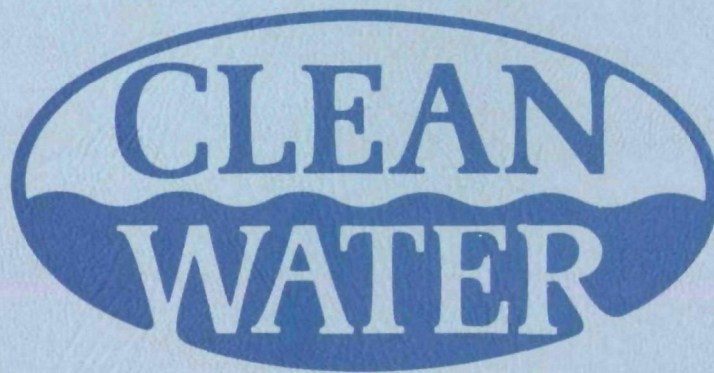


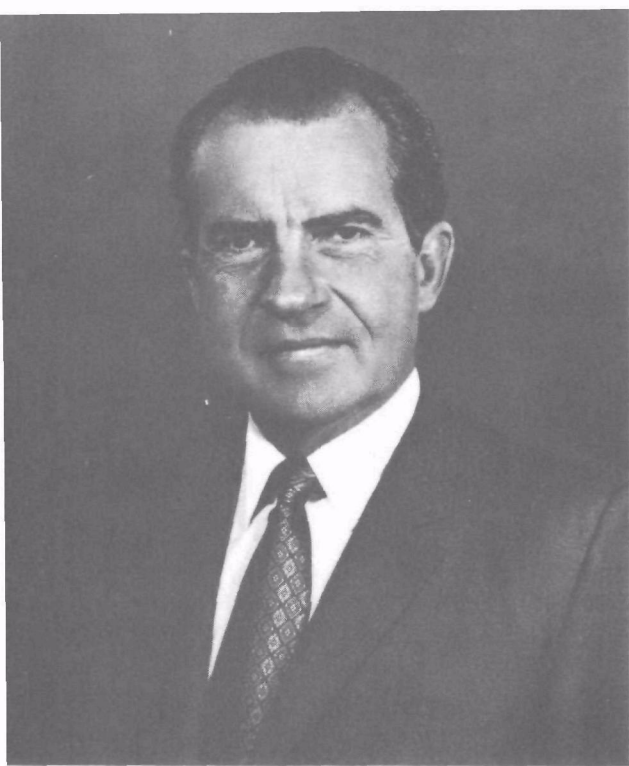
JULY 1971 TO JUNE 1972

**EDUCATION
AND
TRAINING
PROGRAMS**



ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF WATER PROGRAMS



"We have the technology now to deal with most forms of water pollution. We must make sure that it is used."

Richard M. Nixon
From the President's
Message to the Congress
outlining his programs,
February 8, 1971.

"I am going to insist, with the authority I have, and with all the powers of persuasion at my command, that all existing means of controlling pollution be applied, across the board, in every city and town and on every industry in this country—starting right now."

William D. Ruckelshaus
From The Environmental
Crisis—Our Work Has Just
Begun. Presentation to
the National Press Club,
Washington, DC.
January 12, 1971.



JULY 1971 TO JUNE 1972

**EDUCATION
AND
TRAINING
PROGRAMS**

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF WATER PROGRAMS

RELATED ENVIRONMENTAL TRAINING PROGRAMS

ENVIRONMENTAL PROTECTION AGENCY

Director, Training Institute
Environmental Control Administration
Environmental Protection Agency
P. O. Box 30200
Cincinnati, OH 45230

Chief, Radiological Health Training Branch
Training Institute
Office of Training and Manpower Development
Environmental Protection Agency
1901 Chapman Avenue
Rockville, MD 20852

Training Branch
Division of Technical Operations
Solid Wastes Management Office
Environmental Protection Agency
5555 Ridge Avenue
Cincinnati, OH 45213

Director, Office of Manpower Development
Air Pollution Control Office
Environmental Protection Agency
P. O. Box 12055
Research Triangle Park, NC 27709

OTHER FEDERAL TRAINING PROGRAMS

Chief, Training Branch
National Institute of Occupational Safety and Health
1014 Broadway
Cincinnati, OH 45202

Cincinnati Training Facility
Training Institute
Food and Drug Administration
1090 Tusculum
Cincinnati, OH 45226

Director, Training Program
Center for Disease Control
Department of Health, Education and Welfare
Public Health Service
1600 Clifton Road, NE
Atlanta, GA 30333

C O N T E N T S

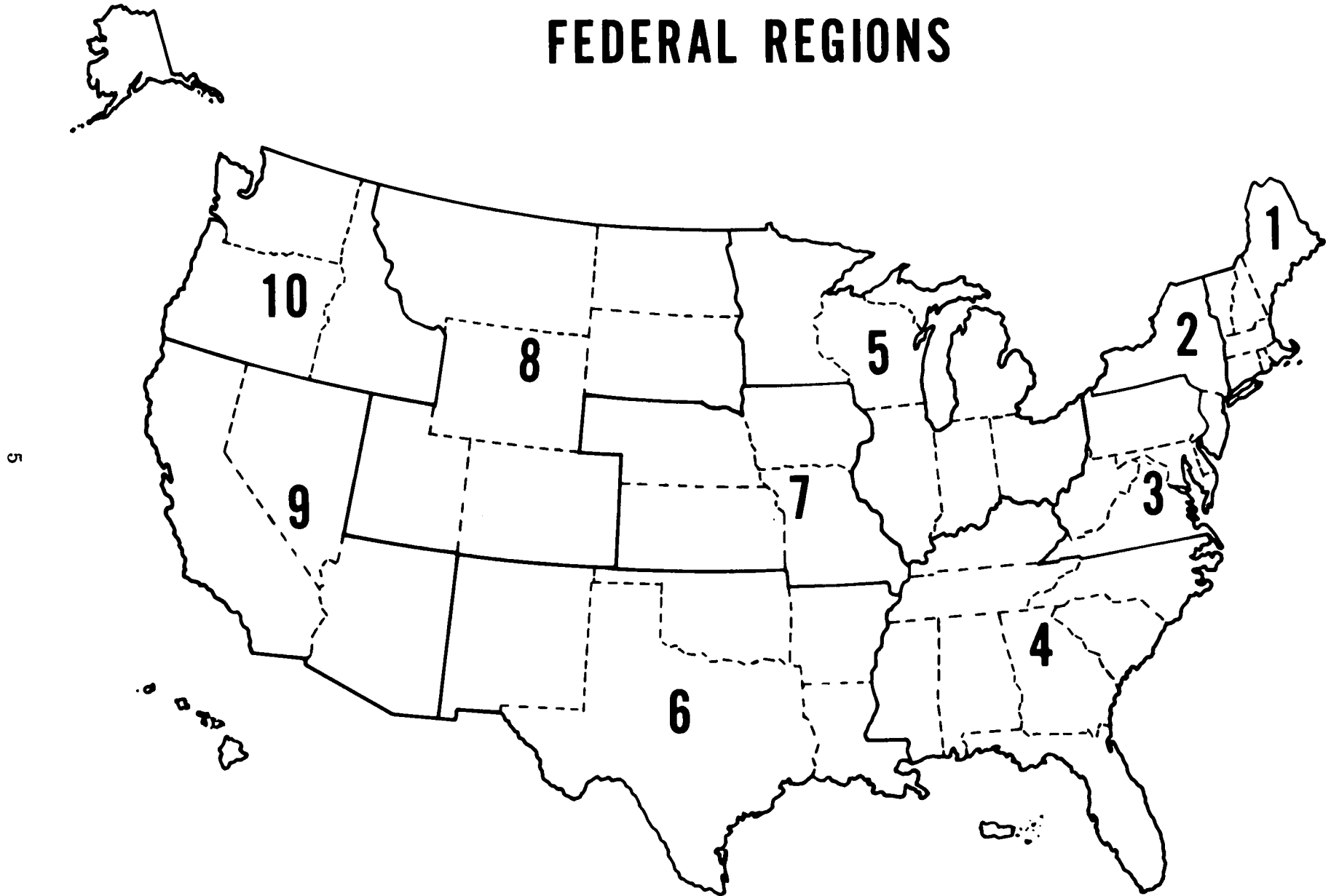
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DIVISION OF MANPOWER AND TRAINING

We are entering a new decade, one in which the American people, and probably all the people of the world, have begun to shift their attention from the heavens above to the earth below. The concern is not so much with outer space, but with what we could do to preserve this good earth on which we live. As this new decade begins it places upon all of us new demands and new challenges, and, incidentally, new opportunities which we never have had before.

In Water Quality Training, we, for the first time, are drawing together all the elements needed to provide America the opportunities to produce the greatest trained personnel in the field of water pollution control. This requires a fully integrated approach, from the remedial education programs, through beginning, immediate, and advance programs of water pollution control. We are on the offensive to enlarge the reservoir of professional and nonprofessional manpower; we are putting more muscle into our total training program. We will exploit all our training resources to meet the new challenges, and new opportunities of this new decade. This Training Division believes in what Mark Twain once wrote: "TRAINING IS EVERYTHING."

FEDERAL REGIONS



ENVIRONMENTAL PROTECTION AGENCY

The facing page shows the administrative program of the Environmental Protection Agency. For further information about details of the training programs described in this Bulletin, please consult with the EPA Regional Coordinator serving the area in which you live.

Names, addresses, and telephone numbers are as follows:

<u>Region</u>	<u>Interim Regional Coordinator</u>	<u>Address</u>	<u>Telephone No.</u>
1	Lester Klashman	Room 2303 John F. Kennedy Federal Building Boston, MA 02203	617 223-7210
2	Gerald M. Hansler	Room 847 26 Federal Plaza New York, NY 10007	212 264-2525
3	Lloyd Gebhard	P.O. Box 12900 Philadelphia, PA 19108	215 597-4506
4	John R. Thoman	Suite 300 1421 Peachtree Street, NE Atlanta, GA 30309	404 526-5727
5	Francis T. Mayo	33 East Congress Parkway Chicago, IL 60605	312 353-5250
6	Bill V. McFarland	1114 Commerce Street Dallas, TX 75202	214 749-2827
7	John M. Rademacher	Room 702 911 Walnut Street Kansas City, MO 64106	816 374-5493
8	Donald P. Dubois	Room 9041 Federal Office Building 19th and Stout Streets Denver, CO 80202	303-837-3283
9	Paul DeFalco, Jr.	760 Market Street San Francisco, CA 94102	415 556-4303
10	James L. Agee	Room 501 Pittock Block 921 S.W. Washington Street Portland, OR 97205	503 226-3914

TRAINING GRANTS

**TRAINING GRANTS
DIVISION OF MANPOWER AND TRAINING
WATER QUALITY OFFICE
ENVIRONMENTAL PROTECTION AGENCY**

GRADUATE TRAINING PROGRAMS

IN

WATER POLLUTION CONTROL AND WATER QUALITY MANAGEMENT

General Information:

As authorized by the Federal Water Pollution Control Act. of 1956, P.L. 84-660, and amendments thereto, the Water Quality Office in the Environmental Protection Agency maintains a grants in aid program to assist public and other institutions and individuals in the establishing, expanding, or improving of training opportunities for individuals interested in careers of research, teaching, administration, and service in the furtherance of water pollution control.

Stipends and allowances are provided for the support of persons engaged in the full-time preparation for a professional degree which will lead to a career in the field of water pollution control or the management of water quality.

The university program director has complete responsibility for the selection of students who are recommended to the Water Quality Office for the award of traineeships, and the allocation of funds pursuant thereto. To receive a stipend from a graduate training grant, the student must meet the following minimum eligibility requirements:

1. Possess at least a Bachelor's Degree.
2. Meet the usual requirements for the graduate school of the grantee institution for admission as an advanced student, and be enrolled or eligible for enrollment as a regular full-time graduate student.
3. Be appointed on a full-time basis.
4. Be a citizen of the United States, or a non-citizen admitted to the United States for permanent residence. A non-citizen holding a temporary visa may be appointed only with prior approval of the awarding unit.

Institutions receiving grants for Graduate Training Programs are given in the list of Grants Awards, published yearly. This listing gives the names and addresses of program directors and a brief description of the program focus, and is available from the Training Grants Branch, Division of Manpower and Training, Water Quality Office, Environmental Protection Agency, Washington, D.C. 20242.

This graduate training program aims to produce professional personnel in four areas for active participation in the control of water pollution:

1. The environmental engineer who is qualified to work in the fields of construction, design, planning or maintenance of water pollution treatment plants.
2. The biologist who is qualified to provide the data needed in the maintenance of approved water quality standards.
3. The chemist and chemical engineer who can improve and devise processes for the more economical treatment of pollutants.
4. The lawyer, economist, and social scientist who will manage and plan the pollution control efforts in being and to be promulgated.

In addition to the production of these personnel, the grants are also for the purpose of improving the staff and facilities at those institutions offering these training programs. Under these grants, every effort is made to have covered all relevant areas of need. These areas include Sanitary, Industrial, Environmental, Irrigation, Chemical, Petrochemical, and Agricultural Engineering, Limnology, Aquatic Ecology, Fisheries and Wildlife Biology, Zoology, and Oceanography, and include parts of other disciplines having particular relevance to the control of Water Pollution.

In addition to the production of the above mentioned types of professional personnel, several short term programs are active in the upgrading and skill-improvement of professionals who have been active in the field, but are in need of training in the latest technical advances in their fields.

Programs are authorized and will be initiated for two other projects within the graduate training. These will have the purpose of (1) providing for the retraining of engineers from fields such as Aerospace and Electronics, who will enter the field of environmental pollution control and (2) providing training at the undergraduate level for personnel who will become versed in the latest design concepts for their inclusion in the modern treatment plants for the control of water pollution. Scholarships are authorized and will be funded at levels commensurate with graduate stipend.

How to Apply:

Application forms for Water Pollution Control Professional Training Grants may be secured from the Chief, Training Grants Branch, Division of Manpower and Training, Water Quality Office, Environmental Protection Agency, Washington, D.C. 20242.

Applications are reviewed the first week of April, August, and December. The applications to be reviewed at these meetings must be complete and on hand in this office at least 30 days prior to the meeting. Notification of the review decision is given approximately two weeks after the review.

RESEARCH TRAINING FELLOWSHIPS

General Information:

As authorized by the Federal Water Pollution Control Act of 1956 P.L. 84-660, as amended, the Water Quality Office in the Environmental Protection Agency maintains a grants-in-aid program to increase the number and competence of trained specialists engaged in research and other activities related to the control of water pollution and the maintenance of water quality and to assure the availability of such specialists to the nation for the preservation of the clean water phase of our environment.

Limited numbers of these Research Training Fellowships are available for advanced graduate level study in the engineering, physical sciences, biological sciences, and socio-economic disciplines, for those scholars qualified and desiring to obtain this specialized training.

Requirements:

An applicant for a Research Training Fellowship must be a citizen of the United States, a non-citizen national of the U.S., or have been lawfully admitted to the U.S. for permanent or temporary residence. An applicant who is not a U.S. Citizen or a non-citizen national must request the Office of the Immigration and Naturalization Service nearest his residence to verify that he was lawfully admitted to the United States for residence. The request to the Immigration and Naturalization Service must be made on that Agency's form N-585, available in any office of that service.

