

# Minnesota Ground Water Association

Volume 11, Number 1: May, 1992

## President's Page

1992 is the Minnesota Ground Water Association's (MGWA's) tenth year. The environmental field certainly has expanded for professionals and students during this time. MGWA members have shared many experiences, educational and social, during these ten years. There are more to come.

I hope the MGWA conferences are fulfilling your expectations. The April 14th MGWA conference on "Innovations and Updates on Drilling Technologies and Well Construction" was attended by approximately 130 people. The highlight for conference attendance has been the approxi-

mately 240 attendees for the 1990 Environmental Risks-Contrasting Perceptions Conference with Dr. Jay Lehr, former editor of the journal *Ground Water*; Janet Hathaway, Natural Resources Defense Council; Dr. Vernon Houk, Assistant Surgeon General and Director of the Center for Environmental Health and Injury Control, Centers of Disease Control; and Dr. David Belluck, MPCA. The conference was organized by Bob Karls, Bob Beltrame, Gordy Hess, and Don Jakes.

Other conference topics in the past two years have included solute transport in a fracture network, a project management workshop, remediation technolo-

gies for the unsaturated zone and innovative field technologies. There is still time for your input for the fall conference agenda.

Last year a geology field trip to southeastern Minnesota, sponsored jointly with American Institute of Professional Geologists (AIPG), was added to the MGWA activities. At the request of many members, another field trip to northern Minnesota is being planned for September 11 and 12. There will be speakers for Friday afternoon, a dinner Friday night and a field trip on Saturday.

Also, the annual Twin City Geologists - AIPG - MGWA pig roast is being planned - with much help from Bruce Bloomgren. Although a final date has not been selected, look for a flyer announcing the picnic, probably the last weekend in July. Hope to see you there.

—Sheila Grow

## Legislative Update

The following is a summary of legislation regarding state agencies that may be of interest to you.

**Solid Waste** (Omnibus Budget Bill H.F. 2694/S.F. 2788): The Minnesota Pollution Control Agency (MPCA) initiated a effort to help expedite the evaluation of closed landfills without using the Superfund process. A fee of twenty cents per cubic yard for garbage disposal in state landfills, incinerators, and compost facilities and for out-of-state transfer will replace the present permit fee. The reallocation of fees will be for one year. The fees will allow the Minnesota Pollution Control Agency to contract with environmental consulting firms to conduct preliminary investigations at closed landfills. Over eighty closed landfills have been identified. The MPCA anticipates that 20 to 40 landfills will be investigated next year. Based on the results of the investigations, the MPCA will evaluate and prioritize the landfills that need further investigation and/or cleanup. The legislation does not provide additional staff for the MPCA to oversee the work.

**Property Transfer** (H.F. No. 1985, Minn. Statutes, Chapter No. 512): In response to the growing demand to facilitate the investigation and cleanup of contaminated property by volunteer persons, the legislature passed the land recycling act of 1992.

This bill extends the MPCA authority to help a person, who requests MPCA assistance, to determine whether property has been the site of a release and, if necessary, what corrective actions will be required. The person requesting assistance pays for the MPCA oversight. The bill also

—continued on page 2

May, 1992

## Table of Contents

<i>President's Page</i> .....	1
<i>ASFE Model Contract</i> .....	2
<i>Board of Directors</i> .....	3
<i>Spring Meeting Report</i> .....	3
<i>Ad Policy</i> .....	4
<i>Member News</i> .....	4
<i>Prehistoric Well Discovered in Germany</i> .....	5
<i>U of M Seminars</i> .....	5
<i>Pesticide Survey</i> .....	6
<i>Calendar</i> .....	7
<i>Sonic Drilling</i> .....	8
<i>Directory Update</i> .....	9

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## ASFE Publishes Model Contract for Preliminary Site Assessments

*Standard Form of Agreement for Preliminary Site Assessment Services* is a new model consultant-client contract for use in preliminary site assessment (PSA) work. Published by the Association of Engineering Firms Practicing in the Geosciences (ASFE), the contract is written in plain English so it can be easily understood by both consultants and their clients.

Basic elements of the model contract include the general nature of site assessment, scope of services, additional and excluded services, client responsibilities, limitation of responsibility, payment, dispute resolution, discovery of unanticipated pollutant risks, and disposition of samples and equipment. The model contract also addresses reports, recommendations, and ownership of documents; termination; severability and survival; assignment; and governing law.

