos</u>	1968 <u>Estimate</u>	Increase (+) Decrease (-) <u>Over 1967</u>	
Colorado River.....	52	\$686	52	\$681	49	\$458	- 3	-\$223
Washington State.....	22	259	7	100	7	100	--	....
South Platte.....	18	203	21	176	16	101	-5	-75
Twin Cities/Upper Mississippi.....	34	210	--	38	--	...	--	-38
Merrimack-Nashua.....	12	145	11	146	7	73	-4	-73
Monongahela.....	11	117	10	143	8	82	- 2	-61
Lake Erie.....	3	40	20	150	10	104	-10	-46
Raritan Bay.....	15	208	15	147	15	147	--	....
Detroit River.....	9	79	10	89	10	89	--	....
Mahoning River.....	--	...	3	47	--	...	- 3	-47
Calumet.....	7	71	16	150	--	...	-16	-150
New Studies.....	63	...	59	472	59	472	--	...
Total.....	246	2,018	224	2,339	181	1,626	-43	-713

Construction Grants Administration

(d) Construction grants administration

Analysis by Activities

	<u>FY 1966</u> <u>Amount</u> <u>Available</u>	<u>FY 1967</u> <u>Amount</u> <u>Available</u>	<u>FY 1968</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1967</u>
Program direction	159 \$1,406,372	195 \$1,898,000	195 \$1,884,000	-- -\$14,000
Unobligated balance lapsing	122,628	...	...	-- ...
Total	159 1,529,000	195 1,898,000	195 1,884,000	-- -14,000

195 p.³ 195 p.³
Construction grants administration: FY 1967, \$1,898,000; FY 1968,
\$1,884,000; Decrease, \$14,000. The decrease consists of:

- (1) An increase of \$8,000 for positions authorized to be filled for 1967 and related costs for a total program of \$1,884,000.
- (2) A decrease of \$22,000 for nonrecurring equipment costs.

Objective

The primary responsibilities of this activity are to administer and evaluate the effectiveness of the waste treatment works construction grants program under Section 8 of the Federal Water Pollution Control Act, as amended.

Program of Work

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, inspecting construction, processing 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. Effectiveness of the program is measured through the volume of contract awards, population served, water quality improvement, reduction in backlog and other factors.

One of the provisions of the Clean Water Restoration Act of 1966 was the removal of grant dollar limitations beginning July 1, 1967. It is expected that this will stimulate larger cities to begin construction of needed sewage treatment facilities and will result in larger, more complex projects. While the number of projects which could be supported from the appropriation could be fewer, these projects will actually require more staff time for processing and administration because of their scope and complexity.

The 1966 Amendments also provide for reimbursement for the construction of any treatment works initiated after June 30, 1966, in advance of the availability of funds for a grant. Such projects must be approved by the Secretary and must comply with all the provisions of the Act just as if the project had been approved pursuant to Section 8 and adequate funds had been available to make a grant. These reimbursement projects will increase the work load.

In addition to the administration of grants under the Federal Water Pollution Control Act, this program has the added responsibility of reviewing and certifying all the sewer loans and grants awarded by the Economic Development Administration and the Department of Housing and Urban Development.

The above-mentioned factors, together with the shift of emphasis to larger, more complex projects, will, it is expected, render meaningless the previous experience with unit required time per project administered. The increased grant funds and reimbursement provisions will, at a minimum, require a staff equivalent to that now authorized.

Administration

(e) Administration

Analysis by Activities

	<u>FY 1966</u> <u>Amount</u> <u>Available</u>		<u>FY 1967</u> <u>Amount</u> <u>Available</u>		<u>FY 1968</u> <u>Estimate</u>	<u>Increase (+)</u> <u>Decrease (-)</u> <u>Over 1967</u>
Executive direction and coordination..... ⁴⁰	\$376,179	⁵³	\$722,000	⁶⁸	\$862,000	+15 +\$140,000
Administrative management..... ²⁰⁹	2,354,488	¹⁹⁹	1,975,000	²⁴⁴	2,659,000	+45 +684,000
Regional offices..... ⁶⁶	636,426	¹¹⁴	817,000	¹⁵⁰	1,185,000	+36 +368,000
Public information..... ²³	271,150	³⁰	388,000	³⁶	451,000	+6 +63,000
Civil Service Retirement Fund.....	...		...		350,000	+350,000
Unobligated balance lapsing.....	76,983		...		...	...
Total..... ³³⁸	3,715,226	³⁹⁶	3,902,000	⁴⁹⁸	5,507,000	+102 +1,605,000

490 Aug
2532

500,000
5,000,000
470,000
4,530,000
3532
998
350
628
307
383

Return of

agm
des

Executive Direction and Coordination

Executive direction and coordination: FY 1967, ^{53 pos.} \$722,000; FY 1968, ^{68 pos.} \$862,000; Increase, ^{+15 pos.} \$140,000. The increase consists of:

- (1) An increase of \$170,000 for international and contract compliance and equal opportunity responsibilities.
- (2) A decrease of \$30,000 for nonrecurring equipment costs.

Need for Increase

\$37,000 and 3 positions are proposed to provide for the increasing involvement of the program in the international aspects of water pollution. Water pollution is a matter of growing concern the world over. Other countries have much to learn from the United States in this field, and we have much to learn from them. There is an increasing need for more effective exchange of technical and scientific knowledge so that we and other countries can benefit from advances in water pollution control wherever they occur. The increase proposed for this function, conducted on a very limited scale in the past, would help fulfill an important and growing need.