Qualifications:

To qualify for a fellowship the applicant must have a bachelor's degree and have completed 30 hours of graduate study at a recognized institution, and must be accepted for admission by an acceptable educational institution.

Post-doctoral and Special applicants must have a doctoral degree from a recognized institution or show an equivalent experience necessary to complete the advanced training requested.

In awarding the fellowship consideration will be given to the degree of water pollution control orientation, to the adequacy, value, and compatability of the program to be followed, the research orientation, and the qualifications, interest, and potential contribution to the water pollution control field of the applicant.

Terms of Support:

Fellowships are awarded on a 12-month basis. The fellow is expected to pursue a full-time training program. If support is desired for more than one year, justification of the additional training should be furnished at the time the initial application is made. Support for additional training will, in all cases, depend upon a satisfactory progress report from the sponsor and the availability of funds appropriated by the Congress for this program.

How to Apply:

Application forms for Water Pollution Control Research Training Fellowships may be secured from the Chief, Training Grants Branch, Division of Manpower and Training, Water Quality Office, Environmental Protection Agency, Washington, D.C. 20242.

Applications are reviewed the first week of April, August, and December. The applications to be reviewed at these meetings must be complete and on hand in this office at least 30 days prior to the meeting. Notification of the review decision is given approximately two weeks after the review.

UNDERGRADUATE TRAINING GRANTS

The "Water Quality Improvement Act of 1970" provides for undergraduate training grants to institutions of higher education which will provide training to individuals planning to enter an occupation which involves the design, operation and maintenance of waste water treatment works.

Training Grants will be awarded to two year past high school institutions for demonstration programs in the operation, maintenance and management of treatment plants. Similar institutions interested in the model programs will be provided with objectives and relevant information.

Demonstration programs at the baccalaureate level to train individuals in the design of treatment works will be funded. An opportunity to gain information regarding the model program will be made available.

Scholarships for undergraduate study are authorized under the law and will be provided by the grantee institutions according to available funds. Guidelines for making applications will be available to those requesting it.

TECHNICAL TRAINING GRANTS

Grants to fulfill specialized needs are funded under the technical training grants program. Examples of technical grants follow:

CURRICULUM ACTIVITIES GUIDE TO WATER POLLUTION AND ENVIRONMENTAL STUDIES

A curriculum guide and a teacher training system for use by secondary schools was developed at Tilton School, Tilton, New Hampshire. The involvement of students and teachers in activities directed at solving environmental problems is the focus of the program.

PROGRAMMED INSTRUCTIONS IN WATER POLLUTION CONTROL

A series of programmed learning materials was developed at the University of Michigan. The materials deal with chemistry of analysis and treatment of natural and waste waters.

CORRESPONDENCE COURSE FOR TREATMENT PLANT OPERATORS

A self-study training program for waste water treatment plant operators was developed by Sacramento State College. Operators unable to attend formal training courses will find the course useful.

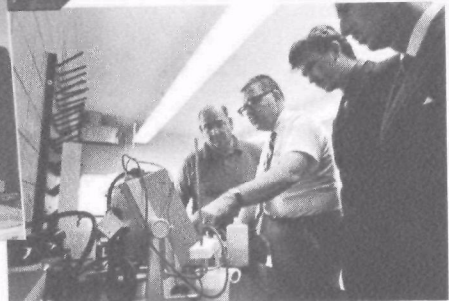
For further information write:

ENVIRONMENTAL PROTECTION AGENCY
Water Quality Office
Training Grants Branch
Washington, D. C. 20242
(Phone 703-557-7620)

STATE AND LOCAL OPERATOR TRAINING PROGRAMS

STATE AND LOCAL OPERATOR TRAINING
DIVISION OF MANPOWER AND TRAINING

WATER QUALITY OFFICE
ENVIRONMENTAL PROTECTION AGENCY



STATE AND LOCAL OPERATOR TRAINING PROGRAMS

To meet the critical shortage of trained operators in wastewater treatment plants at the State and local level, the Water Quality Office has launched four new programs in cooperation with the Department of Labor, Health, Education and Welfare, and Defense.

1. *The Coupled Classroom On-The-Job Training Program* is currently training approximately 1,000 operators. Seventy per cent of those enrolled are receiving instruction and training to improve their skills, and thirty per cent are new entries in the wastewater treatment field.

Duration of training varies from 22 to 44 weeks, depending upon local conditions and needs, but all trainees receive essentially the same number of hours of instruction and training. The curriculum includes basic and remedial education in math, science and communications; plant operation; laboratory techniques; maintenance practices.

This is the second year of the program. During 1969-70, the Federal Water Quality Administration initiated and administered a pilot program in cooperation with the Departments of Labor and Health, Education, and Welfare. A total of 1,055 operators in 20 states entered the training program, and 924 successfully completed the course.

The results of the 1969-70 pilot program were encouraging: promotions, certification and higher salaries were obtained by almost all trainees; many trainees gained high school equivalency diplomas; noticeably improved motivation of trainees was achieved; the training was well received and at times praised by State and local officials and by plant supervisors. Moreover, typical advantages to operators who successfully completed the training program: the State of Washington granted one year of college equivalency, the Metropolitan Sanitary District of Greater Chicago granted four years experience credit, and the States of California and Iowa allowed the equivalent of one year's experience towards a higher level of certification.

As in 1969-70, the current program is administered by the Water Quality Office by means of subcontracts with States, municipalities, councils of governments, colleges and universities, and special wastewater districts.

Under the 1970-71 program, coupled OJT operator training projects are being carried out by the following subcontractors:

STATE	LOCAL SPONSOR & ADDRESS	CONTACT & PHONE NO.
*Arizona	Arizona State Health Dept. Hayden Plaza 4019 N. 33rd Drive Phoenix, AZ 85017	Joseph Orb 602/271-5455
Arkansas	NW Arkansas Regional Planning Comm. 505½ West Huntsville P. O. Box 402 Springdale, AR 72764	Kenneth Riley 501/751-7126
California	State Water Resources Control Board 1416 Ninth Street, Rm. 1140 Sacramento, CA 95814	Robert Daigh 916/445-9624
*Connecticut	State of Conn. Dept. of Labor Employment Security Division 200 Hollybrook Blvd. Weathersfield, CT 06109	Thomas Yoczick 203/566-4850
Florida	State of Florida Division of Health Jacksonville, FL 32201	S. A. Berkowitz Hardy Croom 904/354-3961
Illinois	Metropolitan Sanitation District of Greater Chicago 100 E. Erie Street Chicago, IL 60611	Tentative
	Southern Illinois Univ. Edwardsville CAMPS Edwardsville, IL 62025	Clifford Fore 618/692-2000
*Illinois	Waubomsee Comm. College Sugar Grove, IL 60554	Tentative
*Indiana	Mallory Tech. Institute 1315 East Washington St. Marion County Indianapolis, IN 46202	John Miller 317/447-5061
	Tippewa Regional Institute Indiana Voc. Tech. College 2316 South Street Lafayette, IN 47904	William Roark 317/632-8421
	NW Technical Institute Indiana Voc. Tech. College 1440 E. 35th Street Gary, IN 46409	Ola Thorne 219/887-9646
	St. Joseph Valley Regional Inst. 1534 W. Sample St. South Bend, IN 46619	Dorothy Bupp 216/289-7001

STATE	LOCAL SPONSOR & ADDRESS	CONTACT & PHONE NO.
Kentucky	The Univ. of Kentucky Research Foundation Univ. of Kentucky Lexington, KY 40506	Terry Regan 606/258-4666
Louisiana	Louisiana State Dept. of Health 325 Loyola Ave. State Office Bldg. P. O. Box 60630 New Orleans, LA 70160	Gerald Healy, Jr. 504/527-5114
Maryland	Charles County Comm. College P. O. Box 910 Charles County La Plata, MD 20646	Carl Schwing 301/934-2251
*Mississippi	Miss. Air & Water Poll. Control Comm. P. O. Box 827 Jackson, MS 39205	Glenn Wood 601/354-6783
Missouri	Metropolitan Planning Comm. Kansas City Region 127 West 10th Street, Suite 366 Kansas City, MO 64105	Thomas Neal 913/474-4240
*Michigan	Washtenaw Community Coll. P. O. Box 345 Ann Arbor, MI 48107	Paul Niehaus 313/483-5152
*Minnesota	Metropolitan Sewer Board St. Paul, MN 55071	Lowell Marsh
Nebraska	City of Omaha Interim City Hall 18th & Dodge Streets Omaha, NB 68102	Charles Geisler 402/733-5465
*New York	Dept. of Public Works Division of Water Poll. Control P. O. Box 400 Oriskany, NY 13424	Albert Schuler 315/736-3790
*New York	County Sewer District No. 1 18 New Hempstead Road New York, NY 10956	E. Kendrick 914/634-3629
	*Bureau of Water Resources Environmental Protection Admin. 40 Worth Street New York, NY 10013	Charles Samowitz 212/566-4200
North Carolina	NC Dept of Water & Air Resources P. O. Box 27048 Raleigh, NC 27611	W. E. Long 919/829-3006

STATE	LOCAL SPONSOR & ADDRESS	CONTACT & PHONE NO.
North Dakota	ND State Dept. of Health Division of Water Supply and Pollution Control State Capitol Bldg. Bismarck, ND 58501	Henry Flohr 701/224-2371
*New Mexico	State Dept. of Health State Office Bldg. Santa Fe, NM 87501	Michael Feld
Oregon	City of Portland Dept. of Public Works 1220 SW 5th Avenue Portland, OR 97224	Howard Harris James Burns 503/228-6141
Ohio	City of Cleveland 1825 Lakeside Cleveland, OH 44114	Clyde Kirsch 216/694-2765
South Carolina	SC Pollution Control Authority P. O. Box 11628 Columbia, SC 29211	Charles Hollis 803/758-2915
Texas	North Central Texas Council of Governments P. O. Box 5888 Arlington, TX 76011	James Goff 817/261-3331
Utah	Utah Division of Social Services Division of Health 44 Medical Drive Salt Lake City, UT 84113	C. K. Sudweeks 801/328-6111
*Washington, D.C.	District of Columbia Government Dept. of Water Services, Rm. 307, Presidential Bldg. Washington, D. C. 20004	Jean Levesgue 202/628-6000
*West Virginia	West Virginia Board of Regents West Virginia Univ. Morgantown, WV 26505	Jerry Burchinal 304/293-3580

*Tentative Locations

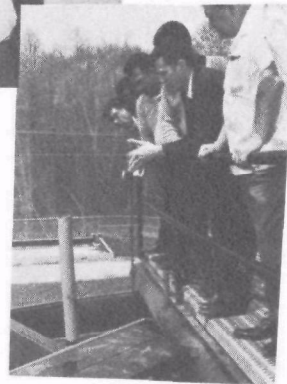
2. *Regional Institutional Training Programs* will be conducted at community colleges or vocational schools in New York, Maryland, Georgia, Ohio, California, Missouri, Iowa, Texas, and Idaho.

Each institution will enroll 40 trainees in cooperation with publicly-owned waste treatment plants for a total enrollment of 360 persons. Twenty trainees will receive instruction during the first 22 weeks, with an additional 20 enrollees receiving instruction during a second 22-week period.

Each individual will receive 440 hours of formal classroom instruction and 440 hours of hands-on instruction in a water pollution control plant. Subsistence allowances will be paid to the trainees in the program by the U. S. Department of Labor.

This type of training will be given at the following institutions:

Institution	Project Director
1. Charles County Community College LaPlata, Maryland	Carl Schwing
2. Kirkwood Community College Cedar Rapids, Iowa	Daryle C. Holbrook S. Ballantyne
3. Atlanta Area Technical School Atlanta, Georgia	J. Reynolds
4. Delaware State College Dover, Delaware	Dr. Seidel
5. Metropolitan Junior College District Kansas City, Missouri	Dr. Donald Welsh
6. Columbus Technical Institute Columbus, Ohio	Clinton, Latch
7. (Tentative) Pocatello, Idaho	
8. (Tentative) California	
9. (Tentative) Texas	



3. *The Transition Training Program* is aimed at servicemen who are returning to civilian life. Five military installations and five schools jointly offer courses in waste treatment plant operations to 310 men. Funds are being provided to pay for instructors, supplies, equipment, administration, and job location assistance.

Army trainees are given 240 hours of instruction, and Marine Corps enrollees receive 640 hours of training. Arrangements have been made with the Veterans Administration to approve further on-the-job training for servicemen completing the program.

Sewage treatment plants near the military bases are used during the courses. Servicemen in their last six months of duty are eligible for the instruction. Many of those completing wish to return to their home communities to seek employment.

The military installations and cooperating schools are the following:

Military Base	School	Project Director
1. Ft. Belvoir Virginia	Charles County Community College, LaPlata, Maryland	Carl Schwing
2. Ft. Bragg North Carolina	Fayetteville Technical Inst. Fayetteville, North Carolina	T. Kobella
3. Ft. Bliss Texas	El Paso Independent School District, El Paso, Texas	C. Michel
4. Ft. Hood Texas	Central Texas College Killeen, Texas	E. Kasprzyk
5. El Toro Marine Base, California	Orange Coast Community College, Costa Mesa, California	J. Owens



Transition Training

4. *The Public Service Careers Program* is training 400 newly employed persons and upgrading the skills of 500 presently employed persons in the water pollution control field (including clerical and other support personnel). Agencies participating with the Water Quality Office in the program are:

Sponsoring Agency	Project Director
1. State Planning & Grants Division Office of the Governor 915 Main Street Columbia, South Carolina 29210	Mr. Stanley I. Hudnall
2. North Central Texas Council of Governments P. O. Box 5888 Arlington, Texas 76011	Mr. James D. Goff, P.E.
3. Texas Water Quality Board 1108 Lavaca Street Austin, Texas 78701	Mr. Boyd B. Rhea, Jr.
4. Manpower Services Coordinator Pollution Abatement Division P.O. Box 11143 Richmond, Virginia 23230	Mr. C. E. Easlick
5. Wisconsin Board of Vocational, Technical & Adult Education 137 East Wilson Madison, Wisconsin 53703	Mr. Clifford Zenor
6. Governor's Office St. Thomas Virgin Islands 00801	Mr. Ashley Richards

Details about any of the above programs can be obtained by contacting the Director of Training at the various local sites indicated, or by writing to the Division of Manpower and Training, Water Quality Office, Environmental Protection Agency, Washington, D.C. 20242

DIRECT TRAINING

The Direct Training Branch, Division of Manpower and Training, conducts a program of scheduled training courses and training support in water pollution control.

Training is offered at five locations in the United States. These are: The National Training Center at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio; the Robert S. Kerr Water Research Center in Ada, Oklahoma; the Southeast Water Laboratory in Athens, Georgia; the Pacific Northwest Water Laboratory in Corvallis, Oregon; and the Edison Water Quality Laboratory in Edison, New Jersey. Subject to priorities of existing schedules and resources available, a limited number of training courses can be presented in field locations other than training facilities listed here. Such training is offered through special agreements, with approval of the EPA Regional Coordinator of the Region in which the course is given.