*Standard Form of Agreement for Preliminary Site Assessment Services* may be ordered from ASFE at \$10 per copy. Send requests with payment to ASFE, 8811 Colesville Rd. Ste. G106, Silver Spring, MD 20910. Remittance must accompany orders.

—reprinted from *Ground Water Monitoring Review*, Winter '92.

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## Sponsor a Recycled Newsletter!

The reality of using recycled paper is that it costs more. We need \$100 per newsletter to cover the additional costs. Please consider sponsoring all or part of the additional cost for a newsletter in exchange for thanks and recognition in the newsletter which you sponsor. Contact Jan Falteisek at (612)297-3877.

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## Ground Water Information System Organized for Great Lakes Region

Ground water specialists from eight states and two Canadian provinces in the Great Lakes region met recently in Minnesota to organize a communications and information sharing network called the Ground Water Information System (GWIS, pronounced *Gee Whiz*).

The conference sponsor and host, the Freshwater Foundation of Wayzata, Minn., has received a grant from the W.K. Kellogg Foundation to develop and facilitate the use of GWIS.

The project is intended to provide basic information to assist local government officials with ground water policy development.

The 60 conference participants developed a list of the most important ground water problems in the region and discussed the best ways to get information about these problems into the hands of the local decision makers.

The conference participants also helped define specific tasks and strategies to implement GWIS. For example:

- two persons from each state and province will serve on the GWIS steering committee which will meet quarterly.
- a quarterly ground water insert for *U.S. Water News* will be developed, with the first insert appearing in early 1992 (ground water specialists throughout the Great Lakes region are encouraged to submit articles or article ideas for the insert); and
- workshops on ground water issues will be held during the next few years at several locations in the region.

For more information about the GWIS project and its planned activities, contact: Martha Hartfield, director of ground water programs, Freshwater Foundation, Spring Hill Center, 725 County Road Six, Wayzata MN 55391, (612)449-0592.

—continued from page 1

provides protection from liability to the person volunteering to conduct the work if specific conditions are met. The property transfer program was started in 1988.

Since then, four MPCA staff have worked on over 220 projects.

This bill provides for seven additional staff positions at the MPCA to oversee voluntary cleanups.

Well abandonment (H.F. No. 2717, Minn. Statutes, Chapter No. 544): This legislation extends the Minnesota Department of Health (MDH) authority to require proper sealing of wells and borings. The legislation also establishes a well sealing account that may be used to cover the costs of sealing wells and borings. However, the property owner is liable for the costs of sealing the well or boring and the MDH will attempt to recover the costs from the property owner.

Report on environmental consulting services (H.F. No. 2717, Minn. Statutes, Chapter No. 544): Legislation requires "the commissioners of commerce and agriculture, in consultation with the commissioners of the pollution control agency and finance, the attorney general, and appropriate professional organizations" to prepare a report for the legislature describing the services and reasonableness of costs for which reimbursements were paid from the Petrofund and Agricultural Chemical Response and Reimbursement Account. The report will include recommendations "to ensure that environmental consulting services for which reimbursement is paid by the state are cost-effective and of a minimum acceptable level of quality". Expect some solicitation for advice. Any volunteers?

—Sheila Grow



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May, 1992

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## MGWA Spring Meeting — S.R.O.

It was standing room only at the Spring meeting of the Minnesota Ground Water Association on April 14th at the Earle Brown Center on the St. Paul Campus of the University of Minnesota. Members attended a program on updates and innovations in drilling and well construction. Topics included directional drilling, wire-line drilling, how to talk with your drilling consultant, and an update on the state Well Code.

Before the meeting got underway, Sheila Grow, MGWA President, announced a fall field trip September 11-12 to northern Minnesota and the Duluth area. This trip is being planned jointly with AIPG, as was the highly successful field trip of last fall.

