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# Water Current

Gary L. Lewis, Acting Director  
Volume 11, Number 2

Karen E. Stork, Editor  
March/April, 1979

## FROM THE DESK OF THE DIRECTOR . . . .

As the Acting Director of the Nebraska Water Resources Center, I welcome this opportunity to bring readers of our newsletter up-to-date on status changes, activities and directions of the Water Center during the past four months and in the months to come.

First, as most of you know, Wayne Hall accepted a Presidential appointment as Chairman of the Missouri River Basin Commission last December. Even though Wayne is now working in Omaha, he is maintaining his residence here in Lincoln so that we are frequently able to seek his advice and counsel, particularly on activities which he initiated as Director but was unable to complete after Uncle Sam pointed his long finger at Wayne and said "I want you."

With his help and with the help and support of the Water Center staff and the University faculty and staff, I feel we have been successful in maintaining most of the momentum established by Wayne during his short term with us. The temporary staff adjustments to compensate for Wayne's absence have been challenging, interesting, and I believe fruitful. Several of us have experienced numerous learning opportunities as a result of the action. Wayne was an effective, well-informed, authoritative Water Center Director and has definitely been missed. An announcement of the status of the Director's position should be available soon.

Much has been accomplished by the Center in the four months since Wayne took leave. We've succeeded in receiving and reviewing more than a dozen proposals for water research under our annual allotment program, and five sizeable proposals were submitted to the Office of Water Research and Technology (OWRT) for consideration as matching grants. Three new research

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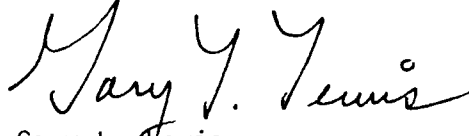
technicians have been hired in temporary and permanent positions with the Center. We've taught a panel-type weekly water policy seminar on East Campus and a course in Hydro-geography on City Campus. We've cooperated in preparing and conducting a three-day workshop on drought management strategies, and one staff member presented one of the last and one of the best papers at the annual Nebraska Water Conference. We've injected a variety of input to the task forces on implementing the President's initiatives on water policy, we've coordinated the majority of the University's input to the upcoming High Plains-Ogallala Aquifer economic study, and we've joined and participated in four task forces established to assist the Natural Resources Commission in analyzing legislative policy issues for our Unicameral.

Completion reports on two of our major contract projects have been filed during the four-month period, and one other is nearly completed. Overview conferences on water research in Nebraska were organized and conducted in Scottsbluff, North Platte and Lincoln during this time. Other conferences and workshops in Denver, Omaha, Houston, Atlanta and Washington, D.C. have been attended by Center personnel.

The Center Director has been appointed to two gubernatorial committees, and staff members have cooperated in the formation and functions of new University committees on teaching in water resources and on the overall role and mission of the Water Resources Center. We've had meetings with both our Executive and Advisory Committees, and somewhere in all this activity we were subjected to and survived an audit of our indirect overhead rate. We've managed to finalize our FY 1978 annual report to OWRT, and we are almost up-to-date on the responsibilities and assignments associated with our position as the office of the Executive Secretary of the Universities Council on Water Resources (UCOWR).

Just after Wayne left, we were asked by the Regents to develop a five-year plan for the Water Center and to incorporate this with similar plans of other units in the University. This coordinated plan will be presented to the Regents this fall.

After describing all of the things we have accomplished during this period, I should probably also list the things we haven't done. Rather than doing that, however, I'll simply state that our goal is to reduce the length of that list over the upcoming months. Our staff, students, faculty and off-campus cooperators have been patiently helpful during this transition period and we're grateful. The Water Resources Center has a few new faces and a few new functions, and we would welcome a visit by any of you. We're never too busy for old friends or for making new friends.

  
Gary L. Lewis,  
Acting Director

## ON THE HOMEFRONT

### GRANTSMANSHIP TRAINING PROGRAM

The Nebraska Water Resources Center will once again sponsor a Grantsmanship Training Program June 4-8, 1979 in the East Campus Union. This one-week small group workshop for non-profit, private and public agencies is intended to develop and improve the participant's funding and planning skills. In addition, the program also focuses on the primary sources of information that will better acquaint the participant with funding sources applicable to his or her field of interest. The session will be taught by a representative of the Grantsmanship Center in Los Angeles, and enrollment is limited to 24 persons.