The objective of the Direct Training Branch is to provide specialized training in the causes, prevention, and control of water pollution. The following principles are applied in establishing the type and priority of training offered:

Training is offered which is not generally or readily available elsewhere in specialized subjects; this includes current philosophies and practices, and recent developments in sanitary engineering, chemistry, aquatic biology, and microbiology in the field and in the laboratory.

Training is offered in the planning, development, and management of wastewater treatment facilities.

Training is offered which leads to improvements in the operation and maintenance of wastewater treatment facilities.

Training is offered which supplements and supports, but does not supplant, State and local programs of operator training.

Training is offered to individuals who are in a position to transmit the gained knowledge to others within their sphere of influence.

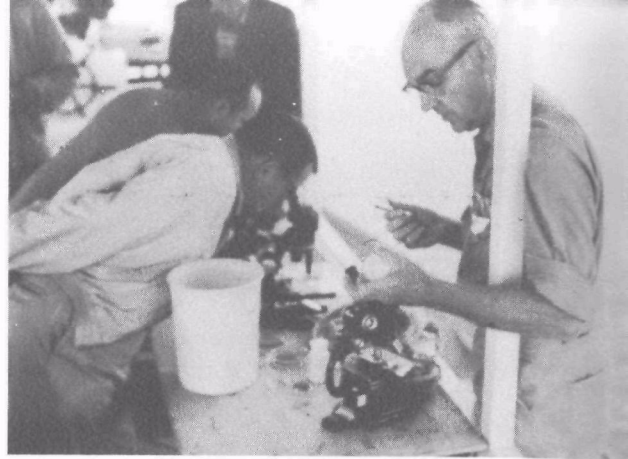
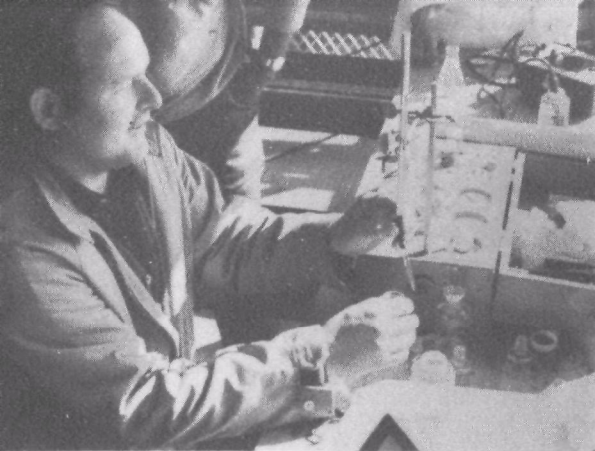
Training is offered to improve the proficiencies of individuals engaged in the planning, preparation, and conduct of instruction of personnel having operational responsibilities in water pollution control.

Support of training programs for wastewater treatment plant operators, as well as technical and professional personnel, is available through technical consultations on the planning and development of training courses. Guest appearances of instructors can be arranged. Instructional materials such as training manuals, course plans, and audiovisual training aids can be made available, subject to priorities of existing training schedules, or may be reproduced freely.

Courses and schedules for the period July 1971—June 1972, are presented in the following pages.

**DIRECT TRAINING
DIVISION OF MANPOWER AND TRAINING**

**WATER QUALITY OFFICE
ENVIRONMENTAL PROTECTION AGENCY**



COURSE DESCRIPTIONS



CHEMICAL ANALYSES FOR WATER QUALITY (100)

2 weeks

CINCINNATI, OHIO August 16-27, 1971

Feb. 28—March 10, 1972

CORVALLIS, OREGON Jan. 31—Feb. 11, 1972

This course is designed for those persons who either perform chemical analyses for water quality or interpret chemical data, and who have an understanding of basic chemistry and chemistry laboratory procedures.

Learning objectives for the student are:

To understand selected tests employed in chemical analysis

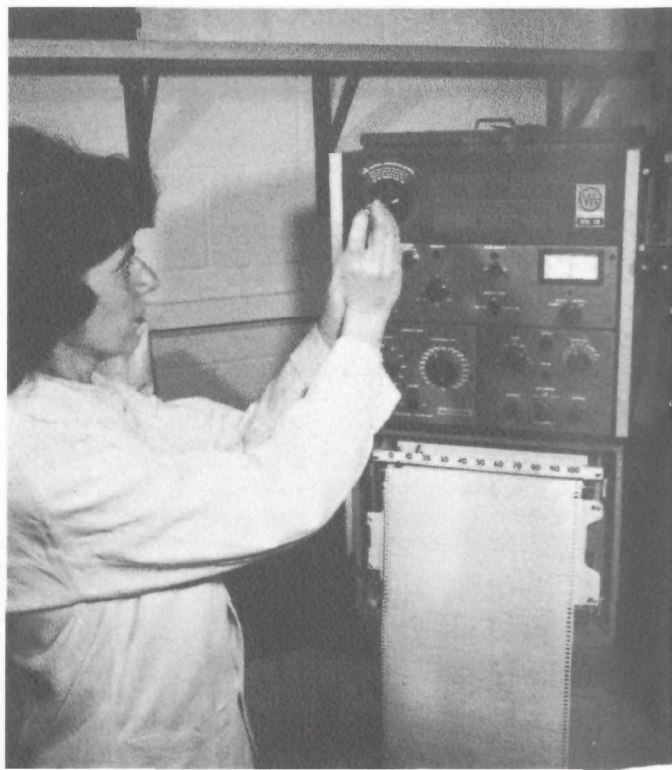
To know the advantages and limitations of specific test methods or instrumentation

To select the more effective analytical methods

To perform selected wet chemical and instrumental methods, and

To evaluate results in terms of statistical inferences

Selected analytical procedures are presented in lecture-discussion sessions in the classroom outlining essentials of the tests, control techniques and interpretations. Various methods are stressed to increase specificity and validity of chemical criteria related to water pollution control, and compliance with water quality standards. About half of the course time is devoted to practice in laboratory operations. The students utilize wet chemical procedures and instrumentation for visible, infrared, flame and atomic absorption spectroscopy, dissolved oxygen, pH and conductivity meters. Calculations of results are performed in homework or workshop sessions and the results compared statistically in class discussions.



**PESTICIDE RESIDUE ANALYSIS
IN WATER (103.1)**

(Gas Chromatographic Systems and Techniques)

1 week

ATHENS, GEORGIA November 8–12, 1971

This course is primarily designed for professionals and technicians who are involved in the analysis of pesticide residue in water. The course includes an introduction to residue analysis and progresses into advanced use of the gas chromatograph.

After completing the course the student will be able to use extraction and cleanup procedures for the analysis of a water sample for pesticide content. He will be able to use a gas chromatograph for pesticide residue content in a water sample. He will be able to measure the cholinesterase inhibition in fish by applying colorimetric analysis.

The analytical procedures taught in the course will conform to those now being used by the Water Quality Office in its investigations.

Subject matter to be covered includes:

- Extraction methods
- Sample preparation
- Sample analysis
- Methods for detection of cholinesterase inhibition
- Gas chromatography systems and function
 - Flow system
 - Temperature control
 - Electrometer
 - Detectors
 - Recorders
- Column technology
- Trouble shooting
- Quantitation

Laboratory practice will be emphasized, utilizing gas chromatographic systems.

**PESTICIDE RESIDUE ANALYSIS
IN WATER (103.2)**

**(Infrared Spectroscopy and Thin Layer
Chromatography)**

1 week

ATHENS, GEORGIA December 6–10, 1971

This course is designed for analytical chemists or for technicians with suitable training or experience who are involved in the analysis of pesticide residue in water.

Upon completion of the course the participant will understand the basic principles of infrared spectroscopy for the interpretation of major functional groups applicable to pesticide residues. He will be able to apply basic procedures for the preparation of thin layer plates and the use of these as a cleanup procedure for pesticide residues prior to their identification by infrared spectroscopy.

The methods of instruction will include lectures, discussions and laboratory work on the following subjects.

- Principles and theory of infrared spectroscopy
- Basic instrumentation and accessories
- Interpretation of major functional groups
- Practical applications such as sampling techniques used in pesticide residue analysis
- Maintenance and trouble shooting of infrared equipment
- Principles of chromatography
- Preparation of thin-layer plates
- Spotting, developing and evaluating thin-layer chromatograms used for pesticide residue analysis.

**LABORATORY ANALYSES IN
TREATMENT PLANT OPERATIONS (105.1)**

1 week

EDISON, NEW JERSEY January 17–21, 1972

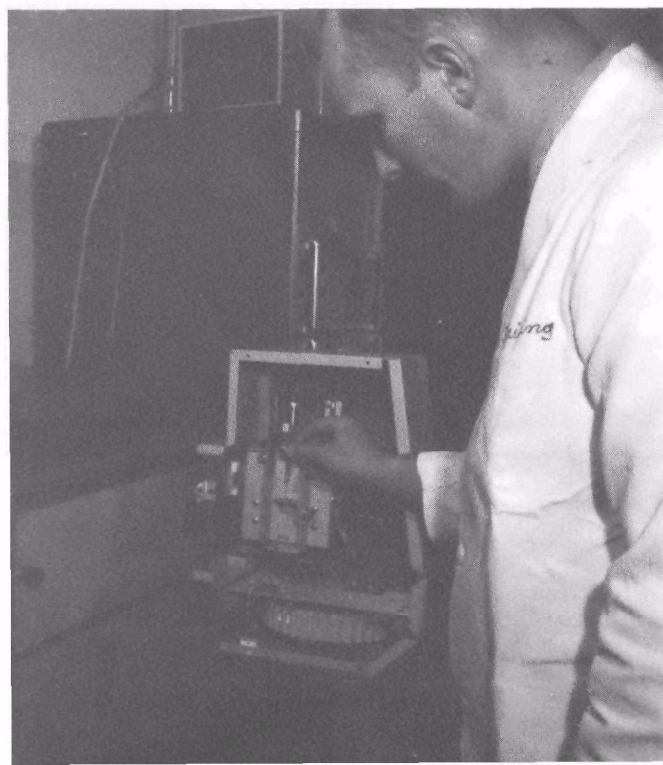
This course is intended primarily for wastewater treatment plant operators who are responsible for the performance of laboratory analyses. For inexperienced analysts, emphasis will be placed on proper performance of basic laboratory procedures. For experienced analysts, emphasis will be placed upon advanced laboratory procedures and use of laboratory data in plant control.

The general objectives of this course are to enable treatment plant operators to perform basic sanitary analyses and utilize analytical data to improve operation. Emphasis is placed upon performance of analyses.

At the conclusion of this course, each student should be able to:

- accurately perform selected sanitary analyses
- set up and maintain an effective sampling program
- choose the proper control tests for his plant
- properly utilize laboratory data to achieve good in-plant control.

The course is based upon alternating presentations of lecture and laboratory sessions for each of the analysis covered. At least half of the course time will be devoted to laboratory.



**INSTRUMENTAL ANALYSIS OF
CHEMICAL POLLUTANTS IN THE
AQUATIC ENVIRONMENT (107)**

2 weeks

CINCINNATI, OHIO

April 17–28, 1972

This course is designed for professionals and technical specialists concerned with the selection and performance of procedures for the collection, identification and measurement of organic and inorganic pollutants in the aquatic environment. The training course "Chemical Analyses for Water Quality (100)" or previous experience associated with methodology pertaining to the measurement of chemical pollutants in water is prerequisite for attendance.

Upon completion of the course, the participant will be able to apply the fundamental concepts of infrared, thin-layer and gas chromatographic techniques for the analysis of organic pollutants and the technique of atomic absorption for the analysis of trace inorganic contaminants. He will have an understanding of the distribution and behavior of these pollutants in the environment and will be knowledgeable regarding improved techniques of sample preparation and automated analyses.

The analytical procedures taught in the course will conform to those currently in use by the Water Quality Office in its official investigation. In addition, attention will be given to implications of the latest research.

Classroom presentations will include:

- Collection and preservation of water, sediment and biological samples

- Extraction methodology

- Column and thin-layer chromatography

- Gas chromatography and detector technology applicable for the analysis of phenols, pesticides and digester gases

- Comparative methodology and quality control

Laboratory practice will comprise one-half of the course content and will include the following analyses:

- Gas chromatographic analysis of hydrocarbons and organophosphorus compounds

- Trace metals by atomic absorption

- Chlorinated hydrocarbons and phenyl alkanoic acid herbicides in water

- Organophosphorus and chlorinated hydrocarbon insecticides in sediment

- Automated analyses for nitrate, phosphorus and hardness.

**USE OF PHOTOGRAMMETRIC TECHNIQUES
FOR WATER POLLUTION CONTROL (110)**

1 week

CORVALLIS, OREGON December 6–10, 1971

This course is offered to employees of Federal and State agencies engaged in water pollution control programs. Such personnel may have either administrative or operational responsibilities and need not be experienced in the use of photogrammetric techniques.

This course may also be of interest to other personnel, already engaged in program activities involving the use of aerial photography, who wish to investigate other applications of this valuable tool.

Upon completion of this course, the student will be familiar with the theory and application of photogrammetric techniques to water pollution control programs.

Course topics will include the following:

- Basic fundamentals of photogrammetry

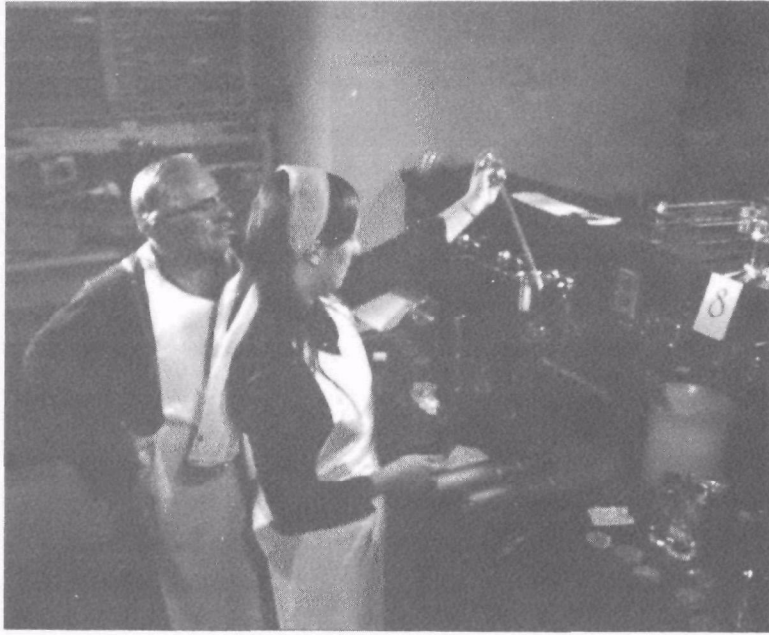
- Photointerpretation

- Aerial-photographic surveillance systems

- Applications of photogrammetric techniques to water pollution control programs

- Infrared and spectral photograph

Training will be accomplished through lecture presentations, classroom discussions and case studies. Students may volunteer to present for discussion their own problems of a technical nature.