George Lososky of Eastman Christensen Environmental Systems explained how it is possible to drill, not vertically, but (deliberately) at an angle or even horizontally. George explained how oil-field and engineering technology has been adapted to the environmental field in which problems are typically quite shallow and in unconsolidated materials instead of deep and in hard rock. With angle drilling it is possible to place lengths of screen horizontally to control, recover, or remediate contamination. The horizontal screen has several good hydraulic properties for environmental purposes. The horizontal screen creates a linear sink or source with greater screen length compared to vertical wells. In addition, the longer horizontal screens have lower flow rates but greater specific capacity. While angle drilling isn't for every site, sites which would require many vertical wells, e.g. a typical pump and treat project, may benefit most from horizontal screens.

Wire-line drilling techniques were presented by Walter Svendsen of Longyear. The advantage of wire-line drilling is the ability to obtain an undisturbed sample without pulling the entire drill rod and bit assembly from the hole.

"How to Talk to Your Driller" was presented by Don Stormoe of American Engineering Testing. Don emphasized obtaining quality results. But to achieve quality requires a lot of attention to detail before your driller ever gets on site. As Don explained, arranging drilling services includes scoping and defining the project, providing information on site conditions, specifying a schedule, agreeing on pricing and payment, and finally, getting all the details down in a contract. Performing the services also requires attention to detail in order to achieve a quality result. Details include utility checks and other clearances, well permits, proper installation, project clean up and reporting.

Finally, Bud Anderson of the Minnesota Department of Health provided an update on the revisions to the state Well Code revision. Bud answered questions about the current code, and permit and construction policies, as well as the anticipated time when the revisions will go into effect.

—Jan Falteisek

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## ASTM Geostatistics

A growing interest in geostatistical methods has prompted the organization of Section D18.01.07 on Geostatistics. The section is under the jurisdiction of D18.01 on Surface and Subsurface Characterization, a subcommittee of ASTM standards-writing Committee D-18 on Soil and Rock.

Interested parties are invited to participate in the work of this section.

For more information, contact Section Chairman, R. Mohan Srivastava, 3900 Quebec St., Vancouver, British Columbia, Canada V5V3K8, (604)687-3441; or subcommittee chairman, Ivan Johnson, 7474 Upham Court, Arvada, CO 80003, (303)425-5610.

## Member News and Changes

The St. Cloud offices of **Twin City Testing Corporation** have moved. Please note the change of address:

Twin City Testing Corporation  
1996 247th St.  
St. Cloud, MN 56301

The fax and phone numbers remain the same: (612)255-9467 (fax) and (612)255-9014

The Association for Women Geoscientists (AWG) announces the election of 1992 officers:

Sharon Robertson, a geochemist with Estee Lauder in New York is President; Jan Wright, a professor at the University of Nebraska is in her second term as Vice President; Sarah Stoll, a retired petroleum geologist from Sheboygan, Wisconsin, is Editor; Cathryn Stewart, a petroleum geologist from Oklahoma City, is Secretary; and **Toby McAdams**, a University of Minnesota graduate student, is Treasurer. Outgoing President, **Jane M. Willard**, Principal Consultant at EnPro Assessment Corp., in St. Paul continues on as Past President.

**SEC Donohue Inc.** was created through the recent merger of Donohue & Associates, Inc. and Serrine Environmental Consultants, Inc. Headquartered in Greenville, South Carolina, the firm is a wholly-owned subsidiary of Wheelabrator Technologies, Inc.

## "Waterful" Book Covers

Want to give students something that will get used and read? Then you need to get AWWA's new (and hot!) bookcovers.

AWWA book covers have been carefully developed with young students in mind. The series has three different designs - fun water conservation ideas for school-age children, water facts of life, and the last on amazing statistics on how much we use water for a variety of uses. They are printed on durable recyclable paper which allows the students to illustrate their own ideas about water. You also have the option of custom imprinting these bookcovers with your company's name, address and phone on the back (so it appears on the back cover of the covered book). Cost for 30 - 1000 copies is \$.29 each

You can order these colorful book covers from AWWA by calling (303)794-7711.

## East European Trade Information Available

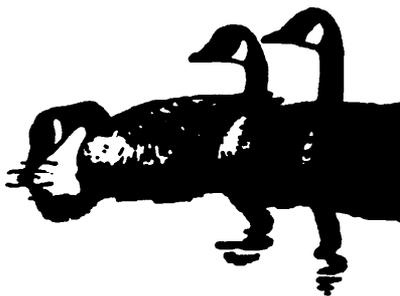
A series of six reference books to aid businesses considering trading with or investing in the Soviet Union or Eastern Europe can be obtained from the U.S. Chamber of Commerce.