\$81,000 and 12 positions are proposed for Contract Compliance and Equal Employment Opportunity responsibilities. Heretofore, the majority of the functions comprising these responsibilities were assumed and staffed for by the immediate Office of the Surgeon General of the U. S. Public Health Service. Now the responsibilities are vested in the Federal Water Pollution Control Administration. They originate from Title VI of the Civil Rights Act of 1964 (non-discrimination in the provision of services or benefits under Federally-assisted programs) and Executive Order 11246 (equal employment opportunity - in Federal employment; in employment by contractors of the Federal government; and in contractor employment by recipients of Federal assistance). Both Title VI of the Civil Rights Act and Executive Order 11246 have been implemented by Department of Interior Manual issuances which delegate the principal work responsibilities for carrying out the directives of the Act and Executive Order to constituent Bureaus. In light of these delegations, and of our expanded grant and contract programs, it is proposed to adequately staff headquarters and establish specific staff for this purpose in regional offices.

An additional \$52,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

Executive direction and coordination cover the overall leadership and direction of the Federal Water Pollution Control Administration.

Activities included are the establishment of policies, goals and objectives; the development and issuance of plans, regulations and directives; the distribution of resources; the evaluation of the accomplishments of the Administration in terms of the specified goals and objectives; the performance of special studies and analyses necessary to make reports to the Congress and the development of water quality standards.

This activity includes the Office of the Commissioner, Office of Program Plans and Development, Office of Legislative Liaison and the Water Pollution Control Advisory Board which was established in accordance with Section 9 of the Federal Water Pollution Control Act.

Office of the Commissioner includes the Commissioner, Deputy Commissioner and related staffs, which provides overall direction, supervision and coordination of the Administration's total program.

Office of Program Plans and Development, headed by an Assistant Commissioner, coordinates and evaluates the development and accomplishments of the Administration's plans, programs and budget in terms of goals and objectives; in addition, coordinates the development of water quality standards.

Office of Legislative Liaison coordinates the preparation, review and transmission of legislative material and responds to Congressional inquiries.

Water Pollution Control Advisory Board advises, consults with and makes recommendations to the Secretary of the Interior on matters of policy relating to the activities and functions of the Secretary under the Act. The board is composed of the Secretary or his designee, who shall be chairman, and nine members appointed by the President. Reorganization Plan No. 2 of 1966, transferred the board to the Department of the Interior and added the Secretary of Health, Education, and Welfare as a board member. The nine appointed members must be selected from representatives of various State, interstate and local governmental agencies, of public and private interests concerned with water pollution, and of organizations and groups interested in water pollution prevention and control.

Program of Work

Continue providing overall leadership and direction, establish policies, plans, regulations and directives as needed, coordinate implementation of new legislation passed in calendar year 1966. Increasing emphasis will be placed on the quantification of agency output objectives and cost effectiveness studies. The continued objective will be to make possible more incisive and far-reaching program analyses and reviews than has been the case previously.

Accomplishments

In fiscal years 1966 and 1967, a great deal of time and effort was devoted to problems related to the reorganization of the agency; regional boundaries were established and regional directors appointed; a program review procedure was developed; an information reporting procedure was established; systems planning for laboratory operations was initiated; work was done on interagency groups such as the Water Resources Council and the Interagency Committee on Oceanography; guidelines for water quality standards were established, and extensive assistance was provided to the States, at their request, in the development of the standards.

Administrative Management

199 pos. 246 pos.

Administrative management: FY 1967, \$1,975,000; FY 1968, \$2,659,000;
Increase, \$684,000. The increase consists of:

- + 45 pos.
- (1) An increase of \$307,000 to support the establishment of full fiscal services and strengthen general services to meet increased workload.
 - (2) An increase of \$428,000 for central computer services.
 - (3) A decrease of \$51,000 for nonrecurring equipment costs.

Need for Increase

\$113,000 and 35 positions are requested to enable the Administration to provide fiscal services to programs of the Administration. These fiscal services include accounting, payrolling and voucher examination. In 1967 these services are being provided by the Department of Health, Education, and Welfare. Current plans are to have this responsibility shifted from Department of Health, Education, and Welfare by July 1, 1967. The Administration is formulating plans for this shift. In an endeavor to minimize costs, the plan is to see if these services can be provided through reimbursable arrangements with another agency. Pending such determination, no provision has been made in 1967 to fully staff for this purpose.

In view of the time involved in budget process, in the event the Administration must develop this competency and self-sufficiency, the increase proposed is necessary. It should be pointed out that if the July 1 date is to be met, and the Administration must provide these services itself, staff will have to be recruited, trained, and ready to take on these responsibilities prior to that date. Therefore, to accomplish this, vacant positions and related funds will have to be diverted from other activities, pending approval of the 1968 estimate.

An additional \$32,000 and 10 positions are requested for general services activities. Since the level of employment for the Administration early in 1967 was below that estimated for the previous year and optimum 1967 employment would not be attained before June 30, 1967 proposed staffing of these activities was reduced accordingly. Therefore, the proposed increase for 1968 is necessary to achieve maximum administrative competency and self-sufficiency to provide full support for the program level authorized for 1967, and the increased work load that will be generated as a result of the proposed program increases for 1968.

An additional \$162,000 is requested for positions authorized to be filled in 1967 and related costs.

\$428,000 is requested for data processing costs associated with the use of the Department's IBM computer center. The Administration proposes to utilize this center to meet many of its data processing needs. As a new agency with a rapidly increasing need for program information, a substantial requirement for such service is anticipated.

In the administrative area, activities identified to date needing this kind of service are accounting, budgeting, personnel administration and property accountability.

In the program areas, the increasing interest in water quality problems by other Federal agencies (a total of 28) and the necessity to work with the same basic data, in most instances, indicate the advisability and economic practicality of establishing a central water quality data system. The Division of Pollution Surveillance, FWPCA, currently has an operating databank system (STORET) which, with modifications, can fulfill this need. FWPCA plans to continue the development of this system and operate it as a central storage and retrieval system for nationwide water quality data. Therefore, the request is necessary to finance FWPCA cost for these purposes in utilizing this center in 1968.