**CURRENT PRACTICES IN WATER
MICROBIOLOGY (120)**

2 weeks

EDISON, NEW JERSEY December 6–17, 1971
CINCINNATI, OHIO Jan. 31–Feb. 11, 1972

This course is designed for professional bacteriologists and other laboratory personnel engaged in the bacterial analysis of water.

The basic objective of the training is to provide the participant with knowledge and understanding of the significance of bacterial indicators of pollution. He gains the necessary skills required for detecting, measuring, and evaluating these pollution indicators.

Emphasis is given to the results of traditional as well as to recent investigations of bacterial indicators of pollution, including coliforms, fecal coliforms and fecal streptococci. The characteristics, environmental occurrence significance and methods of detection and enumeration of these bacterial groups are studied in detail. In addition, attention is given to the detection of enteric pathogenic bacteria in polluted waters, as an adjunct to determination of indicator groups, and to the increasing utilization of such findings in investigations of water pollution.

Classroom presentations and extensive laboratory application give the participant opportunity to develop ability in use of the most suitable laboratory methods and in the interpretation of laboratory data. Both Standard Methods and promising new methods are included. Multiple dilution tube methods and membrane filter methods are featured in the laboratory studies.

The potential role of the microbiologist in water quality surveillance and in short-term pollution investigations is studied. Through this phase of the training it is expected that the student can increase the range of his contributions to the planning, conduct, and reporting of organized water quality studies.

**CHARACTERIZATION OF THE
FECAL STREPTOCOCCI (122)**

1 week

EDISON, NEW JERSEY April 24–28, 1972

This course has alternate prerequisites: either experience in a Public Health or Microbiology Laboratory, or academic training in Microbiology. The course is designed for bacteriologists or key technicians currently working in the laboratory.

The major course objective is to enable students to accurately perform laboratory analyses associated with assay of fecal streptococci in various types of water samples. A secondary objective is to enable the student to properly perform and evaluate biochemical and serological tests to species identification and final interpretation of data as they relate to pollution sources.

Instruction through lecture (25%) and laboratory work (75%) includes Multiple Dilution Tube (MPN) and Membrane Filter (MF) techniques for fecal streptococcus assay; various biochemical and serological tests used to delineate members of the group and an introduction to the use of fluorescent antibody techniques in fecal streptococcus identification.

Subject matter will also include definition, classification and relation of fecal streptococcus species to the host environment.

**FRESHWATER BIOLOGY AND
POLLUTION ECOLOGY (140)**

2 weeks

CINCINNATI, OHIO

June 5—16, 1972

This course is designed for technical personnel (other than biologists) engaged in water quality analysis and management; however, biologists new to this field may find it useful for orientation.

Within the framework of his personal background capacities, and experience, the student should be able, on completion of this course to:

Understand basic environmental factors impinging on aquatic communities

Recognize or identify to broad groups most freshwater organisms commonly encountered, using correct procedures and appropriate literature when available and also using judgment in assessing his own technical capacity in regard to the degree of identification attempted

Select and use appropriate common types of biological field collection equipment and procedures

Select and use appropriate types of biological laboratory analytical equipment and procedures

Analyze an aquatic community and assess the likelihood that it may have been disturbed by pollution.

Recognize biological indications or particular types of pollution when present

Predict possible effects of a given type of pollutant on a given habitat

Organize a field survey to determine the severity and extent of pollution

Course work includes lectures, discussions, problem assignments, and laboratory sessions. Field work is included to allow student participation in selecting and using biological field collection equipment and familiarization with biological communities.

Representative topics usually include:

Aquatic organisms of significance in pollution surveys

Lake, reservoir, and stream sampling

Types of aquatic insects

Use of artificial substrates

Thermal pollution

Investigation of fish kills

Environmental quality

Eutrophication in the freshwater environment

Water quality criteria for aquatic life

Biological magnification

Participants should bring appropriate clothing for field work, including rainwear. Boots will be supplied locally.

**BIOASSAY IN POLLUTION ANALYSIS
AND CONTROL (149)**

1 week

CINCINNATI, OHIO

November 8–12, 1971

This course is designed for those who need a practical competence in the design and use of bioassay and biomonitoring.

On completing this course the student should be able to select, design, construct, and operate a bioassay or biomonitoring setup adequate to meet most common needs in industry or regulatory organizations.

This course is considered to be at the application level. Knowledge will be provided for the most commonly accepted practices and principles involved in the laboratory use of aquatic organisms to detect or evaluate pollution.

The basic concept of the tolerance limit will be developed followed by the various ways by which it may be estimated. Static and flow through systems will be compared, as well as acute, sublethal, and chronic toxicity; single species versus community responses will be considered. Laboratory and field monitoring systems will be compared, and the types, sources, health, and care of experimental organisms that may be useful in different types of setups will be discussed.

Laboratory exercises and demonstrations constitute a significant portion of the course including an inspection trip to some nearby organization employing bioassay and/or related techniques if available.

The following topics are usually included as far as practicable:

The nature of the tolerance limit

Bioassay versus biomonitoring

The role of laboratory versus field studies in water quality and fish kill investigations

Chemical determinations associated with bioassay and biomonitoring

Experimental organisms: types, sources, care and use

The statistical design of bioassay

The interpretation and application of results

Case history studies of bioassay

Laboratory practice in design and construction of equipment, and in running bioassays

Laboratory demonstrations of additional types of setups.

BIOASSAY DILUTER CONSTRUCTION (149.1)

3 days

CINCINNATI, OHIO

By appointment

Facilities are available at Cincinnati for individually scheduled tutorial sessions on the design and construction of continuous flow dilution devices. These sessions are scheduled at the convenience of the trainee, subject to the availability of laboratory space. Three working days are usually required.

Consultation is available regarding the type and size of equipment needed, and practical training provided in certain critical construction skills. The trainee can actually construct and take home a diluter of his own if desired. He may be asked to provide certain items of equipment.

Application should be by letter to the Director, National Training Center, stating the need and degree of urgency.

ANALYTICAL QUALITY CONTROL (151)

1 week

CINCINNATI, OHIO

November 1-5, 1971

One of the fundamental responsibilities of management is the establishment of a continuing program to ensure the reliability and validity of analytical laboratory and field data gathered in water pollution control activities. This course is addressed to laboratory directors, leaders of field investigations, and other supervisory personnel who bear prime responsibility for water and wastewater data used by WQO. Specifically, this will include all WQO laboratories, WQO field investigations, and public or private agencies which are recipients of WQO grants or contracts involving analytical tests and measurements.

The subject matter of the course is concerned primarily with quality control for chemical and physical tests and measurements. Upon satisfactory completion of the course, the student will be familiar with the influence and recommendations for control of a wide range of factors which can bear upon the reliability and validity of analytical results obtained in water pollution investigations. Upon his return to his place of duty, the student will be in a position to inaugurate, or to reinforce, a program of analytical quality control which will emphasize early recognition, prevention and correction of factors leading to breakdowns in the validity of data.

As appropriate, lectures, panel discussions, workshop activities, and laboratory inspections will be used for development of the following areas of consideration in analytical quality control programs:

Need for internal quality control systems in analytical operations, and the motivation of all echelons of

personnel involved in development and operation of quality control procedures;

Development and validation of analytical methods, with particular reference to chemical and physical tests and measurements;

Measuring and maintaining quality standards of laboratory services, such as distilled water, electricity, and compressed air;

Specifications for laboratory instruments, evaluation, calibration, maintenance, and troubleshooting;

Quality requirements for precision glassware, care and cleaning;

Requirements for precise analytical work in preparation and use of reagents, purification, preparation and maintenance of primary standards;

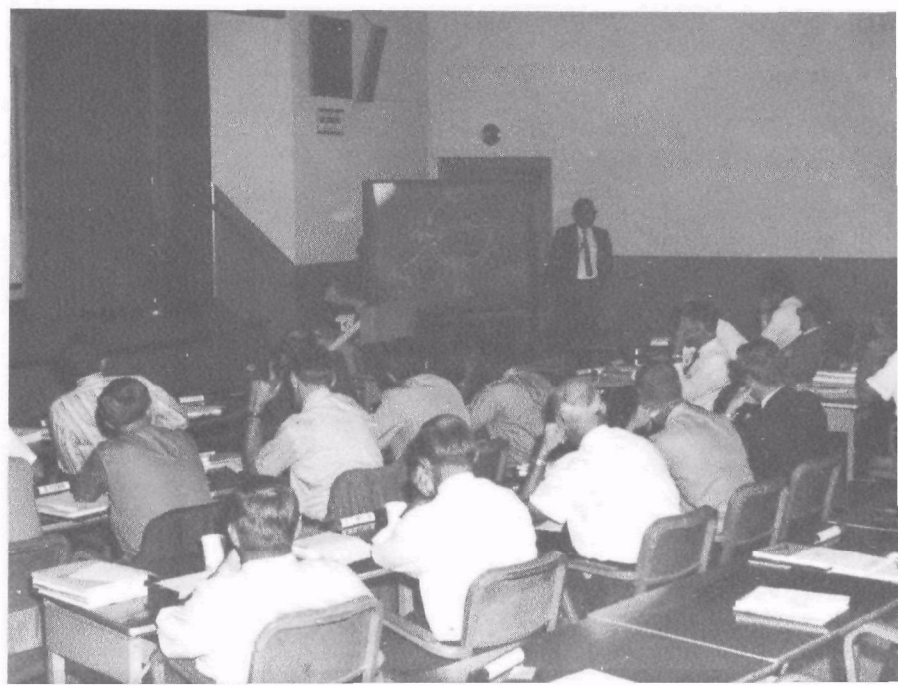
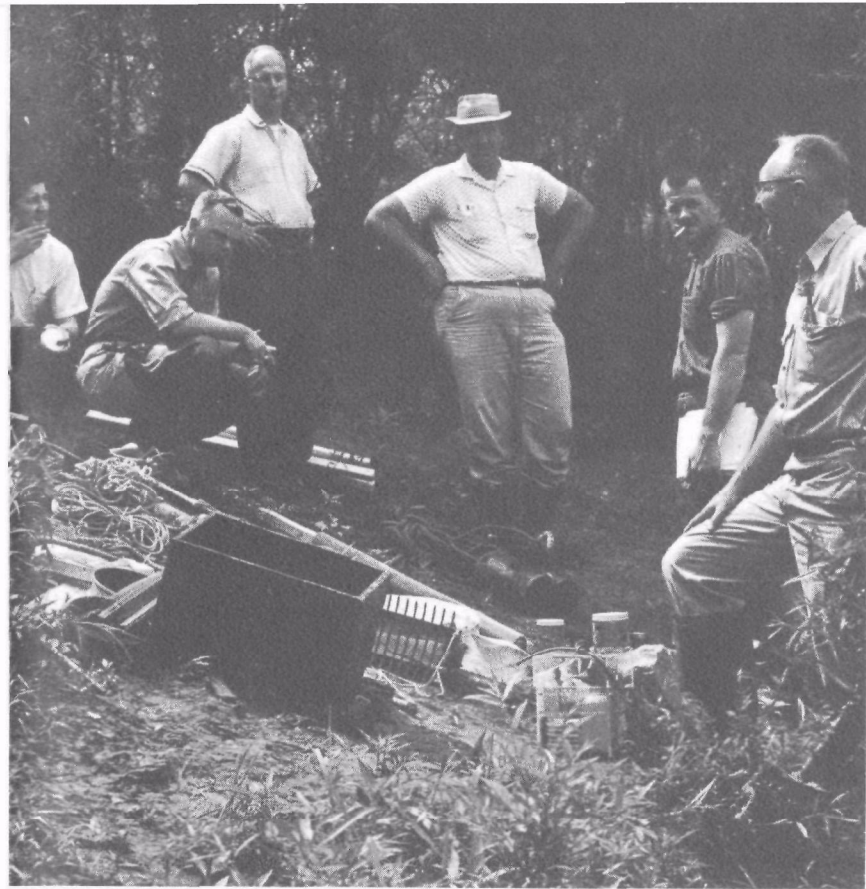
Use of control charts in laboratory operations; instructions for preparation and use, with consideration of relative merits of Cu Sum and Shewhart charts, use of control charts as a supervisory tool;

Determination of precision and accuracy of individual tests and measurements; use of standards, replicates, and spiked samples;

Data handling and reporting; sensitivity and detection limits, significant figures in reporting results, application of STORET;

Special problems in analytical control in gas chromatography, trace organics analyses;

Personnel aspects; skills and training required of analytical personnel, work loads and time requirements for routine analytical work, available training in water pollution analyses.



INTRODUCTION TO WATER QUALITY STUDY AND SURVEY COURSES

Identification and measurement of water quality conditions is contingent upon the application of knowledge specific to particular branches of physical and biological sciences. Overall water quality evaluation, on the other hand, requires understanding of the interaction and interrelationship of chemical and biological parameters, hydraulic principles and hydrologic conditions prevailing in a defined area (drainage basin). Programs to prevent or limit adverse water quality situations must correlate the technology of measurements and evaluation with understanding of socio-economic and legal conditions, concepts and principles prevailing in the human community.

The following five courses are concerned with the factors used to determine water quality and to recognize and evaluate pollution. As such, the courses contribute to the overall objective of supporting programs to prevent or limit water pollution.

Collectively, the coverage of the two courses "Field and Laboratory Activities in Water Quality Surveys (161.1)" and "Planning and Administrative Concepts of Water Quality Surveys (161.2)" is basically the same as "Water Quality Studies (161)." The emphasis and depth of coverage is varied to serve the needs of professional personnel having diverse types of responsibilities in planning, performing and administering programs related to water quality. To select the appropriate course(s), applicants should review the individual course descriptions in terms of their particular interest and program responsibility.

WATER QUALITY STUDIES (161)

2 weeks

CINCINNATI, OHIO September 13–24, 1971

CORVALLIS, OREGON July 12–23, 1971
June 19–30, 1972

FAIRBANKS, ALASKA* August 9–20, 1971

This course is offered for engineers, chemists, aquatic biologists, microbiologists and other professional specialists having administrative and operational responsibilities in planning and conducting water pollution surveys. The course is designed to be of greatest benefit to new professional workers in the field and to experienced workers whose normal duties in water quality surveys are too specialized to provide an overall view of the many special factors entering into the summation of an expression of water quality determination.

The course is intended to help participants understand the interdependency of various technical disciplines in evaluating water quality. Each student should be better able to identify his role and coordinate activities with other survey participants. He will be able to perform selected tests and measurements in each of the major areas of water quality surveys.

Students participate in classroom presentations, demonstrations and panel discussions. Field trips are conducted to local sites which are representative of the region in which the course is given. During the field trips students engage in observations and tests widely used by chemists, aquatic biologists and engineers in on-site studies. They collect samples for subsequent laboratory study and perform representative studies in the biology, microbiology, and chemistry laboratories.

Depending upon locations, major subject areas of the course may include:

- Sources and causes of deterioration of environmental water quality
- Tests and measurements used in evaluation of water quality by biologists, chemists, and microbiologists. This aspect of the course includes consideration of new technical developments in instrumentation and laboratory methodology.
- Fundamental factors in planning, conducting, interpreting findings and reporting results of a water pollution survey
- Special categories of water quality studies, including ground water quality studies, tidal water studies, water pollution surveillance networks.
- Goals for water quality from the viewpoint of municipal and industrial water supplies, fish and wildlife management, agricultural usage and recreational use of water.

