NEWS
WATER RESOURCES RESEARCH INSTITUTE
OF THE UNIVERSITY OF NORTH CAROLINA

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CONTENTS

STATE SCENIC RIVER DEDICATED

The South Fork New River, in Ashe and Alleghany Counties, North Carolina, was dedicated as part of the State's Natural and Scenic River System in May. Governor James Hunt and Secretary of Natural Resources and

Community Development Howard Lee observed the Governor's Cup Canoe Race prior to the dedication ceremonies. Many North Carolinians enjoyed the celebration activities. They marked a victory for many individuals who sought for 14 years to save the ancient New River from being dammed by the Appalachian Power Company (APCO).

The controversy began in 1962 when APCO applied to the Federal Power Commission for a permit to study the river as a site for a hydro-electric project. The New River is the second oldest river system in the world, after the Nile, and it predates the Appalachian Mountains. The river flows north and its headwaters are in North Carolina. Dedicated to the ideal of preserving the river in its natural state, thousands of citizens from all over the country fought in court and in Congress to prohibit construction of the project. The struggle ended successfully when a bill by North Carolina Congressional Representative Stephen L. Neal to designate the New River as a National Scenic River was passed in 1976.

Since that time, the North Carolina Department of Natural Resources and Community Development has worked to provide hiking and canoeing trails, bridle paths and primitive camp sites along 26.5 miles of the river. It is now available for the public's enjoyment. *(Photo by D. H. Howells)*

SEDIMENTATION CONTROL COMMISSION CONCERNED WITH EROSION AT MAJOR HIGHWAY PROJECTS

The North Carolina Sedimentation Control Commission in its May 22 meeting expressed extreme concern about the amount of soil erosion and sedimentation observed in a field visit in the Greensboro area. The project of greatest concern was US 220 south of Greensboro. ~~Another~~, NC 66 west of Greensboro also had erosion problems. The Commission Chairman Joe Phillips indicated that numerous inspections by Regional Engineers in the Land Quality Section had revealed violations of the Sedimentation Pollution Control Act. These violations had been reported to construction personnel and to Division Engineers with the North Carolina Department of Transportation but were not corrected.

Dr. Phillips further indicated that the US 220 project and NC 66 highway projects reflect an inconsistency in handling of sediment control efforts across the state. Chairman Phillips stated that "this Commission's top priority is government construction projects and road construction is still, in spite of the commendable progress made, the leading contributor of construction-related sediment pollution."

NUTRIENTS IN SOUND LINKED TO FISH DISEASE

A Wake Forest University biologist has said that unless pollution of the Albemarle Sound and its tributaries is curbed, the functional life expectancy of the Sound as a finite resource "can be measured in terms of our lifetime."

According to Dr. Gerald W. Esch, pollutants are entering the Sound from a variety of sources. Discharges from industries and municipalities and runoff from farms all enter and accumulate in the rivers that empty into the Sound. No single source is responsible for the pollution. So any attempt to correct the problem will require cooperation by a number of individuals, including local and state officials, Esch said.

Esch and Dr. Terry Hazen examined water quality conditions in the Albemarle Sound as part of their recently completed research on red-sore disease in fish, a relatively recent but serious and increasingly widespread problem in the southeastern states.

They found that high levels of nutrients, which are known to cause nuisance algae blooms and low levels of oxygen in the water, also contribute to conditions associated with outbreaks of red-sore disease, such as stress in the fish and high densities of the bacterium that is the causative agent for the disease. And unless action is taken soon to control nutrient inputs to the Sound and its tributaries, Esch said, "we will have more red-sore disease, more blue-green algae blooms, more terrible odors, less efficient and more costly commercial fishing and even worse sports fishing."

The three-year study of the causes of red-sore disease was funded by The University of North Carolina Water Resources Research Institute. During the last ten years, the disease has posed an increasing threat to both game and commercial species of fish in North Carolina and other southeastern states.

An outbreak of the disease in Albemarle Sound in 1976 killed approximately 95 percent of the white perch population. And 50 percent of the commercial catch of all fish species had to be discarded because of the unsightly red sores.

Red-sore disease produces purulent and hemorrhagic surface lesions in fish, frequently followed by death, according to Esch.