Objective

The administrative management support activity's principal objective is to facilitate the attainment of program missions. This is accomplished through close administrative alignment with program components and includes support activity in the field of personnel management, financial management, management systems analysis, facilities management and general services.

Program of Work

In 1968 all activities will be fully self-reliant to provide the necessary services to the Administration's programs, and adequate guidance and coordination of administrative support activities in the field.

Accomplishments

During 1966, activities were directed toward the separation of administrative support activity from the Public Health Service to the Federal Water Pollution Control Administration in the Department of Health, Education, and Welfare. This involved the establishment of an administrative competency in the areas of management support cited above. Reorganization Plan No. 2 of 1966 transferred the Federal Water Pollution Control Administration from the Department of Health, Education, and Welfare to the Department of the Interior. This transfer necessitated a recasting of the administrative support activity to conform to the policies and procedures of the Department of the Interior. During 1967, a gradual pullout from Department of Health, Education, and Welfare support to an independent competency will be accomplished.

Regional Offices

114 pps 150 pps 236 pps
Regional offices: FY 1967, \$817,000; FY 1968, \$1,185,000; Increase, \$368,000. The increase consists of:

- (1) An increase of \$383,000 for strengthening regional offices direction and administrative support.
- (2) A decrease of \$15,000 for nonrecurring equipment costs.

Need for Increase

\$104,000 and 36 positions are requested for administrative support in regional offices. In 1967 staffing was minimal, as in administrative management support, in line with the rate of employment to be achieved by June 30, 1967. Administrative support includes providing services in varying degrees for personnel, fiscal management, and general services. Services are provided to regional office programs and personnel, laboratories, and field projects. The 1968 request provides for increasing this staff to adequately service regional personnel, including program personnel increase for 1968.

An additional \$279,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

Supervise, direct, coordinate, and provide administrative support for all field activities and functions.

The Administration established nine regional offices on a major river basin basis. These are as follows:

<u>Area Served</u>	<u>Location of Regional Office</u>
1. Northeast	Boston, Massachusetts
2. Middle Atlantic	Charlottesville, Virginia
3. Southeast	Atlanta, Georgia
4. Ohio Basin	Cincinnati, Ohio
5. Great Lakes	Chicago, Illinois
6. Missouri Basin	Kansas City, Missouri
7. South Central	Dallas, Texas
8. Southwest	San Francisco, California
9. Northwest	Portland, Oregon

All personnel and functions in the regional offices, laboratories, and field projects are under the supervision and direction of the Regional Director and are provided various levels of administrative support in the areas of personnel, fiscal management, and general services.

Program of Work

In 1968 the regional offices will be fully staffed to provide the necessary direction and supervision, and will be self-sufficient and able to provide programs with appropriate administrative support.

Accomplishments

In 1967 a regional office organization with administrative staffing patterns and delegations of authority has been established. A gradual phase out of service support functions from the Department of Health, Education, and Welfare regional offices is being accomplished as FWPCA capability develops.

Public Information

Public information: FY 1967,^{30 pos.} \$388,000; FY 1968,^{36 pos.} \$451,000; Increase,^{+6 pos.} \$63,000. The increase consists of:

- (1) An increase of \$65,000 for providing information activities in regional offices.
- (2) A decrease of \$2,000 for nonrecurring equipment costs.

Need for Increase

The \$35,000 and 6 positions are to meet the increased work load related to Federal Water Pollution Control Administration's expanding activities, to respond to the public's growing interest in pollution as a national problem and to handle the still greater work load growing out of the new legislation.

Requests by all information media for facts about water pollution and what Federal Water Pollution Control Administration is doing and planning to do are running at an all time high and increasing. Many of these requests require extensive and time-consuming investigation and discussion by Office of Public Information personnel with program officials at all levels, particularly when long-range policy is involved.

The increase will provide for urgently needed information staff in the regional offices. The Regional Information Officer is responsible for organizing, planning, and directing the 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 the FWPCA for the general public, special interest groups, and the information media--press, radio, television, and magazines.

These and related activities are designed to improve and strengthen the total public reporting activities of the Administration by building a more complete public record of what FWPCA is doing and trying to do and providing the kind of information that various organizations and instruments of government want and need in order to cooperate effectively in carrying out the FWPCA programs and objectives.

An additional \$30,000 is requested for positions authorized to be filled in 1967 and related costs.

Objective

The office plans and directs a national program to inform the public of the many ways in which water pollution can be controlled and prevented; works with State, interstate and local public and private agencies and

organizations in the development of more effective public information programs. It is the focal point through which the general public, press, radio, television, magazines, and other media are assisted in obtaining factual information about Federal Water Pollution Control Administration's mission, activities and objectives. It also provides for writing, editing, and clearing of all technical publications.

Program of Work

In 1968, the Office of Public Information will continue to increase the public's awareness of the facts about water pollution, its prevention and control; will produce a wide variety of printed and visual materials; will provide nationwide coverage through regional information offices; and will provide technical writing and editing services to headquarters and the regions.

Accomplishments

Public information is involved to some extent in all FWPCA activities, and these cover a wide range. For example, in 1966, the Administration awarded 900 grants to communities for construction of waste treatment works; 155 research grants, 40 demonstration grants; and 64 training grants; Administration officials made 180 formal presentations before scientific, technical, and general audiences; 150 articles about water pollution were written and published by Administration officers in technical, semi-technical and general magazines; 200 information presentations were made by Administration officers. The public information function is also extensively involved in activities originating outside the FWPCA. News stories throughout the country occurred at the rate of some 5,000 per month; public, congressional and White House inquiries and requests for information materials came in at the rate of about 1,000 a week; stories on water pollution were featured in Life, Saturday Evening Post, New York Times, Wall Street Journal, AP and UPI syndicates, and numerous others; ABC and CBS did documentary programs on the problem as did several local television stations; television industry contributed public service time to television spots.