*Applications for the Fairbanks, Alaska course should be submitted to:

Manpower and Training Officer
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

1 week

This course is designed for personnel actively engaged in field projects of water quality measurements and pollution identification. Emphasis is placed on understanding interdisciplinary needs and responsibilities in the accumulation and interpretation of data from field and laboratory activity.

Flow measurements and current studies.

PLANNING AND ADMINISTRATIVE CONCEPTS OF WATER QUALITY SURVEYS (161.2)

1 week

This course is organized for the benefit of supervisory personnel and administrators responsible for planning and implementing programs to evaluate or improve water quality conditions.

Recommendation for future action (including possible alternatives) based on knowledge of socioeconomic conditions and legislative authorization.

**INDUSTRIAL LIQUID WASTES
SURVEYS (161.4)**

1 week

EDISON, NEW JERSEY May 15—19, 1972

This course is offered for engineers, chemists, or other professional personnel concerned with planning or conducting industrial liquid waste surveys. Such surveys may be intended to measure or characterize wastes at outfalls or in-plant locations, or both.

A student who completes this course will be able to plan, supervise, and evaluate an industrial waste survey. More specifically, he will be able to:

- Formulate and write valid survey objectives
- Specify pre-survey information requirements
- Apply good public relations practices with industry
- Select sampling points and locations
- Prescribe type of sample and frequency or interval
- Determine appropriate analyses and methods
- Choose optimum flow measurement methods and locations
- Determine personnel and equipment requirements
- Establish a coordinated work schedule for field and laboratory operations
- Evaluate progress and adjust plans as required
- Evaluate the extent to which data and activities have met survey objectives.

This course includes a class survey of an actual industrial installation. Students should bring clothing appropriate for such field work. Lectures, workshops, and demonstrations are used to provide instruction in planning. Field trips and laboratories constitute actual survey operations.

The class will be divided into groups each of which will be responsible for planning, conducting, and evaluating a survey under instructor supervision. The course will constitute an intensive period of training; students should be prepared to participate in evening sessions.

**BIOLOGICAL TREATMENT
TECHNOLOGY (162)**

2 weeks

CINCINNATI, OHIO Sept. 27—Oct. 8, 1971

This course is offered for engineers, chemists, and other professional personnel concerned with selection, design, or control of biological processes for wastewater and sludge treatment.

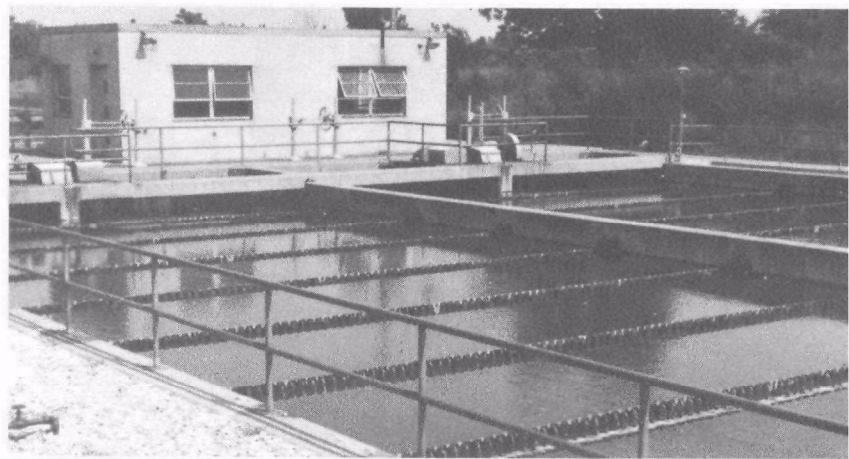
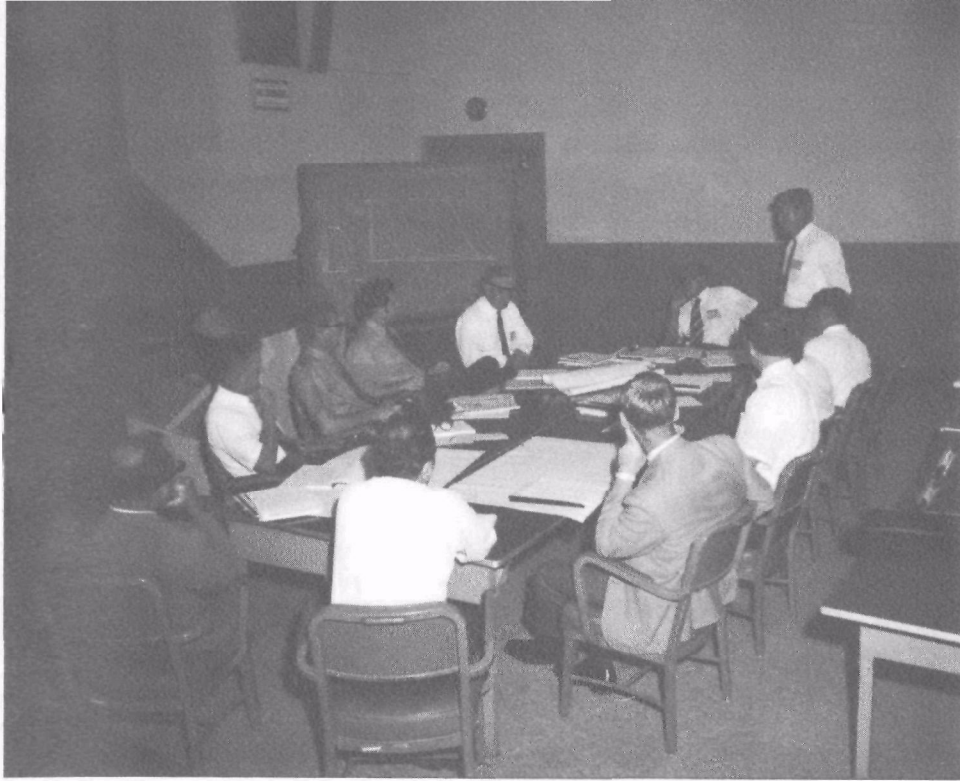
The course will enable participants to evaluate treatment feasibility, select and design a biological process, and control the biological treatment system for treatable wastewaters.

Problems characteristic of selected specialized wastewaters are considered within the framework of their effects upon joint industry-municipal treatment in most cases. Most of the concepts are valid for separate treatment. Aerobic, anaerobic and facultative treatment processes are considered. Participants are involved in lectures, discussion, demonstrations, and problem sessions on principles and applications of treatment technology.

A major portion of the course is devoted to the evaluation of treatability investigations for upgrading conventional biological processes or applying them in unusual or troublesome situations. Batch or continuous laboratory or pilot plant operations are considered as an aid in improving plant scale performance control or isolating problems requiring special consideration in process selection, design or operation.

Topics considered include evaluation of pertinent measured indices useful for information retrieval for guidance in selection, design and operation of wastewater treatment such as oxygen demand or respiratory activity, distribution or transfer dynamics, organic and hydraulic loading, solids production and characteristics, cyclic behavior and nonpollutional disposal of objectionable components among various aerobic, anaerobic, or facultative biological processes.

The individual who requires broader coverage of wastewater treatment technology should also consider future enrollment in courses "Physical-Chemical Treatment Technology (172.1)" and "Advances in Treatment of Domestic Wastes (172.2)."



**CONTROL OF OIL AND OTHER
HAZARDOUS MATERIALS (165)**

3 days

EDISON, NEW JERSEY October 13–15, 1971
ATHENS, GEORGIA April 11–13, 1972

This course is offered for employees of regulatory agencies who are assigned direct responsibility for control and alleviation of the effects of nonrecurring discharges of oil and other hazardous materials.

Upon completion of the course the student will be able to operate within interagency policies and guidelines concerning individual and agency responsibilities in event of discharge of oil and other hazardous materials.

Considerable time is spent in explanation of Contingency Plans and Government regulations pertaining to such discharges. Procedures for satisfying these requirements and procuring technical services of the Environmental Protection Agency are explained using actual examples and case histories. The problems associated with oil spills, and suggested protective and remedial measures are emphasized. Training is accomplished through lecture presentations, discussions, and—most important—the case-situation method. Participants will have an opportunity to practice response during such lessons.

**GEOHYDROLOGIC RELATIONSHIPS
IN WATER POLLUTION (168)**

4 days

ADA, OKLAHOMA March 6–9, 1972

This course is intended for professional and technical personnel who are involved in operational programs of ground-water quality control.

Upon course completion the student will have an expanded capability of executing and managing operational programs of ground water quality determination and control.

Basic principles of geology and ground water hydrology are reviewed in specific relationships to their effect on ground water quality and quantity.

Principles, methods, and technology for determining or evaluating ground water hydraulic and aquifer characteristics are presented.

Legal and administrative aspects of ground water management are considered in terms of present statutes and need for new legislative policies reflecting current technology and anticipated utilization of the ground water resource.

Topics to be included in the course agenda will reflect recent investigations and research studies as appropriate in relation to:

Natural salt pollution and salt water intrusion

Ground water recharge

Pollution from waste disposal practices

Deep well disposal of oil field brine and industrial wastes

Agricultural practices

Mining practices

**PHYSICAL-CHEMICAL TREATMENT
TECHNOLOGY (172.1)**

1 week

CINCINNATI, OHIO January 10–14, 1972
ATHENS, GEORGIA February 14–18, 1972

This course is offered for engineers, chemists, and other professional personnel concerned with selection, design, and operational supervision of physical and/or chemical methods of wastewater and sludge treatment.

Upon course completion the student will have strengthened capability to evaluate the feasibility of treating wastewater by physical or chemical methods, select and design an appropriate process, and apply accepted control techniques to produce an acceptable effluent and conditioned sludge.

Students participate in lectures, discussions, demonstrations and problem solving designed to illustrate principles, advantages, limitations, feasibility and economics of topic applications. The approach is a blend of the rational (theoretical) and the empirical (based on experience) methods of problem solving.

Course topics may include cooling, sedimentation, flocculation, mixing, flotation, vacuum filtration, solids concentration and drying, and neutralization.

The individual who requires broader coverage of wastewater treatment technology should also consider future enrollment in courses "Biological Treatment Technology (162)" and "Advances in Treatment of Domestic Wastes (172.2)."

**ADVANCES IN TREATMENT OF
DOMESTIC WASTES (172.2)**

1 week

ATHENS, GEORGIA October 18–22, 1971
CINCINNATI, OHIO January 17-21, 1972

This course is offered for professional personnel concerned with selection, evaluation, and improvement of methods for advances in treatment of domestic wastes. The course may be of special interest to employees of regulatory agencies and consulting engineering firms.

Upon completion of the course the student will have increased competence to compare alternative methods and select processes to meet critical product quality and economic requirements.

Course content includes operations and processes selected to tailor used water quality to fit beneficial reuse requirements beyond those possible with conventional treatment. This may involve more complete removal of general contaminants or special processes designed to remove components inefficiently removed by conventional processing.

Students will participate in lectures, discussions, problem solving, demonstrations, laboratory and case histories designed to increase their capabilities in the selection, design and operational control of treatment facilities considering rational, empirical and socio-economic factors.

In accordance with local requirements, course topics are selected from the following:

- Filtration and screening
- Chemical clarification
- Granular and powdered carbon absorption
- Oxidation
- Distillation
- Electrodialysis
- Ion exchange
- Reverse osmosis
- Phosphate removal
- Nitrogen removal
- Disinfection
- Ultimate disposal
- Upgrading conventional treatment

This is a companion course to Course No. 162, "Biological Treatment Technology" and Course No. 172.1, "Physical-Chemical Treatment Technology." It is recommended that prospective trainees complete these courses or possess equivalent prior experience.

ORIENTATION TO WASTEWATER TREATMENT OPERATION (173)

1 week

CINCINNATI, OHIO
CORVALLIS, OREGON

August 2–6, 1971
April 3–7, 1972

This course is offered for personnel who are inexperienced in treatment plant operations. It is also recommended for those individuals in state and regional programs who are responsible for designing and conducting operator training courses.

Upon course completion the student will be familiar with:

Characteristic effects of wastewaters upon water quality

Treatment operations used to remove objectionable pollutants

Basic factors of operational control and maintenance

Essentials of testing plant performance and reporting results

The operator's function in water pollution control

Treatment facilities will be presented in terms of unit operations such as collection, pumping, clarification, mixing, flocculation, aeration, oxidation and incineration. Engineering applications of these will be combined into processes in terms of the biological, chemical or physical behavior. Typical plant schematic diagrams will be used to facilitate recognition of plant units, their function and care. The same schematics will be used in presentation of basic tests, and calculations involving flow, concentration and loading as used for plant operational reports.

The teamwork approach will be stressed among the operator, his associates, his supervisors, his public, and local, state or regional agencies with respect to the services and information expected from him and the nature of assistance that he may obtain from others.

PLANNING, DEVELOPMENT AND MANAGEMENT OF WASTEWATER TREATMENT FACILITIES (175)

1 week

CINCINNATI, OHIO July 19–23, 1971

This course is intended for planning and management personnel from public and private agencies planning to install new wastewater treatment facilities or to undertake major construction to improve existing facilities.

Participation in the course is expected to strengthen the capability of the student to plan, develop, and implement facilities for wastewater treatment.

As appropriate, lectures, panel discussions, general discussions, and case studies are used in consideration of the following topics:

Responsibilities and interrelationships of Federal, State and local agencies concerned with water quality enhancement

Public relations techniques designed for information and development of support before, during and after project development

Essential steps necessary to evaluate existing conditions and needs in line with water quality objectives

Considerations involved in financing planned construction of needed facilities

Interrelationships of the Consultant, Contractor, public agencies and the public in the water pollution control effort.

The human factor will be stressed in making the completed facility a functional entity. Means whereby operating personnel may be motivated and trained to recognize proper function of each element of the facility and to achieve optimum performance on a continuing basis will be considered.

SEWAGE TREATMENT FACILITIES FOR FEDERAL INSTALLATIONS (177)

1 week

CINCINNATI, OHIO July 12–16, 1971

CORVALLIS, OREGON October 4–8, 1971
November 8–12, 1971

This course is offered for supervisors, engineers, and other Federal personnel responsible for design, construction, or management of sewage disposal facilities at Federal installations. The course may also be of interest to engineers and supervisors in State and local agencies having responsibility for recreational areas and small institutions.

On completion of this course, the student will have requisite technical information to assess a sewage treatment and disposal problem and to select the most advantageous system for a given location.

The course will cover waste treatment methods including those applicable to installations such as National Parks, Forest Service camps, small military installations, hospitals, schools and prisons.

In addition to the technical aspects of waste treatment and disposal, the legal responsibilities of public agencies, as they relate to adequate sewage treatment and disposal will be covered.

Course topics include:

- Federal policy and guidelines, Executive Order 11507.
- States' criteria and requirements
- Septic tank and drainfield applications
- Secondary sewage treatment methods
- Sewage lagoon applications
- Tertiary treatment methods
- Disinfection of effluents
- Surveillance and operational controls
- Preliminary engineering studies.