"The scales erode. They actually fall off, and the tissues underneath erode," he said. "Ultimately, unless the fish recovers, the bacterial organisms are picked up in the bloodstream and damage the kidneys and liver."

The disease does not discriminate with respect to fish, Esch said. "It will attack virtually anything, with some exceptions." An outbreak in Florida was even reported to have killed several species of reptiles, including snakes, turtles and alligators.

The study was aimed at determining what water quality characteristics lead to outbreaks of red-sore disease. Esch and Hazen found that a number of factors are related to the disease, the most apparent being high levels of phosphate and total phosphorous. These nutrients promote the disease in two ways. High levels of nutrients help promote high densities of the A. hydrophila bacterium, which is the causative agent of red-sore disease. They also promote conditions that cause stress, or a lowered body condition, in fish, making them more susceptible to the disease.

Although further study is needed, Esch said, the best approach for controlling red-sore disease as well as other problems such as nuisance algae blooms would be to reduce nutrient input to the Albemarle Sound and its tributaries.

Copies of the research report are available free to residents of North Carolina (eight dollars out of state) from The Water Resources Research Institute, 124 Riddick, North Carolina State University, Raleigh, NC 27650.

NRCD ADOPTS RULES FOR OIL REFINERY PERMITS

The N. C. Department of Natural Resources and Community Development (NRCD) has adopted rules which establish procedures and standards for issuing or denying permits for construction and operation of oil refineries in the state. The regulations were effective June 16, 1980. The Oil Pollution and Hazardous Substances Control Act authorizes adoption of the refinery permit regulations, which apply to existing and proposed refineries.

The refinery permit law requires that the decision to issue or deny a permit be based on an assessment of the effects which the refinery would have on wildlife, fisheries, air and water quality, and publicly owned lands. The new rules state that secondary effects on public health, safety and welfare resulting from the refinery's primary impacts on wildlife, fisheries, air, water and public land will be considered in the permit decision. The permit application must contain information on the applicants's experience in building and operating refineries, details of operation and proposals for preventing, containing and cleaning up any spills that may occur.

A series of public hearings on the permit regulations were held beginning in April 1979. Governor Hunt and NRCD Secretary Howard N. Lee have stated their intent to protect North Carolina's environment. At the time of adoption, Lee stated: "We have formulated these rules to provide a full and fair discussion and assessment of the effects of a refinery on our natrual resources."

Currently, North Carolina has one small refinery in New Hanover County. Two more are proposed, one on the Cape Fear River near Wilmington and another near Morehead City.

CLEMSON STUDY EVALUATED WASTEWATER APPLIED TO FOREST

Results of a two-year Clemson University Study shows positive benefits associated with applying municipal sewage effluent to hardwood coppice and pine forests. The study used effluent from the Town of Clemson, South Carolina. Using various rates the research showed increased biomass production in the hardwood areas and increased height of pines with each increase in the application of effluent. The researchers indicated that the nutrient values of the effluent were not very high and the greatest influence on the vegetation may have come from the water applied rather than from the added nutrients.

Soil analysis for fecal coliforms showed that by the time the effluent reached a depth of 45cm, they had been effectively removed. There was no evidence of any groundwater or adjacent stream contamination at the rates applied.

Results of the study appear in Report No. 85 titled, "Municipal Sewage Effluent Application to Soils Bearing Hardwood Coppice and Loblolly Pine Stands," published by the Water Resources Research Institute, Clemson University, Clemson, South Carolina 29631.

NEW UNC REPORT AVAILABLE ON MANAGING FLOOD AREAS

Three interim reports are available which summarize selected findings of a national study of flood plain land use management. The study is by investigators at the Center for Urban and Regional Studies at UNC-Chapel Hill.

Flooding is a natural phenomenon that helps create and sustain our biological life support system, the authors note, yet it can become a problem when man competes with rivers and streams for the same space. Flooding causes $1.5 to $2 billion in public and private property damages each year.

Recent efforts to reduce flooding problems exphasize nonstructural controls. One of the principal components of the nonstructural approach is land use management of flood hazard areas, the subject of the national study.