Separate books cover the Soviet Union and the Baltic States, Poland, Czechoslovakia, Romania, Hungary, and Bulgaria.

They contain brief overviews of recent trade developments; lists, including phone numbers and addresses, of key contacts in the countries as well as experts on the nations; trade services available in the countries; and synopses of investment-related legislation.

The books are \$42.50 each for U.S. Chamber members and \$47.50 for non-members. They are also available as a package at a discount rate of \$215 for Chamber members and \$240 for non-members.

To order, write Ingrid McKenzie, U.S. Chamber of Commerce, 1615 H St., N.W., Washington DC



## Newsletter Advertising Policy for 1992

Advertising space is available in this newsletter to businesses and organizations. Display ads (4 issues = 1 year) are charged by fractional page:

Size	inches	Annual Rate
business card	3.5x2.4	\$50
quarter page	3.5x5	\$90
half page	7x5	\$170
full page	7x10	\$320

Copy should be a photostat of your camera-ready artwork.

The Editor has final determination on the acceptance of materials submitted. There are no commissions on ads. Advertising copy must be received by the publication deadlines: February 15, May 15, August 15, or November 15. The ad should be accompanied by a purchase order or a check. Checks should be payable to the Minnesota Ground Water Association. All materials should be sent to the Editor:

Jan Falteisek  
Editor, MGWA Newsletter  
DNR - Division of Waters  
500 Lafayette Road  
St. Paul, MN 55155-4032

## Monitoring Wells

Call  
**THEIN WELL**

(Shakopee)  
**(612)-445-9380**

Statewide  
**1-800-450-8000**

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## Guide to State Agency Services

The 1992-1995 Minnesota Guidebook to State Agency Services is now available. It is a reference and "Owner's Manual" to Minnesota State Government. This reference contains more than 600 pages of entries to help you cut through red tape and obtain the services and information you need:

- Detailed description of state agencies, their functions and services.
- Addresses, phone numbers and key contact people for each agency.
- Election and voting information.
- Printed materials available through state agencies and their libraries.
- License requirements and fees.

The guidebook serves as a reference for:

- Understanding the structure of Minnesota government.
- Gaining access to government services.
- Participating in state policy making and service delivery.
- Applying for grants, bidding on contracts.
- Understanding the law-making process.
- Contacting legislators.
- Learning statistical and historical information about Minnesota.

New to this edition are special "citizen participation" sections listing task forces, advisory committees, or boards affiliated with an agency. To order *Minnesota's Guidebook to State Agency Services* call Minnesota's Bookstore at (612)297-3000 (Metro) or (800)657-3757. Cost is \$18 per copy and includes tax and shipping.

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## National Ground Water Education Program Initiated

The Nebraska Ground Water Foundation, with funding from the W.K. Kellogg Foundation, recently initiated the National Ground Water Education Consortium.

Through an informal, decentralized network, the consortium will link successful ground water education programs across the United States and Canada.

The consortium also will:

- provide a forum for ground water education groups across the country to address issues and common concerns;
- exchange ideas, strategies and lessons learned by the various groups and,
- capitalize on the strengths and successes of the various programs.

For more information on the consortium, contact: Susan Seacrest, Nebraska Ground Water Foundation, P.O. Box 22588, Lincoln, NE 68542-2558, (402)423-7155.

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## U of M Geology and Geophysics Seminars

**May 28, 1992.** *Paleoclimate Studies in the Large Lakes of the East African Rift Valley.* Prof. Thomas C. Johnson, Department of Geology, Duke University Marine Laboratory, Beaufort.

**May 29, 1992.** *Challenges in High-Resolution Paleoclimatic Studies of Lake Sediments.* Prof. Thomas C. Johnson, Department of Geology, Duke University Marine Laboratory, Beaufort.

**June 4, 1992.** *Modeling Lake-Atmospheric Interactions I: Overview of Applications to Climate Research.* Dr. Steven Hostetler, U.S. Geological Survey, Boulder.

**June 5, 1992.** *Modeling Lake-Atmospheric Interactions II: Focus on Paleoclimate and Discussion.* Dr. Steven Hostetler, U.S. Geological Survey, Boulder.