The tuition for this one-week session will be \$325, payable to the Grantsmanship Center. For additional information, please contact Don Wilhite at 472-3805 or Karen Stork at 472-3305.

### HIGH PLAINS-OGALLALA AQUIFER STUDY

The Nebraska Water Resources Center is cooperating with various other University units in providing Nebraska's input to the High Plains-Ogallala Aquifer Study funded by the Economic Development Administration. The end objective of the six-state study is to develop alternative water supply conservation and/or transfer projects to promote the economic vitality of the High Plains Region of Colorado, Kansas, Nebraska, New Mexico, Oklahoma and Texas.

The study is being managed by a private contractor, Camp, Dresser and McKee. The state is responsible for planning inputs in the general areas of (1) State Agricultural and Farm-Level Research, (2) Energy Production Impacts, and (3) State Water Resources Evaluation and Impacts Research. The Water Resources Center and the Conservation and Survey Division are coordinating elements (1) and (3) with the Natural Resources Commission, and the UNL Energy Research Development Center is managing the energy impacts study under element (2).

### DROUGHT MANAGEMENT STRATEGIES WORKSHOPS

A Drought Management Strategies Workshop was held March 26-28, 1979 at the University of Nebraska. The international workshop was sponsored by the National Science Foundation and directed by Norman J. Rosenberg, Head of the Center for Agricultural Meteorology and Climatology at the University of Nebraska-Lincoln. Several members of the University faculty and staff, including two staff members from the Water Resources Center, were involved with Dr. Rosenberg during several months of the past year in planning, organizing and conducting the workshop.

Over 60 invited workshop participants met in groups with the planning staff to assess current knowledge concerning Great Plains drought, to assess the future vulnerability of the Great Plains to drought, to suggest strategies for mitigating drought, and to identify specific research needed in support of drought strategy development. The mixed-discipline discussion format facilitated much exchange of information.

The outcome of the workshop and discussions will be published in a conference report. Position papers prepared by Water Center staff and special reports by several of the attendees will be included.

## WATER RESOURCES IN NEBRASKA

### IWCC FORMATION ANNOUNCED

Nebraska Governor Charles Thone has announced the formation of an eleven-member Interagency Water Coordination Committee (IWCC). A similar action was recommended in a multi-agency report of November 15, 1978, containing a recommended work plan for the state water planning and review process. The Nebraska Unicameral is currently considering implementation of other recommendations in the report.

The Governor will chair the committee and Dayle Williamson, Executive Secretary of the Natural Resources Commission (NRC), will act as secretary. Other members of the IWCC include: John Neuberger, Department of Water Resources; Eugene Mahoney, Game and Parks Commission; Vince Dreeszen, University of Nebraska Conservation and Survey Division; Don Stenberg, State Office of Planning and Programming; Don Leuenberger, State Budget Office; Dan Drain, Department of Environmental Control; Mickey Stewart, Department of Agriculture; Henry Smith, Department of Health; and Gary Lewis, UNL Water Resources Center.

Thone noted that the committee will bring more coordination to water planning and policy and will involve other agencies than those recommended in the work plan. The committee should facilitate better communication among state agencies and university units involved in water planning and management.

### MISSOURI RIVER BASIN COMMISSION STUDY

Millard W. Hall, Chairman of the Missouri River Basin Commission, recently transmitted to the U.S. Water Resources Council, on behalf of the Commission, its report on the Yellowstone River Basin and Adjacent Coal Area Level B Study.

The study covered approximately 123,000 square miles in southeastern Montana, northern Wyoming, and southwestern North Dakota. The study was

funded jointly by the federal government through the U.S. Water Resources Council and by the three states in which the study was conducted. Those states also participated in the study.

The total \$1.2 billion cost for the plan's recommended projects and programs would be borne about 30 percent by federal sources and 70 percent by non-federal sources, based on prevailing practices. Excluded from these costs are private coal industry investments estimated to exceed \$6 billion.

The projects and programs recommended in the report are subject to the satisfactory completion of preconstruction studies by the appropriate agency.

Full implementation of the recommended plan elements could decrease streamflow in the Yellowstone River at Sidney, Montana, by about 448,000 acre-feet per year by 2000. This is in addition to an estimated 461,000 acre-foot depletion attributable to conditions that would occur without a plan.

Of this estimated 909,000 acre-foot-per-year depletion, 554,000 acre-feet are estimated to result from added irrigation development.