ANALYSIS AND CONTROL OF THERMAL POLLUTION (178)

4 days

CINCINNATI, OHIO December 13–16, 1971

ATHENS, GEORGIA March 13–16, 1972

This course is designed for professional personnel concerned with the evaluation, design, operation or monitoring of thermal discharges. Orientation in the biological significance of thermal discharges is also included.

On completion of this course the student should be able to:

- Evaluate the potential magnitude and extent of a heated discharge from a power plant or a cooling discharge from a storage reservoir

- Determine the nature and size of treatment structures necessary to produce an acceptable level of discharge temperature

- Understand the thermodynamic behavior of rivers and impoundments and the potential biological needs of aquatic organisms so that optimum types of discharge devices may be installed

Instruction includes an overview of the present day magnitude and future potential of thermal discharges with special reference to power production plants of various types. Orientation is also provided in the potential biological effects of both artificially heated and cooled waters and in the significance of the rate of change of temperature. Class problem sessions in small groups enable the student to obtain personal practice in the calculations necessary for predicting the physical impact of various types of thermal discharge. Types of biological information needed to evaluate the potential effectiveness of the engineering predictions are also included.

Representative topics include:

- Thermal sources and loads
- Physical and chemical effects of thermal pollution
- Biological effects of various types of thermal discharges
- Process changes
- Waste heat utilization
- New methods of power generation
- Power generation
- Cooling devices
- Dispersion, dilution and flow regulation
- Water temperature prediction
- Data requirements, field studies and instrumentation
- Work problem sessions.

**PERFORMANCE EVALUATION OF WASTE-
WATER TREATMENT FACILITIES (179)**

1 week

CINCINNATI, OHIO

May 22–26, 1972

This course is intended for local, State, Federal and industrial personnel responsible for inspection and evaluation of wastewater treatment plant facilities, staffing, budget, and performance.

The course participant should acquire enhanced ability for meaningful inspection and evaluation by learning what to look for, how it fits into the performance pattern and to interpret it in terms of treatment problems.

Course presentation includes lectures, discussion, case problem sessions. Course topics may include the following, subject to interest and availability of session leaders at course time:

Facilities inspection

Techniques for evaluation of receiving water and effluent requirements, design and present loading, collection, equipment condition and adequacy, versatility characteristics, control, past history.

Personnel and staff organization

Evaluation of present personnel in line with management, inspection, testing, operating, records, maintenance and overall manpower requirements. Does it appear to be an integrated system?

Financial Status

Techniques for checking budget adequacy for meeting routine, contingency and future demands. How is the project financed?

Records evaluation

Things to look for in relationship to plant performance, preventative maintenance, plant-community relations.

**OPERATOR INSTRUCTOR
DEVELOPMENT (180)**

1 week

CINCINNATI, OHIO

August 9–13, 1971

ADA, OKLAHOMA

September 13–17, 1971

This course is offered for persons having a responsibility for designing, managing and/or conducting various types of "short courses" for wastewater treatment plant operators.

Upon completion of the course the student will be able to write proper course objectives, design a course for a specific training level, and evaluate course content and course value. He will be able to prepare and present a meaningful talk to an audience. He will be able to advise others on types of instruction, classroom management, and proper instruction techniques.

The course will review current teaching methods and the preparation and management of short term training courses. Considerable time will be devoted to discussion and practice of training methods and materials. Special attention will be given to the material that should be included and excluded from operator short courses and to levels of instruction. A portion of the course will be devoted to a review and discussion of existing course materials available for the training of wastewater plant operators.

Topics to be covered include:

- Determination of training needs and objectives
- Course design
- Preparation and use of training aids
- Evaluation of training courses

Continuing construction and expansion of wastewater treatment facilities by all segments of society, coupled with an expanded technology, has increased the need for training and upgrading wastewater treatment plant operators. Many persons concerned with giving this training have had no formal instruction in teaching. This course will fill, in part, a special growing need in the water pollution control field.

**BASIC ENVIRONMENTAL
STATISTICS (801)**

1 week

CINCINNATI, OHIO January 24–28, 1972
EDISON, NEW JERSEY March 6–10, 1972

This course is designed to introduce the concepts and applications of statistics to environmental health studies. It is for professional personnel responsible for the collection and analysis of consumer protection and/or environmental health service data with emphasis on parametric tests of significance. Enrollees are required to complete a programmed text of home study (approximately 40 hours) in basic statistics prior to the reporting date. The text is sent to students about 6 weeks before the course begins, hence early enrollment is encouraged.

Major agenda topics include:

- Basic statistical concepts
- Single sample quantitative inference
- Comparing two samples
- Linear and multivariate relationships
- Single sample qualitative inference
- Comparing two percentages
- Chi Square tests
- Short-cut test of significance
- Treatment of outliers
- Graphical analysis of data.

**ENVIRONMENTAL STATISTICS –
SAMPLE SIZE DETERMINATION (815)**

1 week

CINCINNATI, OHIO April 3–7, 1972

Prerequisite: *Basic Environmental Statistics (801)* or equivalent training.

This course is designed to familiarize experimentalists with the kind of information required for sample size determination as well as providing them with elementary procedures, formulas, and tables for choosing an economical sample size. Features of particular value are the consideration of 40 different research objectives and formulas necessary to achieve the objectives. A case example is worked out in each instance and the necessary tables are supplied.

Major agenda topics include:

- Nature of statistical inference
- Sampling experiment objective
- Observation variability
- Power-function approach
- Estimation problems
- Tests of hypotheses
- Selection problems
- Sequential sampling
- Decision-function approach.

OTHER TRAINING COURSES

The Training Program of the Water Quality Office, Environmental Protection Agency has, in recent years developed and conducted numerous courses not scheduled in the period covered by this edition of the Bulletin. Among these may be listed the following, which may be offered upon demonstration of need for the training:

Course No.	Length	Title
100.0	1 week	Basic Water Quality Chemistry
100.2	1 week	Survey of Chemical Analyses for Water Quality
101	2 weeks	Characterization and Treatment of Organic Industrial Wastes
102	2 weeks	Inorganic Industrial Wastes Characterization
103	2 weeks	Analysis of Pesticides in the Aquatic Environment
103.3	3 days	Pesticide Ecology Seminar
105	2 weeks	Laboratory Analyses in Treatment Plant Operations
120.1	1 week	Survey of Current Practices in Water Microbiology
121	1 week	Membrane Filter Methods in Treatment Plant Operations
140.1	1 week	Basic Freshwater Biology
140.2	1 week	Freshwater Pollution Ecology
140.3	1 week	Orientation to Freshwater Biology and Pollution Ecology
141	2 weeks	Plankton Analysis
142	1 week	Introductory Microscopic Analysis of Water
144	2 weeks	Marine Biology and Pollution Ecology
144.1	1 week	Basic Marine Biology
144.2	1 week	Marine Pollution Ecology
146	3 days	Aquatic Ecology Seminar
146.1	3 days	Marine Pollution Ecology Seminar
146.2	3 days	Freshwater Pollution Ecology Seminar
150	1 week	Laboratory Quality Control
161.3	1 week	Estuary Studies
161.5	1 week	Field Investigation and Sampling Techniques
163	1 week	Current Problems in Water Quality Management
167	1 week	STORET System
169	1 week	Pollution Problems Related to Groundwater
174	1 week	Basic Principles of Wastewater Treatment Operation
176	3 days	Water Pollution Control for Federal Installations
802	1 week	Environmental Statistics—Design of Experiment
804	1 week	Environmental Statistics—Nonparametric
806	1 week	Environmental Statistics—Analyzing Qualitative Data
810	1 week	Environmental Statistics—Applied Regression Analysis
820	1 week	Environmental Statistics—Survey Sampling
897		Computational Analysis Techniques for Managers
899		Mathematic Science Seminars

If need for any of these courses, or in any other area of specialized technical training in the field of water quality control is recognized, the reader is invited to bring the need to any of the Water Quality Office training units listed in this Bulletin. Such recommendations will receive full consideration in development of future training plans and schedules.

Ada, Oklahoma
Athens, Georgia
Cincinnati, Ohio
Corvallis, Oregon
Edison, New Jersey

**WATER
QUALITY
OFFICE
FACILITIES**

DIVISION OF MANPOWER AND TRAINING

OFFERING

TRAINING

THE ROBERT S. KERR WATER RESEARCH CENTER

P.O. Box 1198

Ada, Oklahoma 74820

Commercial telephone number: Area Code 405 332-8800

FTS calls may be placed through Oklahoma City FTS Operator
(405-236-2311); ask for Ada 332-8800.



COURSES TO BE OFFERED BY
THE ROBERT S. KERR WATER RESEARCH CENTER
Ada, Oklahoma

Operator Instructor Development (180) September 13–17, 1971

Field and Laboratory Activities in
Water Quality Surveys (161.1) October 18–22, 1971

Fish Kill Investigation Technology (143) November 2–4, 1971

Planning and Administrative Concepts
of Water Quality Surveys (161.2) January 17–21, 1972

Geohydrologic Relationships in Water
Pollution (168) March 6–9, 1972

Field and Laboratory Activities in
Water Quality Surveys (161.1) May 1–5, 1972

**ADDITIONAL SEMINARS, COURSES, AND WORKSHOPS OFFERED DURING
THE FISCAL YEAR WILL BE ANNOUNCED THROUGH SEPARATE RELEASES.**

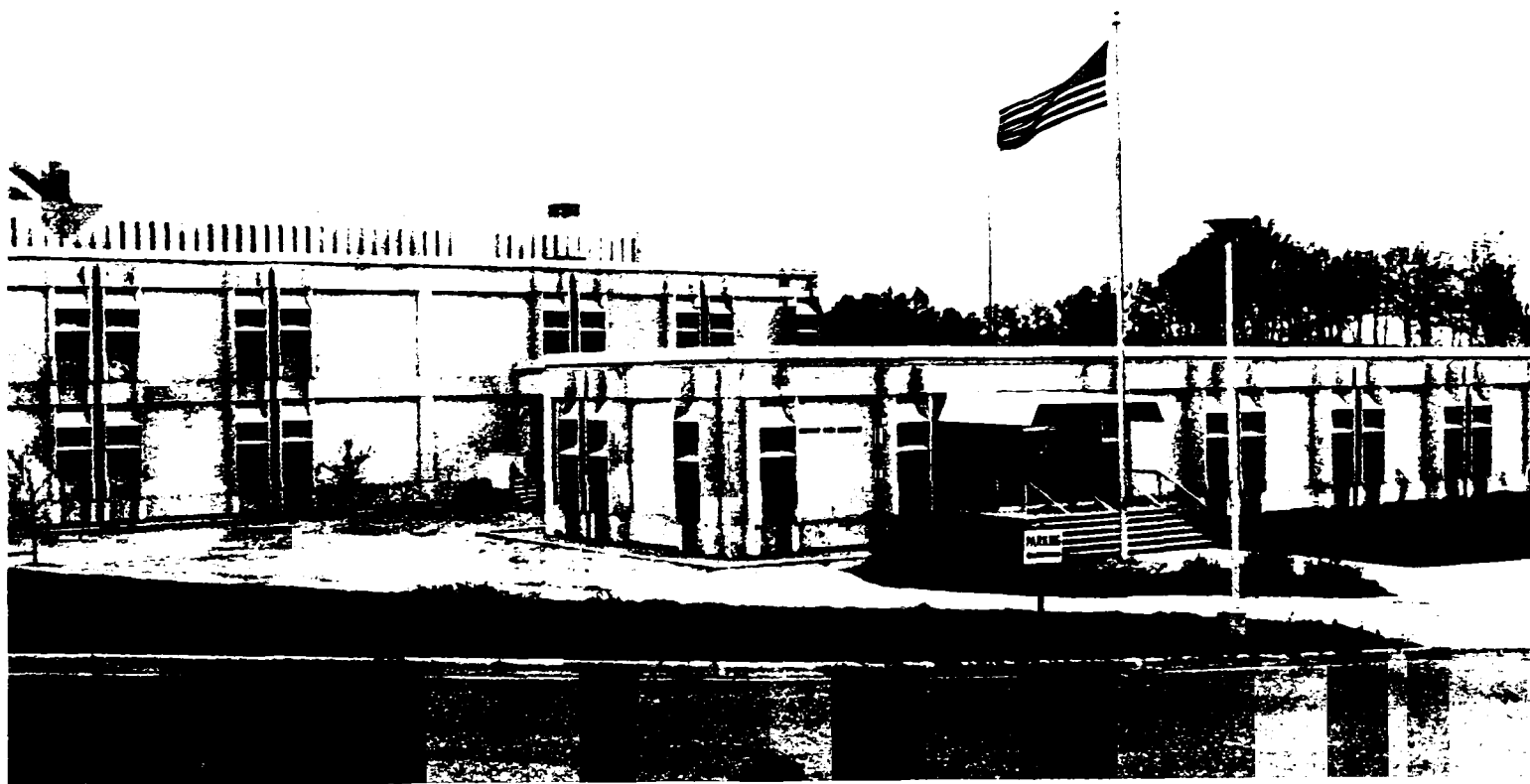
THE SOUTHEAST WATER LABORATORY

College Station Road

Athens, Georgia 30601

Commercial telephone number: Area Code 404—546-3161

FTS number: 404—546-3161



COURSES TO BE OFFERED BY
THE SOUTHEAST WATER LABORATORY
Athens, Georgia

Advances in Treatment of Domestic Wastes (172.2)	October 18—22, 1971
Pesticide Residue Analysis in Water (103.1)	November 8—12, 1971
Pesticide Residue Analysis in Water (103.2)	December 6—10, 1971
Physical-Chemical Treatment Technology (172.1)	February 14—18, 1972
Analysis and Control of Thermal Pollution (178)	March 13—16, 1972
Control of Oil and Other Hazardous Materials (165)	April 11—13, 1972
Field and Laboratory Activities in Water Quality Surveys (161.1)	May 8—12, 1972

ADDITIONAL SEMINARS, COURSES, AND WORKSHOPS OFFERED DURING
THE FISCAL YEAR WILL BE ANNOUNCED THROUGH SEPARATE RELEASES.

THE ROBERT A. TAFT SANITARY ENGINEERING CENTER

4676 Columbia Parkway

Cincinnati, Ohio 45226

Commercial telephone number: Area Code 513-871-1820, Ext. 259

FTS number: 8-513-871-6259



**COURSES TO BE OFFERED BY
NATIONAL TRAINING CENTER
Cincinnati, Ohio**

Sewage Treatment Facilities for Federal Installations (177)	July 12—16, 1971
Planning, Development and Management of Wastewater Treatment Facilities (175)	July 19—23, 1971
Orientation to Wastewater Treatment Operation (173)	August 2—6, 1971
Operator Instructor Development (180)	August 9—13, 1971
Chemical Analyses for Water Quality (100)	August 16—27, 1971
Water Quality Studies (161)	September 13—24, 1971
Biological Treatment Technology (162)	Sept. 27—Oct. 8, 1971
Analytical Quality Control (151)	November 1—5, 1971
Bioassay in Pollution Analysis and Control (149)	November 8—12, 1971
Analysis and Control of Thermal Pollution (178)	December 13—16, 1971
Physical-Chemical Treatment Technology (172.1)	January 10—14, 1972
Advances in Treatment of Domestic Wastes (172.2)	January 17—21, 1972
Basic Environmental Statistics (801)	January 24—28, 1972
Current Practices in Water Microbiology (120)	January 31—February 11, 1972
Chemical Analyses for Water Quality (100)	February 28—March 10, 1972
Environmental Statistics — Sample Size Determination (815)	April 3—7, 1972
Instrumental Analysis of Chemical Pollutants in the Aquatic Environment (107)	April 17—28, 1972
Performance Evaluation of Wastewater Treatment Facilities (179)	May 22—26, 1972
Freshwater Biology and Pollution Ecology (140)	June 5—16, 1972

ADDITIONAL SEMINARS, COURSES, AND WORKSHOPS OFFERED DURING THE FISCAL YEAR WILL BE ANNOUNCED THROUGH SEPARATE RELEASES.