The interim reports are:

Managing Flood Hazard Areas: The State of Practice, by Steven P. French and Raymond J. Burby

Managing Flood Hazard Areas: A Conceptual Framework for Evaluating Program Effectiveness, by Raymond J. Burby, Steven P. French and Edward J. Kaiser

Managing Flood Hazard Areas: A Field Evaluation of Local Experience, by Steven P. French, Todd L. Miller, Raymond J. Burby and David H. Moreau.

Burby is the project's principal investigator, and French is deputy project director. A final report on the study which was sponsored by the National Science Foundation, will be published in the fall of 1980.

Information regarding the availability of these reports can be obtained from Dr. Raymond J. Burby, Center for Urban and Regional Studies, University of North Carolina, Hickerson House 067A, Chapel Hill, NC 27514.

PAMPHLET AVAILABLE ON FLOODS, DROUGHTS

The Institute is reissuing a pamphlet entitled "Floods and Droughts: The Worst are yet to be."

The 21-page pamphlet, written by Ralph C. Heath of the US Geological Survey, contains information on these two phenomena as they affect North Carolina and explains why their worst extremes are yet to come. Heath suggests measures that might be taken to keep flood losses to a minimum and to meet future water needs.

Heath notes, "Much of the recent development in North Carolina has not involved detailed consideration of floods and droughts...One of the most important concerns both of water management and of long-range planning is to prepare for the extremes of hydrology. The key to success is to recognize that the worst extremes are yet to be."

The pamphlets are available free of charge from the Institute.

GEOLOGICAL SURVEY REPORTS ON PRINCIPLES OF GROUND WATER RELATED TO NORTH CAROLINA

The US Geological Survey, Department of the Interior, has just released an experimental report structured around a rather unique "building block" concept. Acording to Ralph C. Heath, author of the report and Chief of the Survey's Water Resources Division operations in North Carolina, the experimental report is like any other in that it is organized into sections which relate logically to one another, but it differs from other technical reports in that individual sections consist of essays that can stand independently of those that come before or after.

"The format," said Heath, "has great advantages over conventionally structured reports for certain situations. This particular report titled "Basic elements of ground-water hydrology with reference to conditions in North Carolina," is a training manual designed for use in workshops for water managers, planners, water-plant operators, consultants, and others concerned with development and conservation of the State's ground-water resources. An earlier version on the report has already been tested in several workshops across the State. Some workshops were attended exclusively by water-plant operators, others were attended by State water-pollution control personnel, and future workshops are planned exclusively for consultants and others for well drillers. With this "building block" structure it has proven easy to tailor-make the training manual to suit the different needs of different audiences--merely by selecting and arranging essays that deal with topics of interest to the audience.

"The trick in preparing these essays," said Heath, "is to deal with only one or two fundamental concepts at a time, keep the discussion simple, and limit discussion to only one or two-pages for each essay."

Heath is working with other members of the Water Resources Division to develop more effective ways to communicate the results of the Survey's earth-resources investigations, and this new report format is only one of the methods being explored to improve communications with the public. In the past, the Survey aimed its report products mainly at highly technical audiences, but, as the Survey's Director H. William Menard recently noted ".....requests by policy makers for information are continuous, and the challenge is to communicate our findings to them in forms that are understandable to intelligent but very busy nonprofessionals so that their decisions are soundly based on a correct appreciation of the physical facts."

Copies of the report may be obtained from the US Geological Survey, P. O. Box 2857, Raleigh, North Carolina 27602, until the stock available for free distribution is exhausted. Thereafter, copies of the report, which is designated Open-File Report 80-44, can be purchased from the Open-File Section, Branch of Distribution, US Geological Survey, Box 25425, Federal Center, Denver, Colorado 80225.

ED HOLLAND PROJECT DIRECTOR FOR TRIANGLE J WATER EFFORTS

Triangle J Council of Governments has appointed Edward A. Holland as 208 Project Director for the Areawide Water Quality Management project. Ed has been with the project since April 1978 as Water Quality Specialist. New duties as Project Director began June 1, 1980. The former Project Director, David E. Reynolds is now with the League of Municipalities in Raleigh.

Ed received his AB degree in Geological and Geophysical Sciences from Princeton University in 1971. He completed a Master of Science in Public Health in 1979 from the Department of Environmental Science and Engineering at the University of North Carolina at Chapel Hill.