Coal energy requirements for water could amount to around 262,000 acre-feet. Of this, about 60 percent was estimated for electric generation and synthetic gas production and about 30 percent for slurry line export of coal. Total water requirements (262,000 acre-feet) for coal energy development are significantly less than some of the projections made in earlier studies. The conclusion is that there will be adequate water supplies for the energy industry.

Municipal, rural domestic, and livestock uses were estimated to increase by nearly 305,000 acre-feet during the time period. The outdoor recreation components in the plan will protect by designation and easement major areas along 1,630 miles of river.

Recommended accelerated land conservation on nearly 13 million acres of public and private land will provide benefits to lake and stream water subject to man-induced pollution.

Areas of woodland and unique areas totaling well over 1 million acres are recommended for public designation and preservation. Nearly 20,000 surface acres of water would be created for multiple uses including recreation, fishing, and aquatic habitat.

Copies of the report are available by contacting the Missouri River Basin Commission, Suite 403, 10050 Regency Circle, Omaha, Nebraska 68114.

#### ARMY CORPS OF ENGINEERS STUDY

A vehicle wash effluent study has been completed at Fort Carson, Colorado, by the Omaha District, U.S. Army Corps of Engineers. The study was conducted to characterize the wastes and determine the optimum methods of treatment of wastewater generated from track and wheel vehicle washing facilities. The U.S. Environmental Protection Agency and the State of

Colorado have promulated stringent effluent criteria which apply to the Fort Carson washrack discharges. Stanley Consultants of Muscatine, Iowa, were engaged by the Omaha District to study the most desirable and cost-effective methods of achieving compliance with the effluent criteria.

Although the scope of the initial study did not include investigation of the wash facilities themselves, the U.S. Army Construction Engineering Research Laboratory (CERL) has done considerable research on this subject. CERL recommends the centralization of the washing facility for a large number of wheeled and treated vehicles returning from maneuvers. Stanley Consultants has incorporated into their concept design the centralized concept including using recycled water from the equalization ponds for vehicle washing.

Further information on the study is available from the Omaha District, U.S. Army Corps of Engineers, Omaha, Nebraska 68101.

### FEDERAL HIGHLIGHTS

#### REORGANIZATION OF NATURAL RESOURCES ANNOUNCED

On March 1, 1979 the President announced that he will submit to the Congress a plan to consolidate the federal government's natural resources programs. The plan provides for a single Department of Natural Resources (DNR) with responsibility for the nation's oceanic and atmospheric resources, as well as public lands. The Department of Natural Resources would include the following:

- U.S. Forest Service - from Department of Agriculture
- All functions from the following Department of Interior agencies:
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Bureau of Mines
  - Bureau of Reclamation
  - Fish and Wildlife Service
  - U.S. Geological Survey
  - Heritage Conservation and Recreation Service
  - National Park Service
  - Office of Surface Mining Reclamation and Enforcement
  - Office of Territorial Affairs
  - Office of Water Research and Technology
- National Oceanic and Atmospheric Administration - from Department of Commerce

The Secretary of Natural Resources would also serve as Chairman of the Water Resources Council, whose functions have recently been expanded.

The proposed reorganization will regroup natural resource activities, building on the Forest Service, NOAA and other units. The DNR would contain

four major administrative units: (1) oceans and atmospheric resources; (2) public lands, forests and water resources; (3) resource sciences and data; and (4) parks, recreation, heritage and wildlife.

#### WRC RELEASES SECOND NATIONAL WATER ASSESSMENT

Cecil D. Andrus, Chairman of the U.S. Water Resources Council (WRC) has announced the publication of the Second National Water Assessment. The report, entitled "The Nation's Water Resources - 1975-2000," is a summary of a four-volume study. The remaining three volumes are expected to be released in June, 1979.

The publication covers water supply and water use and identifies critical water problems, including surface water supply, overdraft of groundwater, pollution, flooding, erosion and sedimentation, dredging, draining of wetlands and degradation of bay, estuary and coastal waters.

The report notes that "Significant achievements have been made in preserving water and harnessing its power. Although interest in water conservation and environmental protection is growing, still greater efforts are needed. Without intensified dedication to careful management of water resource, pressures from our technological society will continue to deplete and degrade the Nation's water supply."

The summary report is available for \$3.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The stock number is 052-045-0051-7.