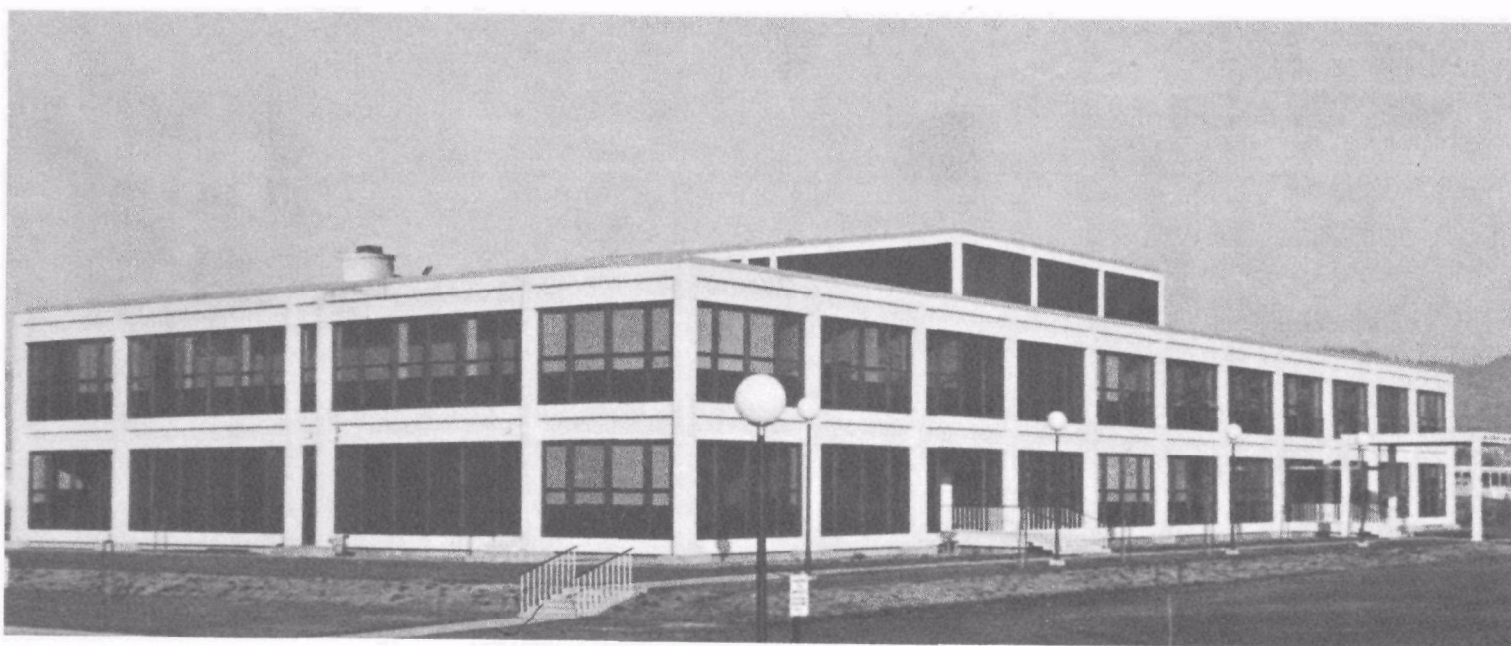
THE PACIFIC NORTHWEST WATER LABORATORY

200 South 35th Street

Corvallis, Oregon 97330

Commercial telephone number: Area Code 503—752-4281, Ext. 318

FTS number: 503—752-4318



COURSES TO BE OFFERED BY
THE PACIFIC NORTHWEST WATER LABORATORY
Corvallis, Oregon

Water Quality Studies (161)	July 12—23, 1971
Water Quality Studies (161)	August 9—20, 1971 (Alaska)
Sewage Treatment Facilities for Federal Installations (177)	October 4—8, 1971
Sewage Treatment Facilities for Federal Installations (177)	November 8—12, 1971
Use of Photogrammetric Techniques in Water Pollution Control (110)	December 6—10, 1971
Chemical Analyses for Water Quality (100)	January 31—February 11, 1972
Orientation to Wastewater Treatment Operation (173)	April 3—7, 1972
Water Quality Studies (161)	June 19—30, 1972

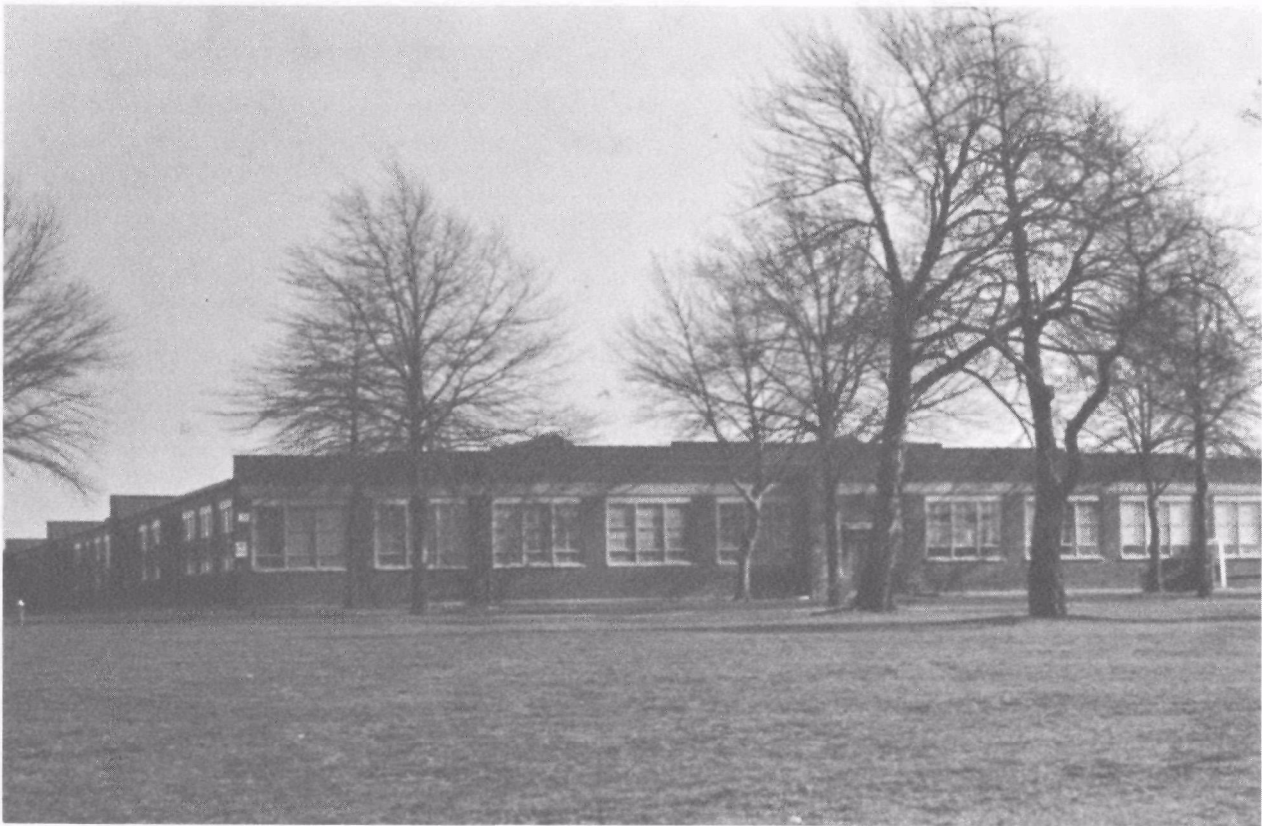
ADDITIONAL SEMINARS, COURSES, AND WORKSHOPS OFFERED DURING
THE FISCAL YEAR WILL BE ANNOUNCED THROUGH SEPARATE RELEASES.

EDISON WATER QUALITY LABORATORY

Edison, New Jersey 08817

Commercial telephone number: Area Code 201-548-3000

FTS number: 201-548-3415



COURSES TO BE OFFERED BY
EDISON WATER QUALITY LABORATORY
Edison, New Jersey

Control of Oil and Other Hazardous Materials (165)	October 13—15, 1971
Current Practices in Water Microbiology (120)	December 6—17, 1971
Laboratory Analyses in Treatment Plant Operations (105)	January 17—21, 1972
Basic Environmental Statistics (801)	March 6—10, 1972
Characterization of the Fecal Streptococci (122)	April 24—28, 1972
Industrial Liquid Waste Surveys (161.4)	May 15—19, 1972

**ADDITIONAL SEMINARS, COURSES, AND WORKSHOPS OFFERED DURING THE
FISCAL YEAR WILL BE ANNOUNCED THROUGH SEPARATE RELEASES.**

**WATER
QUALITY
OFFICE**

WATER HYGIENE DIVISION

OFFERING

TRAINING



WATER HYGIENE DIVISION

In the business of providing drinking water to the citizens of this nation, the greatest training need, at present, is among the 72,000 people who manage and operate the nation's water supply systems, while the most serious manpower shortage is of engineers, technicians, and laboratory staff to conduct adequate surveillance and technical assistance programs. To emphasize the training of operators without first, or at least concurrently, addressing the second problem, would have little impact on the situation, since the continued success of a training program for managers and operators depends heavily on adequate follow-up and technical assistance programs. A dual thrust must therefore be made to ameliorate both of these deficiencies.

The Water Hygiene Division will attempt, as far as resources permit, to present a training program balanced to satisfy the training needs of both of these categories, shifting emphasis to the second category as the manpower shortage is reduced.

In addition, greater efforts are being made to provide courses closer to home. Training courses have been developed that can be presented in the field (as noted in the Description of Courses) in cooperation with state and local water supply agencies. The course "Fluoride Determinations in Water" has been scheduled, in cooperation with state health departments, for four field presentations. We look forward to working with these and other agencies not only in the development and presentation of this course, but also in the development of other courses to meet local training requirements.

It is an opportunity both challenging and rewarding. Public water supplies provide the citizens of this nation with unquestionably the nation's most precious finished product. Evidence indicates however, that there is a gradation in the reliability of both the delivery and quality of the water provided by the more than 30,000 public supplies. Some may be rated excellent. Others urgently need improvement. Training is an essential element of the improvement program. It is through these courses, but more importantly through adequate training programs at state and local levels, that the operation of all water supplies will approach the level of excellence that modern technology makes possible.



COURSES TO BE OFFERED BY

WATER HYGIENE DIVISION

Cincinnati, Ohio

Ground Water Technology (161WH)	Sept. 27, Oct. 1, 1971
Special Analytical Techniques—Gas Chromatography (710WH)	Oct. 11—15, 1971
Water Supply Sanitary Survey (160WH)	Dec. 6—10, 1971
Fluoride Determinations in Water (142WH)	Jan. 11—13, 1972
Unit Processes — Water Treatment Plant Operation (158WH)	Jan. 17—21, 1972
Special Analytical Techniques — Thin Layer Chromatograph (711WH)	Feb. 14—16, 1972
Fluoride Determinations in Water (142WH)	March 14—16, 1972
Operation and Control of Water Systems Supplied From Wells (157WH)	March 27—31, 1972
Chemical Examination of Drinking Water (141WH)	April 10—14, 1972
Bacteriological Examination of Drinking Water (140WH)	May 8—12, 1972
Special Analytical Techniques — Atomic Absorption (712WH)	June 5—7, 1972

COURSE DESCRIPTIONS

**BACTERIOLOGICAL EXAMINATION OF
DRINKING WATER (140WH)**

1 week

Cincinnati, Ohio May 8-12, 1972

This course is designed to provide microbiological training to individuals directly involved in laboratory control activities relating to safe water supplies.

It provides considerable laboratory experience in the standard techniques currently recommended for determining the quality of safe water while furnishing the trainee with sufficient background material to enable him to understand the principles involved in each procedure and the philosophy of the laboratory examination as it relates to water quality and public health.

The following techniques and their application are considered in the laboratory phase of the course:

Estimation of the coliform density by the multiple-tube fermentation technique, including the presumptive, confirmed, and completed tests for coliforms as well as testing for fecal coliforms.

Status of bacteriological procedures used by various state and municipal laboratories.

Tests for the presence of coliforms by the membrane filter technique using the standard test as well as the delayed incubation test.

Detection of various bacterial parameters employed in recreational waters.

Upon successful completion of this program, the trainee should be able to handle the laboratory quality control work as it relates to bacteriological drinking water standards.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

**CHEMICAL EXAMINATION OF
DRINKING WATER (141WH)**

1 week

Cincinnati, Ohio . . . April 10-14, 1972

This course is designed for those individuals responsible for the chemical examination of drinking water. The course will cover appropriate wet methods as well as some of the newer instrumental methods. Both theory and application of such analytical tools as the various types of chromatography will be discussed. Inorganic as well as organic pollutants will be considered.

The student will become acquainted with the newer techniques and be able to better use the more routine methods of analysis.

Topic areas include:

Determination of fluoride by electrodes

Use of gas and thin-layer chromatography

Amperometric titrations

Atomic absorption

UV-visible spectrophotometry

Routine wet methods of analysis

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

FLUORIDE DETERMINATIONS IN WATER (142WH)

3 days

Cincinnati, Ohio . January 11–13, 1972
March 14–16, 1972

Field Dates and locations to be negotiated by the requesting agency through the Regional Representative, Division of Water Hygiene, WQO, of the appropriate EPA Regional Office.

This course is designed to provide water fluoride analysis training for individuals directly involved in performing fluoride determinations on drinking waters. The fluoridation of public water supplies requires close control of dosage rates for optimum dental health benefits. Accurate analytical determinations of fluoride levels in the water are essential to control the dosage rates.

This is primarily a laboratory course developed to provide training in the three standard methods for fluoride determinations as appearing in the 13th Edition of Standards Methods — the Alizarin Visual (Scott-Sanchis), Spadns, and Electrode methods. Individuals applying for the course need no previous experience in fluoride analytical techniques nor require any special laboratory skills.

Subjects covered in the course include:

Public Health Aspects of Water Fluoridation
Engineering Aspects of Water Fluoridation
Safety and Hazards in Handling Fluorides
Calculation of Fluoride Feed Rates
Fluoride Determinations in Water

1. Chemistry of Fluoride Analysis
2. Analytical Procedures
3. Use of Instruments
4. Control of Interfering Ions

Laboratory Session I

Determination of Fluoride in Water

Laboratory Session II

Removal of Interferences

Laboratory Session III

1. Determination of Fluoride in the Presence of Interferences
2. Fluoride Analytical Procedures — Electrode Method

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

OPERATION AND CONTROL OF WATER SYSTEMS SUPPLIED FROM WELLS (157WH)

1 week

Cincinnati, Ohio . . March 27–31, 1972

Field Dates and locations to be negotiated by the requesting agency through the Regional Representative, Division of Water Hygiene, WQO, of the appropriate EPA Regional Office.