NORTH CAROLINA SCIENTISTS PARTICIPATE IN INSTREAM FLOW SESSION

Dr. Miguel A. Medina, Jr., of the Duke University Department of Civil Engineering was chairman of the hydraulic/water quality simulation session at the Second Annual Ohio River Basin Commission Instream Flow Seminar/Workshop held May 12-13 in Fort Mitchell, Kentucky.

Medina spoke on hydrologic and water quality modeling. He presented a methodology to account for water quality fluctuations into instream flow strategies. He also introduced the concept of long-term, continuous simulations to derive cumulative frequency and duration curves of flow and relevant water quality parameters. A future application to the Yadkin-Pee Dee River was discussed.

The methodology presented by Medina was the only one to address water quality problems quantitatively. He noted that the seminar was timely in that the current research and state-of-the-art reviews will be beneficial to the Yadkin-Pee Dee Study.

Bill Bland of the North Carolina Department of Natural Resources and Community Development described a four-month study of the Eno River. Bland's presentation was part of the seminar's session on instream flow experiences. Planned withdrawals by the City of Durham to supplement their water supplies during low flows prompted the State to establish minimum instream flow needs. Recommendations made to the City of Durham were: 30 cfs should be maintained during March, April and May (spawning season) and 10 cfs the rest of the year.

POSITIONS AVAILABLE

Environmental Engineer I. Duties include the management of Phase I inspection of certain high hazard dams in North Carolina, coordination of efforts for Corps of Engineers and Land Quality Staff and its job contractors, and technical development and review of inspection reports. B.S. in Civil Engineering required. No experience required; however, would prefer one-year experience. Rate of pay is $16,188 annually. For Further information contact: Charles H. Gardner or William P. Weldon, Land Quality Section, Division of Land Resources, N. C. Department of Natural Resources and Community Development, P. O. Box 27687, Raleigh, NC 27611. Telephone--919:733-4574.

CONFERENCES AND WORKSHOPS

U. S. Forestry and Water Quality: "What Course in the 80s? An Analysis of Environmental and Economic Issues. The conference includes: Reviewing the water quality problems affected by siliviculture; determining the relative importance of those problems from the standpoint of controlling them; identifying problems about which we know too little to move ahead with regulatory action; discussing the legal and institutional factors that influence forestry management and the forest products business. The conference will be held June 19-20, 1980 at the Hyatt House, Richmond, Virginia. For details write: Water Pollution Control Federation, 2626 Pennsylvania Avenue, NW, Washington, DC 20037.

New Developments in River Basin Management. The conference will focus on new developments and practices in management and control of river basins. Professionals in river management will evaluate new policies and identify research needs.

It will be held June 29-July 3, 1980 at The Netherland Hilton Hotel, Cincinnati, Ohio. For details contact: Ohio River Valley Water Sanitation Commission, 414 Walnut Street, Suite 900, Cincinnati, Ohio 45202, USA. Telephone: (513)421-1151. Mr. Leo Weaver, Executive Director.

1980 International Symposium on Urban Storm Runoff to be held at the Lexington Technical Institute, University of Kentucky Campus, Lexington, Kentucky. The dates for this symposium are July 28-31, 1980. Symposium '80 is the seventh annual conference on subjects related to Urban Storm Runoff held at the University of Kentucky. The conference is organized to serve the purpose of gathering current information from various institutions, including universities, government agencies and practicing engineering groups, and dissemenatiing this information for the advancement of knowledge concerning these subjects and for implementation by field engineering applications.

Details are available from The University of Kentucky, College of Engineering, Office of Continuing Education, 773 Anderson Hall, Lexington, KY 40506.

National Estuary Symposium. The U.S. Fish and Wildlife Service, with the cooperation of the University of Southern Mississippi, will sponsor a "National Symposium on Freshwater Inflow to Estuaries" September 9-11, 1980 in San Antonio, Texas. The goal of the symposium is to review the management, planning, scientific and technical problems associated with freshwater inflow into estuaries and formulate recommendations. The program will analyze and present solutions to a significant coastal problem and add to the emphasis of 1980 as "The Year of the Coast." For more information write: The University of Southern Mississippi, Gulf Park Campus, Long Beach, Mississippi 39560.