#### DAN BEARD SPEAKS ON WATER POLICY AT ASCE HOUSTON MEETING LUNCHEON

Mr. Dan Beard, Deputy Assistant Secretary for the Department of Interior, spoke on behalf of Assistant Secretary Guy Martin at the recent Houston ASCE Specialty Conference on Water Resources. In discussing the implementation of President Carter's Water Policy Initiatives, Dan noted that the nineteen task forces are looking for a "comprehensive and intergrated" national approach to water management. Dan stated that the task force groups are doing the work of "implementing what the president has decided." Beard also noted that all of this activity represents a significant change from water development to improved water management in this nation, involving the federal government "only when necessary" and giving greater emphasis to local and state involvement. This change from development to management also means that a "greater emphasis will be placed on conservation and non-structural solution", noted Mr. Beard.

In closing, Dan stated that federal funding for projects will continue, but that they'll "be better projects stressing more sound solutions." He also stated that like it or not we "are going to make water conservation work for all of us."

#### VIESSMAN HIGHLIGHTS POLICIES FACED BY 96TH CONGRESS

Speaking at the American Society of Civil Engineers (ASCE) Specialty Conference on Water Resources in Houston at the end of February, Dr. Warren



Viessman, Senior Specialist with the Library of Congress, elaborated on several water policy issues which will be faced by the 96th Congress. At the head of the list is the issue of reorganization, and the President did announce his proposal on March 1, 1979 to form a Department of Natural Resources (DNR) involving many agencies. As a result of intense political pressure, the President revised his reorganization to exclude elements of the major water construction and planning agencies from DNR. The newly-proposed department will now consist of all functions of the Old Department of Interior plus the U.S. Forest Service and NOAA.

Another issue faced by Congress is conservation, Viessman explained. Some new legislation has been proposed but involves mostly rules and regulations covering existing programs. Other issues facing the Congress are cost-sharing; waterway users' charges (should the fee be increased or decreased?); the water projects budget (President Carter feels that most good projects are already funded); the Clean Water Act (the need for oversight hearings regarding this act); the Safe Drinking Water Act (concerns with high costs of fulfilling the intent of the act); increased funding for states to use in resource planning; funding to states for conservation programs; and other issues including groundwater management, instream flows, the role of federal government in state planning, and a reassessment of federal water goals.

## CONFERENCES

### SHORT COURSE ON WATER SUPPLY ENGINEERING

The Department of Environmental Sciences and Engineering, and Continuing Education School of Public Health, University of North Carolina at Chapel Hill are sponsoring a Short Course on "Water Supply Engineering: Quality and Treatment," May 21-23, 1979.

The course has been developed to provide a critical review of recent developments in the water supply field, and will focus on water quality and water treatment aspects of water supply engineering. It will be presented at an advanced level for individuals actively engaged in the water supply field. The course is specifically intended for consultants, municipal engineers, regulatory agency personnel and researchers in academic, industrial, consulting and governmental institutions.

The registration fee for the three-day course is \$100 and will cover lecture notes and supplies, banquet, cocktail hour and refreshment breaks.

For further information, contact: Dr. Philip C. Singer or Ms. Phyllis Carlton, Department of Environmental Sciences and Engineering, The University of North Carolina, School of Public Health 201H, Chapel Hill, North Carolina 27514. Telephone: (919) 966-1023.

### CALL FOR PAPERS - STORMWATER RUNOFF

A national conference to discuss responses of receiving water bodies to urban and non-urban stormwater runoff will be held at Orlando, Florida on

November 26-28, 1979. The conference is sponsored by the U.S. Environmental Protection Agency, American Society of Civil Engineers, Florida Section, and the University of Central Florida.

Prospective participants are cordially invited to submit abstracts for evaluation by the selection committee. Invited and contributed papers will be critically reviewed and selected for presentation in traditional technical sessions. Topical areas will include: rainfall-runoff relationships, prediction of runoff water quantity and quality from urban and non-urban areas, impact of runoff water on lakes/rivers/estuaries, fate of pollutants including heavy metals/nutrients/toxic substances, and management techniques to control stormwater effects.

Abstracts should be typed double-spaced and be between 250-500 words. Three copies should be submitted to: Dr. Yousef A. Yousef, P.E., College of Engineering, CEES Department, University of Central Florida, P.O. Box 25,000, Orlando, Florida 32816.