This course is intended for operators of water systems depending exclusively on wells for supply, and for those officials of state and local regulatory bodies who wish to promote sound operation and control in such systems. Development of this relatively new training effort comes in response to a serious need discovered in the Community Water Supply Survey carried out by the Water Hygiene Division in 1969.

Emphasis is on practical rather than technical approaches, although some technology is presented in order to clarify the need for controlled operations. Some subjects include:

Local geology and hydrology as they affect well and aquifer performance.

Basic principles of well and aquifer behavior when pumped.

Elements of good well design and construction.

Economic and sanitary benefits from proper well design, construction, and operation.

Value of well and performance monitoring and data recording.

Installation and maintenance of well monitoring equipment.

Well and pump testing for performance.

Interpretation of data from records and tests.

Water well maintenance and rehabilitation.

Water well pump and control maintenance.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

**WATER SUPPLY SANITARY
SURVEY (160WH)**

1 week

Cincinnati, Ohio . December 6-10, 1971

The course is designed for training state and federal engineers who are responsible for conducting sanitary surveys and evaluating interstate carrier water supply systems.

Lectures, demonstrations, and field studies are used to instruct the trainees in the methods for performing the survey and making the evaluation as prescribed by the Advisory Committee on Use of the Public Health Service Drinking Water Standards. The evaluation appraises the origin, treatment, distribution, and storage of the water, and the bacteriological, physical, chemical, and radio-chemical qualities of the water as it flows from the consumers tap.

Recommended sanitary requirements will be discussed as they relate to each of the water system elements listed above and to the water quality.

This will include detailed consideration of requirements for:

Source protection for both ground water and surface water supplies.

Treatment requirements as determined by source of water.

In-plant procedures including operation controls (supervision and laboratory tests) records, safety, etc.

Programs related to distribution systems for cross connection control, storage tank and reservoir protection, and bacteriological sampling.

The student, upon completion of this course, will have improved comprehension of the program and the health implications, and be able to more readily detect situations in a water system that would indicate current or potential hazard to the drinking water quality.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

**UNIT PROCESSES – WATER TREATMENT
PLANT OPERATION (158WH)**

1 week

Cincinnati, Ohio . January 17–21, 1972

This course is designed for state, municipal, and federal engineers and water plant operators responsible for the operation and maintenance of treatment facilities.

Classroom and field instruction will be given on the theory and practice of operation of modern high rate filtration units. Laboratory demonstrations will be used to portray the value and application of control tests. Successful operation of filtration plants is dependent upon the complete understanding by the operation staff of the pretreatment operations leading to filtration, and the maintenance of these units.

Principles that will be discussed are to include:

Raw water storage reservoirs

Coagulation and flocculation

Selection and maintenance of filter media

Filter inspection

Disinfection and fluoridation

Continuous filter monitoring

Emergency procedure considerations

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

GROUND WATER TECHNOLOGY (161WH)

1 week

Cincinnati, Ohio September 27–October 1, 1971

Field Dates and locations to be negotiated with requesting agency through the Regional Representative, Division of Water Hygiene, WQO, of the appropriate EPA Regional Office.

This course is offered for engineers, sanitarians and other professionals having administrative review and surveillance responsibilities for public water supplies served by water wells. It is intended to satisfy the needs of personnel working at Federal, state, and local levels.

The course concentrates on the practical engineering considerations associated with the construction, operation, and maintenance of water wells.

Specific topics include:

Occurrence and movement of ground water

Kinds of aquifers

Behavior of different kinds of wells and aquifers when pumped

Water well efficiency and what it means to the utility

Principal well construction methods; their relative advantages and disadvantages

Basic considerations in modern water well design

Practical aspects of aquifer and well hydraulics

Well development — why and how it's done

Well and aquifer testing and its practical application

Water well performance monitoring and records

Incrustation and corrosion

Water well rehabilitation

Trainees participate in the solution of well and aquifer hydraulics and well design problems under the direction of experts in the subjects. Depending on timing and travel requirements, one or more field visits to drilling or testing operations may be made.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

SPECIAL ANALYTICAL TECHNIQUES IN ENVIRONMENTAL MEDIA-GAS CHROMATOGRAPHY (710WH)

1 week

Cincinnati, Ohio . October 11–15, 1971

This course is designed for technically trained personnel in control and regulatory laboratories concerned with problems associated with water hygiene.

The lectures are devoted to the principles of gas chromatography while laboratory exercises are designed to enable the trainee to gain knowledge in the application of the above technique to water analysis.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

**SPECIAL ANALYTICAL TECHNIQUES IN
ENVIRONMENTAL MEDIA-THIN-LAYER
CHROMATOGRAPHY (711WH)**

3 days

Cincinnati, Ohio February 14—16, 1972

This course is designed for technically trained personnel in control and regulatory laboratories concerned with problems associated with water hygiene.

The lectures are devoted to the principles of thin-layer chromatography while laboratory exercises are designed to enable the trainee to gain knowledge in the application of the above technique to water analysis.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

**SPECIAL ANALYTICAL TECHNIQUES IN
ENVIRONMENTAL MEDIA-ATOMIC
ABSORPTION (712WH)**

3 days

Cincinnati, Ohio June 5—7, 1972

This course is designed for technically trained personnel in control and regulatory laboratories concerned with problems associated with water hygiene.

The lectures are devoted to the principles of atomic absorption while laboratory exercises are designed to enable the trainee to gain knowledge in the application of the above technique to water analysis.

To expedite enrollment in this course, application forms should be mailed to:

Training Officer
Water Hygiene Division, WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

LOCATIONS OF TRAINING FACILITIES

WATER QUALITY OFFICE

ENVIRONMENTAL PROTECTION AGENCY



INFORMATION FOR APPLICANTS

Through the Division of Manpower and Training and the Water Hygiene Division, the Water Quality Office of the Environmental Protection Agency conducts programs of research, technical assistance, enforcement, and training for water pollution control, and water supply programs.

Training by the Division of Manpower and Training is offered at five locations in the United States. These locations are the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio; the Robert S. Kerr Water Research Center in Ada, Oklahoma; the Southeast Water Laboratory in Athens, Georgia; the Pacific Northwest Water Laboratory in Corvallis, Oregon; and the Edison Water Quality Laboratory in Edison, New Jersey. The Water Hygiene Division offers a program of training related to the treatment and distribution of public water supplies, at Cincinnati, Ohio.

ADMISSION TO COURSES

Admission to courses is based on submission of application forms (using a separate form for each course) provided at the back of this bulletin. Where appropriate, please be sure to secure the signature of approval from the appropriate supervisor in your administrative chain of command. Mail the application to the Environmental Protection Agency training facility offering the course you wish to attend. Additional forms may be obtained from any training unit of the Environmental Protection Agency listing courses in this Bulletin.

NO TUITION OR REGISTRATION FEE IS CHARGED. Early application is advised, since course enrollments are limited. Factors considered in accepting students for admission include priority of application, qualifications of the applicant, and the need for training, based on review of the applicant's duties and responsibilities in relation to the course content and objectives. Students arrange for their own housing and transportation while attending courses.

NOTIFICATION OF ENROLLMENT

Four to six weeks prior to course date, information on local transportation and housing will be mailed to applicants accepted for enrollment. At this time, information will be provided with respect to the day and hour of course opening and closing, and other matters of special interest. Please arrange travel plans to conform to the announced course schedule.

APPLICATIONS FOR ADMISSION TO TRAINING COURSES



ENVIRONMENTAL PROTECTION AGENCY

Form Approved
Budget Bureau
No. 42-R1506

Water Quality Office
Education and Training Programs

APPLICATION FOR ENROLLMENT

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss

[first]

[middle initial]

[last]

II. COURSE DESIRED:

Title _____ Course No. _____

Location of Course _____ Dates _____

Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT(If different from above):

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

Total years experience in profession _____

**VI. PREVIOUS FEDERALLY SPONSORED WATER QUALITY COURSES
ATTENDED:**

Titles

Dates

Location

VII. EDUCATION

High School Graduate : Yes____ No____ or GED. (General Educational Development)____

Number of years education completed beyond high school _____

Institution

Date attended

Major Area
of Study

Degree or
Certificate

VIII. SIGNATURES:

Signature of Approving Officer
(Required for WQO personnel;
optional for other agencies)

Signature of Applicant

Title

Date

**MAIL TO THE WATER QUALITY OFFICE CONDUCTING
THE TRAINING COURSE:**

Manpower and Training Program
Robert S. Kerr Water Research Center
WQO, EPA
P.O. Box 1198
Ada, Oklahoma 74820

National Training Center
WQO, EPA
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training and Manpower Development
Southeast Water Laboratory
WQO, EPA
College Station Road
Athens, Georgia 30601

Water Hygiene Division
WQO, EPA
5555 Ridge Avenue
Cincinnati, Ohio 45213

Manpower and Training Program
Pacific Northwest Water Laboratory
WQO, EPA
200 S. 35th Street
Corvallis, Oregon 97330

Edison Water Quality Laboratory
WQO, EPA
Edison, New Jersey 08817

CHRONOLOGICAL SCHEDULE OF COURSES

Water Quality Office, EPA

July 1971 – June 1972

Sewage Treatment Facilities for Federal Installations (177), Cincinnati, Ohio July 12–16, 1971
Water Quality Studies (161), Corvallis, Oregon July 12–23, 1971
Planning, Development and Management of Wastewater Treatment Facilities (175)
Cincinnati, Ohio July 19–23, 1971

Orientation to Wastewater Treatment Operation (173) Cincinnati, Ohio August 2–6, 1971
Operator Instructor Development (180), Cincinnati, Ohio August 9–13, 1971
Water Quality Studies (161), Corvallis, Oregon August 9–20, 1971
(Alaska)

Chemical Analyses for Water Quality (100), Cincinnati, Ohio August 16–27, 1971

Operator Instructor Development (180), Ada, Oklahoma September 13–17, 1971
Water Quality Studies (161), Cincinnati, Ohio September 13–24, 1971
Ground Water Technology (161WH), Cincinnati, Ohio September 27–October 1, 1971
Biological Treatment Technology (162), Cincinnati, Ohio September 27–October 8, 1971

Sewage Treatment Facilities for Federal Installations (177), Corvallis, Oregon October 4–8, 1971
Special Analytical Techniques—Gas Chromatography (710WH), Cincinnati, Ohio October 11–15, 1971
Control of Oil and Other Hazardous Materials (165), Edison, New Jersey October 13–15, 1971
Advances in Treatment of Domestic Wastes (172.2), Athens, Georgia October 18–22, 1971
Field and Laboratory Activities in Water Quality Surveys (161.1), Ada, Oklahoma October 18–22, 1971

Analytical Quality Control (151), Cincinnati, Ohio November 1–5, 1971
Fish Kill Investigation Technology (143), Ada, Oklahoma November 2–4, 1971
Pesticide Residue Analysis in Water (103.1), Athens, Georgia November 8–12, 1971
Sewage Treatment Facilities for Federal Installations (177),
Corvallis, Oregon November 8–12, 1971
Bioassay in Pollution Analysis and Control (149), Cincinnati, Ohio November 8–12, 1971

Water Supply Sanitary Survey (160WH), Cincinnati, Ohio December 6–10, 1971
Pesticide Residue Analysis in Water (103.2), Athens, Georgia December 6–10, 1971
Use of Photogrammetric Techniques for Water Pollution Control (110),
Corvallis, Oregon December 6–10, 1971
Current Practices in Water Microbiology (120), Edison, New Jersey December 6–17, 1971
Analysis and Control of Thermal Pollution (178), Cincinnati, Ohio December 13–16, 1971

Physical-Chemical Treatment Technology (172.1), Cincinnati, Ohio January 10–14, 1972
Fluoride Determinations in Water (142WH), Cincinnati, Ohio January 11–13, 1972
Advances in Treatment of Domestic Wastes (172.2), Cincinnati, Ohio January 17–21, 1972
Planning and Administrative Concepts of Water Quality Surveys (161.2),
Ada, Oklahoma January 17–21, 1972
Laboratory Analyses in Treatment Plant Operations (105.1),
Edison, New Jersey January 17–21, 1972
Unit Processes — Water Treatment Plant Operation (158WH),
Cincinnati, Ohio January 17–21, 1972
Basic Environmental Statistics (801), Cincinnati, Ohio January 24–28, 1972
Current Practices in Water Microbiology (120),
Cincinnati, Ohio January 31–February 11, 1972
Chemical Analyses for Water Quality (100), Corvallis, Oregon January 31–February 11, 1972

Special Analytical Techniques — Thin Layer Chromatography (711WH),
Cincinnati, Ohio February 14–16, 1972

Physical-Chemical Treatment Technology (172.1), Athens, Georgia February 14—18, 1972
 Chemical Analyses for Water Quality (100), Cincinnati, Ohio February 28—March 10, 1972

Geohydrologic Relationships in Water Pollution (168), Ada, Oklahoma March 6—9, 1972
 Basic Environmental Statistics (801), Edison, New Jersey March 6—10, 1972
 Analysis and Control of Thermal Pollution (178), Athens, Georgia March 13—16, 1972
 Fluoride Determinations in Water (142WH), Cincinnati, Ohio March 14—16, 1972
 Operation and Control of Water Systems Supplied from Wells (157WH),
 Cincinnati, Ohio March 27—31, 1972

Environmental Statistics—Sample Size Determination (815), Cincinnati, Ohio April 3—7, 1972
 Orientation to Wastewater Treatment Operation (173), Corvallis, Oregon April 3—7, 1972
 Chemical Examination of Drinking Water (141WH), Cincinnati, Ohio April 10—14, 1972
 Control of Oil and Other Hazardous Materials (165), Athens, Georgia April 11—13, 1972
 Instrumental Analysis of Chemical Pollutants in the Aquatic Environment (107),
 Cincinnati, Ohio April 17—28, 1972
 Characterization of the Fecal Streptococci (122), Edison, New Jersey April 24—28, 1972

Field and Laboratory Activities in Water Quality Surveys (161.1), Ada, Oklahoma May 1—5, 1972
 Field and Laboratory Activities in Water Quality Surveys (161.1), Athens, Georgia May 8—12, 1972
 Bacteriological Examination of Drinking Water (140WH), Cincinnati, Ohio May 8—12, 1972
 Industrial Liquid Waste Surveys (161.4), Edison, New Jersey May 15—19, 1972
 Performance Evaluation of Wastewater Treatment Facilities (179), Cincinnati, Ohio May 22—26, 1972

Special Analytical Techniques — Atomic Absorption (712WH), Cincinnati, Ohio June 5—7, 1972
 Freshwater Biology and Pollution Ecology (140), Cincinnati, Ohio June 5—16, 1972
 Water Quality Studies (161), Corvallis, Oregon June 19—30, 1972