International Seminar on Control of Nutrients in Municipal Wastewater Effluents. The initial design characteristics with long-term operating results and cost experience of selected factilities will be reviewed at an international seminar sponsored by the U.S. Environmental Protection Agency. The seminar is designed to disseminate practical information on full-scale municipal nutrient control experience from actual users from almost all parts of the world.

The seminar will be held in San Diego, September 9, 10, and 11 at the Hotel del Coronado. It is being arranged by the Office of Research and Development, Wastewater Research Division of the Municipal Environmental Research Laboratory and the Center for Environmental Research Information.

Further procedural information can be obtained by contacting CENTEC Corporation, which has been selected to coordinate the seminar for EPA, at the following address: Donna J. McCaughey, Seminar Coordinator, CENTEC Corporation, 11800 Sunrise Valley Drive, Reston, Virginia 22091, (703)476-4000.

For technical information, contact: E. F. Barth, Seminar Coordinator, U.S. EPA, 26 St. Clair Street, Cincinnati, Ohio 45268, (513)684-7641.

International Symposium on Inland Water and Lake Restoration. This event will be sponsored by the U.S. EPA, the Organization for Economic Cooperation and Development (OECD), the Maine Dept. of Environmental Protection, and the Center for Environmental Research Information in Portland, ME. The purpose of the program will be to provide for the exchange of scientific information on the most current lake water quality programs and worldwide investigative efforts. Presentations will be made by recognized world experts on a variety of subjects. Sessions are designed to foster discussions among water quality experts, planning personnel, regulators, lake restoration consulting engineers, and the general citizenry. This symposium is scheduled for September 8-12, 1980. For more information, contact Dr. Ann N. Ware, Project Manager, AWARE, Inc. P. O. Box 40284, Nashville, TN 37204. For information on display space, call David Dominie, Maine EPA (207/289-2591).

Quantitative Aspects of Groundwater Management. This short course is to be held July 14-18,1980 at the University of Kansas. The course is designed for Earth Scientists and Engineers who wish to improve their effectiveness in groundwater pollution and management. It will allow those who take it to update their technical skills, advance professionally, and make contact with leaders in the field.

For further information regarding this course, contact Ms. Dale Grube, K.U. Regents Center, 9900 Mission Road, Shawnee Mission, Kansas 66206. (913)341-4554.

Culverts--Hydrology and Hydraulics. This short course is being held July 23,24,25, 1980, at Lehigh University, 303 University Center, Bethlehem, Pennsylvania. It is designed for practicing engineers covering a review and/or an introduction to the fundamentals of culvert design. Both the hydrology of design discharge and the hydraulics of culvert flow will be emphasized. Case studies will be presented to highlight essential features of the design process. A laboratory model to demonstrate flow in culverts will be used. Printed course notes, references, and example problems will be distributed to all participants.

Further information may be obtained by contacting: Dr. Robert L. Johnson, (215)861-3560, Fritz Engineering Laboratory #13, Lehigh University, Bethlehem, Pa. 18015.

Water Quality Instructors' Workshop. This workshop will again be held in Cincinnati this summer from July 28 through August 1 in order to acquaint educational institutions and training agencies with the details and availability of U.S. EPA programs and resources for the training of water quality personnel.

For details write or call: Dr. Thaddeus W. Fowler, Teachers College, University of Cincinnati, Cincinnati, OH 45221, (513)475-3561.

Southern Environmental Resources Conference. This conference is scheduled for July 16-18, 1980 at the Little Rock Hilton, Little Rock, Arkansas.

Program topics for the 1980 meeting include:

- Groundwater strategy
- Public participation in environmental policy
- Recycling of environmental wastes into fuel
- A review of federal policy on the use of water from federal impoundments
- The Corps of Engineers' National Hydropower Study
- Problems related to the blocking of streams by noxious aquatic plants
- State legislation to provide for more effective regulation of water supplies
- Navigation on lesser streams
- The federal budget and environmental programs
- Hazardous waste and water pollution
- EPA's Underground Injection Control Program

For details write: Southern Environmental Resources Conference, 3384 Peachtree Road, NE, Suite 610, Atlanta, Georgia 30326.