In 1967, the following major steps will be achieved: Three of our nine regional information offices, which are to provide specific information about conditions and activities in specific parts of the country, will be in operation; a documentary motion picture on water pollution, highlighting the role of the FWPCA in combating water pollution will be produced; new publications telling the story of FWPCA and its role in water pollution control for use in answer to inquiries about our program and in other informational activities will be in print; a new Scientific and Technical Editorial Services Branch, which includes writing, editing, and clearing of all technical publications throughout FWPCA will be in operation; a new and effective reporting service drawing on the resources of the regional offices is in operation; a completely new and more substantive campaign of public information and education will be proposed to the Advertising Council.

Civil Service Retirement Fund

Civil Service Retirement Fund: FY 1967, -0-; FY 1968, \$350,000;
Increase, \$350,000. The total increase is to:

Permit the Administration to fulfill a provision of the 1965 amendments regarding payment to the civil service retirement fund for each Public Health Service commissioned officer converting to civil service status.

Need for Increase

The Water Quality Act of 1965, which established the Federal Water Pollution Control Administration, has a special provision with respect to Public Health Service commissioned officers then 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 Act 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 Act also provided that these funds would be deposited within two years after the date of an officer's transfer.

As of now 151 officers have been converted with the maximum number anticipated to be 160. It is estimated that total cost of meeting the requirements of this provision for these officers will be \$600,000. Since the Act gives two years from date of transfer to make these deposits, we are requesting funds at this time to pay the civil service retirement fund for only the 93 officers that transferred prior to July 1, 1966. The remaining requirements are programmed for fiscal year 1969.

ITEMIZATION OF ESTIMATE

Department of the Interior

Appropriation Title: Water Supply and Water Pollution Control

Federal Water Pollution Control Administration

	Actual 1966	Estimate 1967	Estimate 1968	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total Obligations.....	\$41,273,955	\$91,902,000	\$101,114,000	+9,212,000
Comparative transfer to/from other accounts.....	777,632	-39,179,000	...	+39,179,000
Transfer to:				
"Operating expenses, Public Buildings Service."				
General Service Administration.....	48,470	295,000	...	-295,000
"Salaries and expenses, Office of the Surgeon General," Public Health Service, Department of Health, Education, and Welfare.....	10,000			
"Salaries and expenses, Office of the Solicitor"	...	116,000	...	-116,000
Transferred from "Salaries and expenses, Office of Field Administration," Department of Health, Education, and Welfare.....	...	-55,000	...	✓ 55,000
Unobligated balance available, start of year.....	-820,000	...	...	...
Unobligated balance lapsing.....	3,851,943	2,360,000	...	-2,360,000
Appropriation.....	45,142,000	55,439,000	101,114,000	+45,675,000
<u>Obligations by objects:</u>				
11 Personnel compensation.....	12,549,851	18,540,000	21,478,000	+2,938,000
12 Personnel benefits.....	1,495,062	1,468,000	1,939,000	+471,000
21 Travel and transportation of persons.....	1,233,813	2,203,000	2,441,000	+238,000
22 Transportation of things.....	244,452	374,000	493,000	+119,000
23 Rent, communications, and utilities.....	865,351	1,353,000	2,215,000	+862,000
24 Printing and reproduction.....	310,584	383,000	403,000	+20,000
25.1 Other services	1,372,155	3,119,000	4,764,000	+1,645,000
Research contracts	398,000	4,100,000	10,600,000	+6,500,000
25.2 Services of other agencies	3,215,134	2,600,000	2,600,000	...

Itemization of Estimate--continued

	Actual 1966	Estimate 1967	Estimate 1968	Increase (+) Decrease (-)
Obligations by objects: continued				
26 Supplies and materials.....	916,143	1,286,000	1,327,000	+41,000
31 Equipment.....	1,546,608	1,764,000	1,373,000	-391,000
32 Lands and structures.....	26,878	21,000	21,000	...
41 Grants, subsidies, and contributions.....	17,099,659	54,691,000	51,460,000	-3,231,000
42 Insurance claims and indemnities.....	265	...	...	...
Total obligations.....	41,273,955	91,902,000	101,114,000	+9,212,000

Buildings and Facilities

DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Buildings and Facilities

Appropriation 1967.....		\$4,624,000
Reappropriation, Department of Health, Education, and Welfare Act, 1967...		+1,655,618
Unobligated balance transferred from "Buildings and facilities," Public Health Service.....		<u>+8,433,173</u>
Total available for obligation.....		14,712,791
<u>Decreases (1967)</u>		
Water pollution control and water quality standards laboratories.....	\$9,751,303	
Field evaluations.....	<u>4,929,618</u>	<u>-14,680,921</u>
Subtotal.....		31,870
<u>Increases (1968)</u>		
Water pollution control and water quality standards laboratories.....		<u>+1,920,000</u>
Total available for obligation.....		1,951,870
Less: Unobligated balance from 1967.....		<u>-31,870</u>
Budget estimate 1968.....		1,920,000

Buildings and Facilities

Analysis by Activities

	Amount Available 1967	Unobligated Balance From 1967	Fiscal Year 1968		Total Available 1968 Compared to Total Available 1967	Page Reference
			Budget Estimate	Total Available		
1. Water pollution control and water quality standards laboratories.....	\$9,783,173	\$31,870	\$1,920,000	\$1,951,870	-\$7,831,303	139
2. Field evaluations.....	4,929,618	...	...	...	-4,929,618	143
Total.....	<u>14,712,791</u>	<u>31,870</u>	<u>1,920,000</u>	<u>1,951,870</u>	<u>-12,760,921</u>	

1. Water pollution control and water quality standards laboratories:
FY 1968, \$1,920,000.

The request will provide the following:

a. Equipment..... \$1,000,000

The provision of equipment suitable to the needs of the programs being undertaken at the laboratories is of vital importance. Because of the complexity of some of the research to be performed, it will be necessary to acquire some relatively sophisticated equipment.