Thursday Seminars are presented at 3:30 pm in 110 Pillsbury Hall, followed by refreshments in 121 Pillsbury Hall.

Friday Seminars are presented at 10:15 am in 121 Pillsbury Hall.

For information call the Geology Dept. at (612)624-1333.

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## Prehistoric Wooden Well Discovered in Germany

The puzzle of how a prehistoric village could be sited 3 km from the nearest watercourse has been solved. The villagers - in 5303 B.C. - had constructed a great wooden well. This well is in a remarkable state of preservation, which means that the construction technique used by its Neolithic builders, and even the tools used, can be assessed.

Since mid-1989, a team of archaeologists from the Landschaftsverband Rheinland, led by Jürgen Weiner, have been excavating a gravel-pit at Kückhoven, in northwestern Germany, where the remains of a settlement of the Linearbandkeramik culture are under threat and will be destroyed by gravel extraction in a few years. Most Linearbandkeramik settlements were villages of agriculturalists and pastoralists, and post holes uncovered by the team show that the people lived in long timber houses. The sites of the period are normally located on good loess soils near streams or rivers - but not that of Kückhoven, which lay on an expanse of loess but seemed to be nowhere near a source of water.

Late in 1990 the first fragments of oakwood were found, and subsequent excavation this past summer located, at a depth of 7m below the present ground surface, a shaft with vertical walls of 5 or 6 m with abundant wooden fragments in its center. A test-pit revealed a further length of 7.6 m of shaft below and, in the middle, two rectangular well-frames in wood. The outer one is older, and is 3m square, while the inner, placed in its northwest corner, is 1.6m square, and seems to have been built after the older one was damaged. Fragments of wickerwork suggest that the upper part of the shaft may have been lined with this material.

Initial results from radiocarbon dating have been confirmed and

—continued on page 10

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## New NSF Research Program In Hydrologic Sciences

The President's Budget Request for Fiscal Year 1993, announced on 29 January 1992, includes a request for \$2.5 million to begin a new basic research program in hydrologic sciences at the National Science Foundation.

The new program, to be located within the Foundation's Division of Earth Sciences, will provide funding for basic research dealing with the Earth's hydrologic cycle and the role of water on and near the continental surfaces of the Earth.

Research proposals relating to water in the form of precipitation, lakes, streams, and groundwater, and their interactions with landforms, climate, weather, the biosphere, and the Earth's crust will be eligible for submission to the new program. Where appropriate, research proposals will be considered for joint review and possible joint funding with other Foundation programs including those in Engineering, Biotic Systems and Resources, Atmospheric Science, and Polar Programs.

Subject to appropriation of funds by Congress, it is expected that the new program will receive proposals from university and college investigators beginning in May 1992 for funding during FY 1993. Proposal deadline dates

are expected to be 1 June 1992 and 1 December 1992. Management of the program will be closely coordinated with the NSF program in Continental Hydrologic Processes.

For further information about the program about procedures for proposal submission, and about opportunities to serve as program officer or proposal reviewer, contact James Hays, Division Director, Division of Earth Sciences, National Science Foundation, Washington, DC 20550, (202)357-7958.

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## Phase II Report Issued on Pesticide Survey

The U.S. EPA has released the Phase II report of its national survey of pesticides in drinking water wells. This report is a comprehensive analysis of factors associated with contamination of drinking water wells by pesticide and nitrates.

The survey tested water from 1349 community and domestic rural wells for 101 pesticides, 25 pesticide degradates, and nitrate. Some samples were taken in every state.

The Phase II analyses examined patterns of associations between the presence of pesticides and nitrate in drinking water wells and the factors that may influence the contamination of these wells. While numerous associations

were found, many that were expected were not found, highlighting the difficulty of trying to identify simple relationships to explain the very complex interactions among agricultural activity, ground water, and drinking water wells.

The results of the Phase II analyses suggest several avenues for the direction and design of future research. Perhaps the most important lesson from the survey is that site-specific chemical use and aquifer sensitivity information is needed to more accurately predict the occurrence of pesticide and nitrate in drinking water wells. Additional study is needed to investigate the greater prevalence of contaminants in community water wells compared to domestic rural wells, the links between surface and ground water contamination, the effects of recharge and ground water flow, and the effects that seasons and time have on contamination. Future surveys can also benefit from the multiresidue chemical analysis methods pioneered by the survey.