National Conference on Environmental Engineering. This conference is being held at the Roosevelt Hotel, New York, N. Y., July 8-10, 1980. The topics outlined in this conference include: the provision of safe, palatable, ample public water supplies; the proper disposal of or recycling of wastewater and solid wastes; the adequate drainage and disposal of or recycling of urban and rural storm water runoff; the control of surface and subsurface water, soil, and air pollution; the handling and disposal of hazardous wastes; and the social and environmental impacts of technological advances in these areas as well as in related public health area concerns.

Registration information and requests should be mailed to: Continuing Education Services, ASCE, 345 East 47th Street, New York, NY 10017.

WATER RESOURCES CONDITIONS IN NORTH CAROLINA During the first half of May rainfall was light and streams receded to near or below normal flows. Heavy general rains on the 17th, 20th, 22nd, and 27th caused moderate rises on most streams thereby producing monthly mean flows which were considerably greater than long-term averages for May. Flows were generally confined within banks and only minor flooding of small, headwater streams occurred.

Ground-water levels rose slightly in the Mountains and declined elsewhere. Except in areas affected by heavy withdrawals, levels remained above long-term averages across the State.

. . . . . *U.S. Geological Survey*

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

(Residents of North Carolina may borrow these from the Institute for a two-week period. Where individual copies are desired, readers are encouraged to request copies from the organization issuing the publication. The addresses are provided by the News for this purpose.)

WATER RESOURCES PLANNING

"Surcharge of Sewer Systems," (#149), 3/80, by B. Yen, et al, U. of IL, 2535 Hydrosystems Lab., Urbana, IL 61801. (06C)

"Water-Management Planning for Illinois Communities," (#9), 7/79, by A. Weeks, from U. of IL, 2535 Hydrosystem Lab., Urbana, IL 61801 (06A)

"Estimating Water Treatment Costs," (Vol. I Summary) (EPA-600/2-79-162a), 8/79, by R. C. Gumerman, et al, avail. from NTIS, Springfield, VA 22161. (EPA)

"Intergovernmental Aspects of Water Transfer in Identification and Assessment of Federal and Interstate Issues and Constraints," 1980, by J. W. Westphal, et al, WRRI, OK St. U., Stillwater, OK 44074. (06E)

WATER QUALITY MANAGEMENT

"Determinants of Water Quality in Agricultural Watersheds," (#147), 1/80, by I. Y. Schlosser, et al, WRC, U of IL, 2535 Hydrosystems Lab., Urbana, IL 61801. (05B)

"Life Cycle, Ecology, and Management Considerations of the Green Filamentous Alga, *Pithophora*," (#130), 4/80, by C. A. Lembi, et al, WRRC, Purdue U., W. Lafayette, IN 47904. (05C)

"Polymers for Removal of Heavy-Metal Pollutants from Water," (#13), 1980, by A. Winston, et al, WRI, WVU, 204 Knapp Hall, Morgantown, WV 26506. (05D)

"Study of Federal and State Legislation Concerning the Construction of Proposed Oil Refineries," (80-2), 1980, by C. Grant, et al, avail. from UNC Sea Grant College Program, 105 1911 Bldg., NCSU, Raleigh, NC 27650, Price: $1. (W&E)

"Thermal Effects on Primary Productivity of Phytoplankton, Periphyton and Macrophytes in Lake Keowee, SC, (#81), 1/80, by C. R. Dillon, et al, WRRI, Clemson U., Clemson, SC 29631. (05C)

"Individual Wastewater Project--Final Report," 2/80, by Triangle J Council of Governments, et al, P. O. Box 12276, RTP, NC 27709.

WATER QUANTITY MANAGEMENT

"Papers in Hydrology," (U.S. National Report), 1975-1978, avail. from International Union of Geodesy and Geophysics, Canberra, Austalia. (02E)

"Description and Validation of the CTH-Urban Runoff Model," (#A:5), 1980, by V. Arnell, avail. from Dept. of Hydraulics, Chalmers U. of Technology, S-412 96 Goteborg, Sweden. (04A)

SPECIAL

Water Resources Programs Within the N. C. Department of Human Resources

by

James F. Stamey, Assistant Chief
Environmental Health Section
Division of Health Services
N. C. Department of Human Resources

The Environmental Health Section, formerly the Sanitary Engineering Section, of the Division of Health Services, Department of Human Resources was formed under the reorganization of state government in 1971. Prior to that it was called the Sanitary Engineering Division of the State Board of Health. The principal program areas of the Environmental Health Section include public water supply protection, on-site sewage disposal, solid waste management, hazardous waste management, milk and other food sanitation, shellfish sanitation, mosquito control and bedding sanitation. Water management is an obvious portion of some of these programs.