Research and investigations of the amount, type, and effect of the nearly infinite variety of synthetic organic chemicals discharged to surface and ground waters, for example, cannot proceed without the complex equipment necessary for accurate and rapid chemical analysis. Similarly, research involving effects of the great number and variety of synthetic organic contaminants in the water environment harmful to aquatic life and detrimental to other water uses cannot be properly evaluated in terms of water quality criteria without appropriate equipment. Measure of the long and chronic effects of pollutants on aquatic life also requires adequate equipment. While initially expensive, this modern analytical equipment is absolutely essential to the mission of these laboratories.

The same situation applies to the other types of research and investigations required for an effective attack on the water pollution problems.

Current estimates of equipment needs were developed for each laboratory on the basis of the proposed research, technical assistance, and training programs. The needs, therefore, are compatible with operational requirements. The following is a distribution of needs by laboratory:

	<u>Equipment Requirements</u>	
	<u>Appropriated</u>	<u>Additional Requirement 1968</u>
College, Alaska	\$155,000	\$98,000
Ada, Oklahoma	295,000	202,000
Corvallis, Oregon	285,000	200,000
Athens, Georgia	210,000	200,000
Ann Arbor, Michigan	150,000	...
Boston, Massachusetts	150,000	...
Narragansett, Rhode Island	250,000	...
Duluth, Minnesota	510,000	300,000
Total	2,005,000	1,000,000

Where the facilities are completed, such as those located at College, Alaska; Ada, Oklahoma; Corvallis, Oregon and Athens, Georgia, provision of equipment is essential in order that the personnel in these facilities can effectively and efficiently conduct their activities. In the case of the Duluth laboratory, now under construction, the requirements are based on the construction schedule and the long lead-time involved in the procurement of some of this equipment.

b. Repairs and improvements..... \$920,000

Installation of special systems, provision of additional storage space, and modifications and improvements are necessary for the facilities completed or to be completed in the near future. These include such items as:

(1) Raw lake water supply system at the Duluth, Minnesota laboratory necessary to the conduct of water quality standards research. Ordinary water service to the laboratory is provided from the City of Duluth municipal system. A source of natural-state water, free from chlorine and treatment additives, is needed for experiments involving aquatic animal and plant life. The estimated cost of this system is \$300,000.

(2) Storage and maintenance facilities for field equipment at Ada, Oklahoma; Corvallis, Oregon; and Duluth, Minnesota at an estimated cost of \$200,000. Such facilities will be of economical construction, with minimum utilities, for unloading, storing, maintaining and repairing boats and other field equipment and vehicles.

(3) Modifications, repairs, and improvements in the main building of the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio will require \$350,000. The transfer of this facility from the Public Health Service to the Federal Water Pollution Control Administration will involve major alterations and modifications to relocate and consolidate technical program activities now located outside the Center building. Funds are included for an electrical survey, roof repairs, and other items to improve maintenance and operation of the building.

(4) Miscellaneous items to improve maintenance and correct operating deficiencies at Athens, Georgia and College, Alaska at an estimated cost of \$70,000. Included are extension of equipment penthouse roof, additional perimeter fencing, cooling tower piping modifications, and a glasswasher at Athens; chilled water system modifications, and steam heating study at College.

500,000
350,000
35,000
35,000
65,000
65,000
20,000

Basis for Construction Program

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

"The Secretary shall establish, equip, and maintain field laboratory and research facilities, including, but not limited to, one to be located in the northeastern area of the United States, one in the Middle Atlantic area, one in the southeastern area, one in the midwestern area, one in the southwestern area, one in the Pacific Northwest, and 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 field 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 assistance 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.

During 1966, four laboratories were completed. These include the 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 provides for the establishment of standards, the research effort in or through these facilities becomes highly important. These facilities are located in Narragansett, Rhode Island and Duluth, Minnesota, respectively.

The construction of the Duluth laboratory was started in early 1966 with completion estimated for July 1967. Construction of the laboratory at Narragansett is anticipated to start in 1967.

The following table reflects the funding status of all these facilities:

WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS LABORATORIES

Cost Estimates Through 1968^{a/}

<u>Location</u>	<u>Planned Personnel Strength</u>	<u>Sq. Ft.</u>	<u>Planning Costs</u>	<u>Construction Costs</u>	<u>Total Cost</u>
<u>Water Pollution Control</u>					
College, Alaska	62	25,000	\$158,000	\$2,436,155	\$2,594,155
Ada, Oklahoma	135	50,000	162,327	2,015,205	2,177,532
Corvallis, Oregon	135	50,000	157,673	2,274,999	2,432,672
Athens, Georgia	135	50,000	181,000	2,569,501	2,750,501
Boston, Massachusetts	135	50,000	160,000	2,350,000	2,510,000
Ann Arbor, Michigan	135	50,000	160,000	2,350,000	2,510,000
Middle Atlantic	...	...	160,000	...	160,000
Columbia, Missouri	...	...	160,000	...	160,000
Vicksburg-Jackson, Mississippi	...	...	160,000	...	160,000
Stevens Point, Wisconsin	...	...	160,000	...	160,000
<u>Water Quality Standards</u>					
Narragansett, Rhode Island	102	35,000	...	1,846,140 ^{b/}	1,846,140
Duluth, Minnesota	133	44,000	...	2,284,000 ^{b/}	2,284,000
Total estimate.....			1,619,000	18,126,000	19,745,000 ^{c/}
Available.....			1,619,000	18,126,000	19,745,000
New obligational authority requested.....			...	...	...