Executive summaries of the Phase II report can be obtained by calling the Safe Drinking Water Hotline at (800)426-4791, 8:30 am to 4 pm EST. Copies of the full Phase II report are available from the National Technical Information Service. Call (800)336-4700.

—*Water Well Journal, April '92*

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## Join the Minnesota Ground Water Association!

If you are reading this newsletter second-hand, we'd like to take this opportunity to invite you to become a member of **MGWA** for 1992. Annual dues are \$15 for professional members and \$10 for students. Additional donations toward the use of 100% recycled paper will be gratefully accepted.

Just complete the form below and mail to: MGWA, c/o WRI, 4779 126th St. N, White Bear Lake, MN 55110.

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Which Address should we use for Directory Listing? \_\_\_\_\_  
Which Telephone Number should we use for Directory Listing? \_\_\_\_\_

## Calendar

**May 28-29, 1992.** *Field Monitoring with emphasis on Ground Water Protection using Portable Gas Chromatography and Other Field Instrumentation.* To be held in Toledo, Ohio. Contact the University of Toledo at Seagate Center, Division of Continuing Education, 401 Jefferson Ave., Toledo, OH 43604.

**June 9-10, 1992.** *Landfills and Ground Water Quality Protection Issues.* To be held in Minneapolis by NGWA.

**June 9-11, 1992.** *Introduction to Ground Water Geochemistry.* To be held in Minneapolis by NGWA.

**June 29 - July 1, 1992.** *Modeling Workshop for Landfill Design Evaluation.* To be held in Milwaukee, Wisconsin. Contact: Center for Continuing Engineering Education, College of Engineering and Applied Science, 929 North Sixth Street, Milwaukee, WI 53203.

**July 13-22, 1992.** *7th International Symposium on Water-Rock Interaction.* To be held in Park City Utah. Contact Yousif Kharaka, Secretary-General, U.S. Geological Survey, MS 427, 345 Middlefield Road, Menlo Park, CA 94025 (415)329-4535.

**July 13-22, 1992.** *American Institute of Professional Geologists Annual Meeting.* To be held in Lake Tahoe, Nevada. Contact Jon Price, AIPG, P.O. Box 665, Carson City, NV 89702 (702)784-6691.

**August 10-14, 1992.** *Ground-water Pollution and Hydrology.* To be held in Princeton, New Jersey. Contact Omni Environmental Corporation, 3 Independence Way, Princeton, NJ 08540

**August 23-28, 1992.** *IBM-PC Applications in Ground Water Pollution and Hydrology: A Hands-On Short Course.* To be held in Princeton, New Jersey by NGWA.

**August 25-27, 1992.** *Microbial Processes in the Degradation of Ground Water Contaminants.* To be held in Portland, Maine by NGWA.

**August 28, 1992.** *Environmental Property Assessments (EPRA), One-Day Course.* To be held in Portland, Maine by NGWA.

**September 11-12, 1992.** *MGWA Fall Field Trip.* Details to be available this summer.

**September 15-18, 1992.** *Analysis and Design of Aquifer Tests.* To be held in Columbus, Ohio by NGWA.

**September 22 - 24, 1992.** *Understanding Migration, Assessment, and Remediation of Non-Aqueous Phase Liquids.* To be held in San Antonio, Texas by NGWA.

**September 25, 1992.** *Environmental Property Assessments (EPRA), One-Day Course.* To be held in San Antonio, Texas by NGWA.

**October 3-9, 1992.** *Association of Engineering Geologists Annual Meeting.* To be held in Long Beach, California. Contact John Byer, Kovacs-Byer, Inc., 11430 Ventura Blvd., Studio City, CA 91604 (818)980-0825.

**October 5-7, 1992.** *Capture-Zone Analysis for Contaminant Remediation and Wellhead Protection.* To be held in Burlington, Vermont by NGWA.

**October 17-22, 1992.** *Interdisciplinary Approaches In Hydrology and Hydrogeology.* To be held at the Red Lion Hotel - Columbia River in Portland, Oregon by AIH. Contact Helen Klose, American Institute of Hydrology, 3416 University Ave. SE, Minneapolis, MN 55414-3328 (612)379-1030.