Water System Construction Grants

As part of the water supply program the Section administers the State's water system construction grants program. Under this program, construction grants are available to local government for up to 25% of construction costs for public water system facilities.

The 1971 Clean Water Bond Act provided $70 million for water supply. The county allocation was $50 million, for the use of local governments within the counties on a population basis. The remaining $20 million was the statewide allocation. Under the 1977 Clean Water Bond Act, $110 million was available for water supply. Of this, $79 million was allocated to counties and $31 million was allocated statewide.

To date, $53,339,962 have been committed. More than 900 applications have been processed and 712 grants awarded. The total estimated cost of the water supply systems constructed with the help of grant funds is $660,000,000. Approximately 19.3% of this was from the Clean Water Bond Act funds and the remainder from federal and local sources.

January 1, 1980 was the mid-point in the second five-year grant program. Since then, the Division has changed the regulations to provide for quarterly processing of grants. Currently, 40 county allocations have been exhausted of funds.

Public Water Supply Protection

North Carolina operated for several years under an agreement with EPA to assist them with implementation of the federal Safe Drinking Water Act. However, in 1979 when that alternative was no longer available, the N. C. Drinking Water Act was passed by the Legislature.

In September 1979 the state applied for primary enforcement responsibility. The application for "primacy" was approved in March 1980.

The Environmental Health Section is now developing the necessary management tools to regulate approximately 13,000 public water systems in the state. This process has met some difficult obstacles which include:

- improving the data processing system
- correcting the inventory of public water supplies
- implementing the non-community system program, and
- assuring that adequate laboratory facilities are available to handle the required analytical work

Because the Federal Safe Drinking Water Act requires states with primacy to have statutes and regulations at least as stringent as the federal law and EPA's regulations, the requirements will vary only slightly regardless of who has primacy. For example, the water quality criteria, expressed as the maximum contaminant levels for the state, are as stringent as EPA's. The new state and federal trihalomethane (THM) regulations have the same effective date. The federally set maximum contaminant level (MCL) for total THM is 100 micrograms per liter of water. Monitoring of systems serving 75,000 or more people must begin by November 29, 1980, and these systems must meet the MCL by November 29, 1981. Quarterly sampling is required. The effective dates are two years later for water systems serving between 10,000 and 75,000 people.

State/EPA Agreement

The Governor's office, Department of Human Resources (DHR) and the Department of Natural Resources and Community Development (NRCD) are developing a State/EPA Agreement for FY-81 with that agency. The programs for which EPA gives DHR and NRCD operating grants will be included. Four federal acts are involved; the Clean Water Act, the Clean Air Act, the Safe Drinking Water Act and the Resource Conservation and Recovery Act (RCRA).

EPA developed the concept of joint state agreements to achieve better coordination and cooperation with respect to grant programs in the health and environmental areas. In addition to work plans covering the necessary statutory elements to each Act, the Agreement will highlight issues of concern to both DHR and NRCD, and issues that may not be addressed clearly by any of the acts.

The following is a draft list, based on public input, of the issues to be included in the FY-81 Agreement:

- Protection of Coastal and Estuarine Water
  - barrier islands
  - shellfish waters
  - eutrophication
- Hazardous Waste Management
  - disposal siting
  - RCRA interim authorization
  - old site survey coordination
- Permit Program Management
  - pre-treatment
  - new source review coordination
  - prevention of significant deterioration (PSD) increment tracking
  - bubble policy
- Joint Program Management
  - EPA overview policy
  - EPA liaison function
  - reporting efficiency
  - interstate issue resolution
- Emergency Response
  - 311 program (with toxics)
  - radiation
- Statewide monitoring
- Public Water Supply Program Implementation
  - enforcement strategy
  - THM regulation implementation
  - non-community system compliance
- Integrated Groundwater Management Program
- Solid Waste Management Program
  - solid waste facility siting
  - resource recovery
- Public Participation
- Management Issues
  - equal opportunity concerns
  - staffing and organizations
  - laboratory capability
    - quality assurance
    - laboratory equipment
    - toxics data system