^{a/} Excludes repairs and improvements.

^{b/} Planning and construction costs.

^{c/} Excludes construction costs for four new laboratories previously authorized by Congress.

2. Field evaluations: FY 1968, no funds proposed.

(a) Acid mine drainage demonstration program

This program is jointly carried out with other agencies of the Department. The purpose is to determine the most effective and reasonably priced methods for control of acid mine drainage pollution and to evaluate those methods. This pollution is destroying fisheries and recreational values, creating unsightly esthetic conditions, making water treatment more costly and discouraging new industry in affected areas. The ultimate objective is to obtain information that will permit making adequate and valid legislative recommendations of control measures applicable within entire drainage basins affected by acid mine drainage.

At the present time, the program is actively involved in having measures installed at a site near Elkins, West Virginia; evaluating and planning for demonstration activity at sites near Slippery Rock, Mocanaqua, and Altoona, Pennsylvania. Through 1967, Congress has appropriated \$4,570,000 for installation of control measures. Of this total, \$1,640,382 has been used for the Elkins site with the balance of \$2,929,618 to be used as needed at all the sites involved.

The program includes such things as the installation of masonry seals and lined channels, drilling and grouting of rock strata with various substances, forcing collapse of abandoned mine galleries, application of gaseous and liquid chemicals to immobilize exposed sulfides, reshaping the land surface, compacting soil over subsidence areas and along spoil-banks, building and sealing ponds, applying various mulches and other amendments to the soil, seeding in cover crops for soil stabilization, and planting shrubs and trees.

Planning and evaluation for demonstration activity is well advanced at the Mocanaqua site. Included in the planning for this site are evaluation of a variety of material and techniques for preventing the entry of surface water into abandoned workings and the in-situ (in place) neutralization of acid mine water.

The nature of the program and the absence of this type of experience makes it impossible to estimate the full cost of these demonstration projects. Each site is different in size and characteristics and will require different scopes and types of control measures to be installed. Therefore, until a site is fully investigated and evaluated and plans are formulated, total costs cannot be predicted.

(b) Evaluation of advanced waste treatment processes

An objective of the program is to develop new advanced waste treatment processes. Broadly, the goal is to develop a new arsenal of treatment

tools which will permit the reuse of water through a range of processes. These processes range from recharge of ground waters with treated waste effluents to the complete conversion of waste waters for deliberate recirculation in municipal or industrial water systems.

As new advanced waste treatment processes are developed, they must, of necessity, be operated in the field through construction of field evaluation plants of a size sufficient to allow final development and assessment under full or nearly full-scale conditions. It is only after such field evaluation units are constructed and operated that the necessary costs, performance, and engineering design data become available for subsequent use by the general public.

Through fiscal 1967, \$2,000,000 has been appropriated for this purpose. Although to date none of these funds has been used, it is planned that by the end of fiscal year 1967 several select projects will be undertaken. It is proposed that future requirements for this purpose will be met under the research and development grant and contract program authorized by the Clean Water Restoration Act of 1966.

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Buildings and Facilities

	Actual 1966	Estimate 1967	Estimate 1968	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total obligations	\$4,166,185	\$14,680,921	\$1,951,870	-\$12,729,051
Comparative transfer from other accounts	-4,166,185	...	...	...
Unobligated balance transferred from "Buildings and facilities," Public Health Service .....	...	-8,433,173	...	+8,433,173
Unobligated balance brought forward .....	...	...	-31,870	-31,870
Unobligated balance carried forward .....	...	+31,870	...	-31,870
Appropriation .....	...	4,624,000	1,920,000	-2,704,000
Reappropriation .....	...	1,655,618	...	-1,655,618

Obligations by objects:

22 Transportation of things	3,195	5,000	4,000	-1,000
23 Rent, communications, and utilities	1,815	2,000	2,000	...
24 Printing and reproduction	4,334	...	...	...
25 Other services	232,586	690,000	20,000	-670,000
26 Supplies and materials	10,010	6,000	5,000	-1,000
31 Equipment	124,130	1,975,000	920,000	-1,055,000
32 Lands and structures	3,790,115	12,002,921	1,000,870	-11,002,051
Total obligations	4,166,185	14,680,921	1,951,870	-12,729,051

Construction Grants for Waste Treatment Works

DEPARTMENT OF THE INTERIOR

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

Construction Grants for Waste Treatment Works

Appropriation 1967.....	\$173,000,000
Unobligated balance from prior years.....	+51,202,614
Comparative transfer to "Water supply and water pollution control".....	-39,129,250
Lapsing from prior year appropriations.....	<u>-1,774,877</u>
Total available for obligation.....	183,298,487
<u>Decreases (1967)</u>	
Appalachian regional development.....	<u>-1,443,875</u>
Subtotal.....	181,854,612
<u>Increases (1968)</u>	
Waste treatment works construction.....	<u>+66,143,875</u>
Total available for obligation.....	247,998,487
Less: Unobligated balance from 1967.....	<u>-44,998,487</u>
Budget estimate 1968.....	203,000,000

Construction Grants for Waste Treatment Works

Analysis by Activities

Activity	Amount Available 1967	Fiscal Year 1968			Total Available 1968 Compared to Total Available 1967	Page Reference
		Unobligated Balance From 1967	Budget Estimate	Total Available		
1. Waste treatment works construction.....	\$178,854,612	\$44,998,487	\$200,000,000	\$244,998,487	+\$66,143,875	149
2. Appalachian regional development.....	4,443,875	...	3,000,000	3,000,000	-1,443,875	155
Total.....	<u>183,298,487</u>	<u>44,998,487</u>	<u>203,000,000</u>	<u>247,998,487</u>	<u>+64,700,000</u>	