The abstract should be submitted before April 30, 1979. The senior author of each abstract will be notified by the selection committee on the decision before the end of May. The full text of the paper should be submitted before November 1, 1979 for inclusion in the proceedings.

#### SHORT COURSE ANNOUNCEMENT

The College of Engineering, Cornell University, announces the short course: "Boundary Integral Equation Method Applied to Flow in Porous Media" July 16-20, 1979 at Ithaca, New York.

Further information and registration forms may be obtained from the Director of Continuing Education, College of Engineering, Cornell University, Carpenter Hall, Ithaca, New York 14853. Telephone (607) 256-4326.

#### SHORT COURSE ON UNSTEADY FLOW IN PIPELINES

A Short Course on Fluid Transients in Piping Systems will be presented at the University of Michigan July 9-19, 1979. The course is intended for practicing engineers who desire an understanding of transient flow in fluid systems and who wish to acquire a capability in problem solutions with the digital computer. Emphasis will be placed on the solution of practical problems in a variety of fields such as fluid transportation systems, cooling water condenser systems in power plants, and complex piping systems that include various boundary conditions.

Topics will include concepts of transient flow; derivation of basic equations for liquids and transformation by method of characteristics; series, branching, and looped systems; boundary conditions such as turbo-machines, valves, air chambers, surge devices, condensers, etc.; vapor column separation; natural gas unsteady flow in pipeline systems, and transients in liquified natural gas systems.

For further information contact Professor E. Benjamin Wylie, Department of Civil Engineering, University of Michigan, Ann Arbor, Michigan 48109.

## INTERNATIONAL CONFERENCE

The International Federation of Operational Research Societies (IFORS) and the Operations Research Society of Israel (ORSIS) will host an international conference on "Operations Research in Agriculture and Water Resources" November 26-29, 1979 in Jerusalem, Israel. The conference will be devoted to both theory and applications of operations research in agriculture and water resources. It is intended that the program will be of interest to theoreticians, model designers and practitioners and will promote intellectual interaction among them.

Fields of application include agrobiological systems and biological processes, agro-industrial processes, agricultural planning and management, regional planning, finance and investment in agriculture, marketing and transportation, extension and training in agriculture, energy and water resources and water quality control.

Subject areas will include mathematical programming, dynamic programming, optimal control, stochastic processes, simulation, systems analysis, information systems, decision theory, game theory and partial differential equations.

Those interested in presenting a paper are requested to send an abstract of 500 words for consideration by the Program Committee by May 1, 1979.

For additional information or to submit an abstract, contact: ORAGWA Secretariat, IFORS-ORSIS, P.O. Box 16271, Tel Aviv, Israel. Telex: 341171 KENS IL.

## POSITIONS AVAILABLE

### OPENINGS AT TEXAS TECH

Texas Tech University - Department of Civil Engineering invites applications for tenure-track positions at the Assistant Professor level in (1) structural, and (2) environmental (sanitary) engineering. A doctorate in engineering is required and preference will be given to candidates holding the BS degree from an ECPD accredited engineering department. Applicants must possess potential for undergraduate and graduate teaching and research. Preferred starting date is September, 1979. TTU is a multipurpose state supported institution with an enrollment of over 22,000 students. The CE department has over 300 undergraduate and 30 graduate students. The department offers programs leading to the BSCE, MSCE and PhD degrees.

Interested applicants should send resume, names of three references, and description of teaching and research interests to Dr. Robert M. Sweazy, Search Committee Chairperson, Department of Civil Engineering, Texas Tech University, Lubbock, Texas 79409. Texas Tech University is an equal opportunity/affirmative action employer.

POSITIONS AVAILABLE AT WYOMING

The Wyoming Water Resources Research Institute at the University of Wyoming has three job openings as follows:

Research Engineer III (Groundwater Hydrologist) - The hydrologist would be responsible for development of research information and techniques for projects now underway and to initiate new programs of water resources research with emphasis on groundwater hydrology. He would develop research proposals and carry out the research so proposed, and would eventually become involved in teaching in the academic graduate water resources curriculum.

Applicants for this position must have an M.S. degree and several years of experience in surface and groundwater hydrology or a related field, such as civil engineering or geology, with a specialty in hydrology or equivalent professional experience.