SOLID AND HAZARDOUS WASTE MANAGEMENT

North Carolina industries generate an estimated 100 million gallons of hazardous waste annually. The Federal law authorizing EPA to regulate hazardous waste is the Resource Conservation and Recovery Act. It provides for:

- Identification of hazardous wastes

- Standards for generators, transporters and disposal operations
- Performance, design and operating requirements for facilities to store, treat or dispose of hazardous waste
- A permit system for disposal facilities
- A national manifest system to track hazardous waste from generation to disposal
- Guidelines for states to obtain primary enforcement
- Grants for state programs

North Carolina has a hazardous waste act with requirements similar to those of the Federal Act. It requires the State regulations to be no more stringent than the Federal regulations. The Federal Act requires State regulations to be no less stringent.

Hazardous waste is that which, because of its qualities, concentration, physical, chemical or infectious characteristics, may cause death or serious illness or is potentially hazardous to health or the environment, including the water environment. The definition includes substances which are corrosive, flammable, reactive, infectious, and toxic. Radioactive wastes are not included.

The law prohibits depositing placing, dumping, discharging, spilling, releasing, burning, incinerating, or otherwise disposing of hazardous waste on land or into the water except in compliance with the laws and regulations.

Regulations for establishment of hazardous waste facilities became effective in April. By May 15, 1980, 8,000 industries will have received questionnaries asking if they generate hazardous wastes. They must respond within 90 days. Regulations implementing the national manifest system will be effective October 1, 1980.

The location of a suitable hazardous waste disposal facility is a major problem for North Carolina, as well as many other states. In the Southeast, Alabama and South Carolina have the only two EPA approved sites. It is not reasonable to assume that North Carolina and other states can ship all hazardous wastes to these two sites. The long term solution to this problem lies in recovery as opposed to disposal. Regardless, it is still necessary to have approved disposal sites now and after recovery techniques are improved.

Septage Study

With the use of funds available from a RCRA grant, the Sanitation Branch of the Environmental Health Section is studying the disposal of septage; septic tank pumpings. Septage includes the sludge, scum and liquid contents pumped from septic tanks, grease traps and holding tanks.

The importance of periodic septic tank pumping has received increased emphasis recently. Problems associated with disposal of septage should also receive more emphasis.

The study is designed to quantify and qualify the contents of septage, to determine existing management practices, and to identify feasible methods of treating and disposing of septage. The study is expected to continue for one year.

On-Site Sewage Systems

Another research project associated with septic tanks is the "N. C. Individual Waste Treatment Study," funded by a Coastal Plains Regional Commission grant. The Sanitation Branch developed a proposal in cooperation with N. C. State University and UNC-Chapel Hill to evaluate alternative or innovative individual sewage disposal systems.

Even though a substantial portion of the U. S. has used septic tanks for on-site waste disposal for many decades, there has been comparatively little rigorous scientific investigation. In certain soil and hydrologic systems, the effluent from conventional septic tanks with drain fields breaks out to the surface or percolates through sandy soils and contaminates ground water. This project will evaluate the movement and fate of certain contaminants resulting from installation of alternative systems which include alternating absorption fields, low-pressure pipe injection systems and mound systems.

The on-site work is being done in cooperation with the property owners and the health departments in Craven, Hyde and New Hanover counties. The final report will be completed by October 1, 1980.

Editor's Note: Presentation made at State Water Resources Conference at NCSU Faculty Club, April 30, 1980.

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WATER MANAGEMENT SEMINAR

Mr. D. G. Thompson, Manager of the Dandenong Valley Authority in Australia will talk with us about water management in his country, with emphasis on the management of estuaries. He is visiting Europe and the U. S. to study river basin management, sunset legislation and the use of aquaculture for wastewater treatment.

Hearing Room, Ground Floor

Archdale Building

July 8, 1980

12 Noon-12:30 Bring your sack lunches

12:30 - 1:30 SEMINAR

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