Construction Grants for Waste Treatment Works

New Obligational Authority by Activity

Activity	1966 Actual	FY 1967 Amount Available	FY 1968 Estimate	Increase (+) over 1967
1. Waste treatment works construction..	\$121,000,000	\$150,000,000	\$200,000,000	+\$50,000,000
2. Appalachian regional development....	...	3,000,000	3,000,000	...
Total new obligatory authority...	121,000,000	153,000,000	203,000,000	+50,000,000

The 1968 estimate of \$203,000,000 is for grants to construct municipal waste treatment works. The estimate includes \$200,000,000 to carry out provisions of the Federal Water Pollution Control Act, as amended, and \$3,000,000 for grants under the Appalachian Regional Development Act.

1. Waste treatment works construction: FY 1967, \$150,000,000; FY 1968, \$200,000,000; Increase, \$50,000,000.

The total estimate is to continue stimulating the construction or upgrading of waste treatment plants to eliminate the discharge of untreated or inadequately treated municipal sewage into the Nation's waterways.

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; keep pace with needs for new facilities resulting from population growth; and keep pace with needs to replace facilities which become obsolescent because of age, technical advancement, or population relocation. The 1966 annual survey of municipal waste treatment needs conducted by the Conference of State Sanitary Engineers reports that 1,285 communities presently discharging raw sewage require new plants for the treatment of waste; an additional 1,694 cities and towns with existing treatment plants require new or enlarged facilities because of obsolescence, or because of insufficient treatment or capacity; and 2,661 unsewered towns require sewer systems as well as sewage treatment plants. While the number of communities discharging inadequately treated sewage increased markedly during the past year, this increase can be attributed to a need for upgrading treatment facilities from primary to the more complete secondary treatment. The estimated total cost of this reported backlog of 5,640 projects, to serve a population of 37 million, is \$2.6 billion for treatment plants, interceptors, outfall sewers, and other ancillary works. However, it has become increasingly clear that this backlog estimate is extremely conservative. Based on a study of the needs of the 100 largest cities, indications are that the minimum backlog is at least twice that reported by the State agencies or approximately \$5.2 billion.

If, in the meantime, we are to bring pollution under control by 1972, an average national expenditure of approximately \$1.9 billion annually is necessary. Of this, \$350 million will be required to replace facilities which become obsolescent and \$270 million will be necessary to provide for population growth. An additional \$1.3 billion annually would be required to overcome the backlog, allowing for the increasing cost of construction in the interim.

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 fiscal year 1967, \$450 million for fiscal year 1968, \$700 million for fiscal year 1969, \$1 billion for fiscal year 1970, and \$1.2 billion for fiscal year 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. These funds are to be apportioned to the States and other jurisdictions according to a formula prescribed in the statute.

The Act further authorized grants of 30% of the estimated reasonable cost of construction of necessary waste treatment works without dollar limitations. The 30% grant limitation may be increased to 40% if the State agrees to pay 30% of the estimated reasonable cost of all projects receiving Federal funds from the same allocation. The 30% limitation may also be increased to 50% 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% of the estimated reasonable cost of all projects receiving Federal funds from the particular allocation. The amount of a grant may be increased 10% 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 grant award can be as high as 55% of the total cost of construction.

The 1966 Amendments also provide 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 requirements of Section 8 but which is constructed without Federal assistance, the allotments for construction grants for any fiscal year ending before July 1, 1971, shall also be available to make payments for reimbursement 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 provided if adequate funds had been available. The same provisions apply for such retroactive grants as apply if the grant is being made for future construction.

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 multimunicipal projects, together with the added incentive of higher grant percentages with certain specified State participation, will stimulate many of these larger cities and metropolitan areas to move ahead with construction. It is anticipated

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

(d)

State or Territory	1966 Allocations	1967 Estimate	1968 Estimate	Increase over 1967
Alabama	\$2,661,760	\$3,012,350	\$3,910,950	\$898,600
Alaska	797,320	811,300	873,500	62,200
Arizona	1,481,520	1,624,000	1,982,200	358,200
Arkansas	2,045,560	2,259,300	2,750,650	491,350
California	7,582,460	9,314,300	13,637,650	4,323,350
Colorado	1,563,970	1,756,200	2,238,650	482,450
Connecticut	1,739,710	2,028,750	2,726,100	697,350
Delaware	804,300	853,250	976,000	122,750
District of Columbia	938,640	1,016,100	1,226,250	210,150
Florida	3,115,180	3,642,200	5,004,250	1,362,050
Georgia	2,829,490	3,256,600	4,341,250	1,084,650
Hawaii	1,075,480	1,145,750	1,319,800	174,050
Idaho	1,310,500	1,373,600	1,557,100	183,500
Illinois	5,110,830	6,233,000	9,006,050	2,773,050
Indiana	2,864,550	3,384,250	4,666,750	1,282,500
Iowa	2,087,700	2,384,700	3,143,200	758,500
Kansas	1,828,500	2,078,900	2,678,150	599,250
Kentucky	2,456,120	2,802,450	3,638,150	835,700
Louisiana	2,562,340	2,913,900	3,809,800	895,900
Maine	1,412,060	1,519,350	1,785,950	266,600
Maryland	2,087,440	2,430,150	3,283,050	852,900
Massachusetts	2,962,920	3,539,550	4,955,750	1,416,200
Michigan	4,241,170	5,077,750	7,229,700	2,151,950
Minnesota	2,359,330	2,743,250	3,682,300	939,050
Mississippi	2,427,490	2,653,850	3,253,000	599,150