Research Engineer III (Surface Water Hydrologist) - The engineer would be responsible for development of research information and techniques for projects now underway and to initiate new programs of water resources research with emphasis on surface water hydrology. He would develop research proposals and carry out the research proposed, and would eventually become involved in teaching in the academic graduate water resources curriculum.

Applicants for this position must have an M.S. degree and several years of experience in surface water hydrology (including experience in the areas of modeling and erosion and sedimentation) or a related field, such as civil engineering or geology, with a specialty in hydrology or equivalent professional experience.

Research Engineer III (Water Quality Specialist) - The engineer would also be responsible for development of research information and techniques for projects now underway and to initiate new programs of water resources research with emphasis on water quality. He would develop research proposals and carry out the research proposed. He would eventually become involved in teaching in the academic graduate water resources curriculum.

Applicants for this position must have an M.S. degree and several years of experience in the water quality/environmental engineering field and/or a related field, such as civil engineering, geology, chemistry, hydrology or limnology, with a specialty in the water quality area. Modeling experience is required. A certified chemist is preferred.

Salaries for all positions are commensurate with experience.

For additional information or to submit an application, contact: Dr. Paul A. Rechard, Director, Water Resources Research Institute, University of Wyoming, P.O. Box 3067 University Station, Laramie, Wyoming 82071. Telephone: (307) 766-2143.

DIRECTOR OF INSTITUTE OF WATER RESEARCH

Applications are invited for the position of Director of the Institute of Water Research at Michigan State University. The Director is principally an administrator responsible for the Michigan Office of Water Research and Technology programs, Michigan State University participation in the Sea Grant program, operation of a field scale wastewater recycling facility, and supervision of four faculty members, plus support staff.

Appointment will be Associate Professor or Professor, depending on qualifications. The candidate should be an established professional, with a Ph.D., published evidence of scholarly activity in water resources and a

*effective chlorination will depend on a number of factors such as the amount of chlorine available for disinfection, the water temperature, the pH of the water, the presence of organic matter, and the absence of protected pathogens by injecting directly into the return irrigation pipe.*

NEWSLETTER ITEMS SOLICITED

The Water Current Newsletter will publish, without charge, announcements, programs for up-coming conferences, employment opportunities or other newsworthy items on hydrology, water resources or related topics. We will be happy to help advertise any water-related job openings in this newsletter. Please send any job openings you would like to have published to the editor, and we will see that they are advertised.

QUESTIONS AND INQUIRIES

Newsletter items and inquiries should be sent to: Editor, Nebraska Water Resources Center, 310 Ag. Hall - East Campus, University of Nebraska, Lincoln, Nebraska 68583; or phone, (402) 472-3305.

A number of methods for minimizing plant pathogen contamination of reuse water are available, but chlorination may be the simplest and least expensive. The dearth of information on chlorinating agricultural water necessitated a determination of how water quality affects chlorination. Reuse water samples were assayed by standard procedures for temperature, pH, turbidity, total alkalinity, hardness, solids (suspended, volatile and total), ortho phosphate and nitrate. Ammonia plus organic nitrogen and pH had the most significant effect on chlorine disinfection. The pH levels of reuse water (6.3 to 8.6) covered a critical range affecting the disinfection efficiency of chlorine. Organic plus ammonia nitrogen was estimated by breakpoint chlorination at levels up to 10 mg/l, and interfered with chlorination by reacting rapidly with chlorine, forming chloramines of relatively weak disinfection capabilities. Phytopathogenic bacteria were similar to Escherichia coli in that low levels of free chlorine were adequate for disinfection. A free chlorine residual of 0.01 to 2.0 mg/l depending on pH and contact time, or a combined chlorine residual of 5 to 10 mg/l provided 99% kill. Spores of fungal pathogens, however, required 10-15 mg/l free chlorine for 5 minutes at pH 6.5 for a 99% kill.

Pathogens located within host tissue are protected from chlorine. Thus, effective chlorination will depend on adapting other methods such as sedimentation or filtration to eliminate protected pathogens before chlorine treatment. Effective chlorination of reuse water may be obtained in the absence of protected pathogens by injecting directly into the return irrigation pipe.

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The Water Current Newsletter will publish, without charge, announcements, programs for up-coming conferences, employment opportunities or other newsworthy items on hydrology, water resources or related topics. We will be happy to help advertise any water-related job openings in this newsletter. Please send any job openings you would like to have published to the editor, and we will see that they are advertised.

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