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

<u>State or Territory</u>	<u>1966 Allocations</u>	<u>1967 Estimate</u>	<u>1968 Estimate</u>	<u>Increase over 1967</u>
Missouri	2,699,900	3,177,950	4,366,200	1,188,250
Montana	1,201,560	1,272,700	1,458,300	185,600
Nebraska	1,470,770	1,646,400	2,034,600	388,200
Nevada	736,320	777,950	856,400	78,450
New Hampshire	1,123,570	1,212,750	1,379,700	166,950
New Jersey	3,345,980	4,027,600	5,696,400	1,668,800
New Mexico	1,439,760	1,533,900	1,795,500	261,600
New York	8,041,630	9,890,950	14,507,250	4,616,300
North Carolina	3,115,100	3,610,000	4,863,250	1,253,250
North Dakota	1,267,870	1,308,450	1,482,400	173,950
Ohio	5,068,570	6,129,950	8,799,900	2,669,950
Oklahoma	2,025,620	2,277,450	2,917,900	640,450
Oregon	1,577,750	1,776,050	2,262,550	486,500
Pennsylvania	5,790,910	7,035,150	10,148,750	3,113,600
Rhode Island	1,192,190	1,297,800	1,534,200	236,400
South Carolina	2,310,540	2,569,700	3,225,100	655,400
South Dakota	1,302,070	1,393,350	1,580,550	187,200
Tennessee	2,698,070	3,094,100	4,075,300	981,200
Texas	5,165,060	6,222,500	8,857,600	2,635,100
Utah	1,325,250	1,424,000	1,669,000	245,000

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

State or Territory	1966 Allocations	1967 Estimate	1968 Estimate	Increase over 1967
Vermont	1,111,150	1,178,700	1,285,950	107,250
Virginia	2,717,470	3,130,600	4,221,800	1,091,200
Washington	2,042,910	2,345,300	3,130,150	784,850
West Virginia	1,882,500	2,096,150	2,607,900	511,750
Wisconsin	2,572,200	3,009,050	4,096,050	1,087,000
Wyoming	944,630	992,850	1,083,650	90,800
Guam	1,498,370	1,492,450	1,510,900	18,450
Puerto Rico	2,502,930	2,748,150	3,394,450	646,300
Virgin Islands	<u>1,483,010</u>	<u>1,473,250</u>	<u>1,482,100</u>	<u>8,850</u>
Total	130,000,000	150,000,000	200,000,000	50,000,000

2. Appalachian regional development: FY 1967, \$3,000,000; FY 1968, \$3,000,000; No change.

The \$3 million proposed for 1968 is to continue providing additional support for constructing needed sewage treatment plants in the Appalachian region.

Section 212 of the Appalachian Regional Development Act of 1965 authorized \$6 million for grants for the construction of sewage treatment works in the Appalachian region. Grants are made in accordance with the provisions of the Federal Water Pollution Control Act, as amended, without regard to appropriation authorization ceilings or to allotments among the States. The \$6 million initially authorized has been appropriated--\$3 million late in fiscal year 1965 and \$3 million for fiscal year 1967. As of January 1967, awards totalling \$2,186,793 have been approved or were pending approval, with the balance anticipated to be used by June 30, 1967.

Although funds for the initial authorization have been appropriated, legislation now pending before the Congress will extend the Appalachian Regional Development Act and provide for an increase in the authorization. Therefore, the \$3 million proposed for 1968 is contingent on passage of this legislation.

The merits of these grants are evident by the fact that many of the communities receiving aid under this program would have been prevented from proceeding with their projects because of the full utilization of State entitlements under the Federal Water Pollution Control Act. Still, sewage problems are widely manifest in the Appalachian region with over 800 communities having unmet sewage treatment needs. It is estimated that it will cost over \$200 million to construct these needed sewage treatment facilities which are vital to protect health, attract industry, and develop the recreational potential of the Appalachian area.

Allocation by State

	<u>Appropriated</u>	<u>Proposed</u>	<u>Total</u>
Alabama SE	\$643,804	\$321,902	\$965,706
Georgia SE	330,786	165,393	496,179
Kentucky OHIO	190,833	190,833	381,666
Maryland MA	226,626	113,313	339,939
New York NE	392,044	196,022	588,066
North Carolina MA	374,286	187,143	561,429
Ohio OHIO	409,504	204,752	614,256
Pennsylvania MA	1,715,137	762,152	2,477,289
South Carolina MA	314,046	157,023	471,069
Tennessee SE	526,744	263,372	790,116
Virginia MA	315,126	157,563	472,689
West Virginia OHIO	561,064	280,532	841,596
Total	<u>6,000,000</u>	<u>3,000,000</u>	<u>9,000,000</u>

ITEMIZATION OF ESTIMATE

Department of the Interior

Federal Water Pollution Control Administration

Appropriation Title: Construction Grants for Waste Treatment Works

	Actual 1966	Estimate 1967	Estimate 1968	Increase (+) Decrease (-)
<u>Program and Financing</u>				
Total obligations.....	\$119,634,830	\$138,300,000	\$198,000,000	+\$59,700,000
Comparative transfer to "Water supply and water pollution control".....	+870,750	+39,129,250	...	-39,129,250
Unobligated balance lapsing.....	+930,537	+1,774,877	...	-1,774,877
Unobligated balance brought forward.....	-31,638,731	-51,202,614	-44,998,487	+6,204,127
Unobligated balance carried forward.....	+51,202,614	+44,998,487	+49,998,487	+5,000,000
Appropriation.....	141,000,000	173,000,000	203,000,000	+30,000,000
<u>Obligations by objects:</u>				
41 Grants, subsidies, and contributions.....	119,634,830	138,300,000	198,000,000	+59,700,000
Total obligations.....	119,634,830	138,300,000	198,000,000	+59,700,000