**October 26-29, 1992.** *Geological Society of America Annual Meeting.* To be held in Cincinnati, Ohio. Contact GSA, Meetings Dept., P.O. Box 9140, Boulder, CO 80301 (303)447-2020.

**November 1-5, 1992.** *AWRA 28th Annual Conference & Symposium: Managing Water Resources During Global Change.* To be held in Reno, Nevada by AWRA.

**November 6-7, 1992.** *Environmental Education Conference: The Citizens, The Schools, The Environment.* Contact Pat Hutchinson, Minnesota Department of Education/Environmental Educa-

tion, 550 Cedar Street, St. Paul, Minnesota 55101.

**November 9-13, 1992.** *MODFLOW (USGS Modular Flow Model) for Simulation of Ground Water Flow and Advective Transport.* To be held in San Francisco, California by NGWA.

**November 10 - 12, 1992.** *Understanding Migration, Assessment, and Remediation of Non-Aqueous Phase Liquids.* To be held in San Francisco, California by NGWA.

**December 1-3, 1992.** *Corrective Action for Containing and Controlling Ground Water Contamination.* To be held in Orlando, Florida by NGWA.

**January 3-8, 1993.** *IBM-PC Applications in Ground Water Pollution and Hydrology: A Hands-On Short Course.* To be held in San Francisco, California by NGWA.

### More details available from:

For information about meetings and seminars to be held by the American Water Resources Association (AWRA), contact Michael C. Fink, AWRA, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192 (301)493-8600, Fax: (301)483-5844.

For information about meetings and seminars to be held by the National Ground Water Association (NGWA), formerly the National Water Well Association, contact NGWA at 6375 Riverside Drive, Dublin, Ohio 43017 (614) 761-1711.

For information about Short Courses held by the International Ground Water Modeling Center (IGWMC), contact the IGWMC, Institute for Ground Water Research and Education, Colorado School of Mines, Golden, Colorado 80401-1887. (303)273-3103, Fax (303)273-3278.

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## Virginia Studies its Septic System Rules

State regulations in Virginia now demand only a 2 to 3 inch separation between septic system drainfields and the water table. However, the Virginia Department of Health (VDH) is proposing new rules to increase the isolation distance.

In 1990, the state legislature passed a bill requiring the VDH to consider water resource protection as well as human health when revising septic system rules. Governor Douglas Wilder then appointed an agency-industry task force which recommended that drainfields in sandy soils be separated from the water table by 24 inches, and drainfields in other soils should be separated by 18 inches. A scientist from the Chesapeake Bay Foundation said the recommended separations are the "absolute minimum."

During the task force study, the VDH tested 159 potable supply wells in the Virginia Tidewater region for fecal coliform contamination. About 17 percent of wells were contaminated when only 2 inches separated the septic drainfields from the water table. Wells next to drainfields separated from the water table by 18 inches or more showed a 6.8 percent contamination rate. The VDH said that although septic effluent reaches ground water eventually, distance gives aerobic bacteria more opportunity to degrade fecal coliforms before the ground water is affected.

The task force recommended further evaluations of alternative septic systems, citing low-pressure systems which spread septic effluent more evenly over the drainfield area and can be used in areas with higher water tables. The VDH, which issues up to 30,000 septic system permits annually, expects to publish the proposed rules by the end of the year.

—*The Ground Water Newsletter*

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## Sonic Drilling Useful in Waste Cleanup

Sonic drilling is finding new lease on life in the U.S. Department of Energy's waste cleanup program. Harrison Western Mining Inc., Lakewood Colorado, has been testing the technology at three western DOE sites. Agency officials say it has allowed safer and faster work and produced better samples than classical cable tool drilling.

In sonic drilling, a metal pipe - usually 6 to 11 inches in diameter - is rotated as an oscillator simultaneously creates a resonance in the top of the pipe that performs the cutting action at the bottom. The technology eliminates the need for fluid or air circulation, and samples retrieved from the inside of the drill tube are not mixed with any outside substances. In addition, no time is lost installing and retrieving steel casing, and no contaminated drilling wastes are left over.

Sonic drilling is being used at the Idaho National Energy Laboratory (INEL) in Idaho Falls to sink a series of 20-foot sample bores in a 20,000 ft<sup>2</sup> acid pit at a former dump site for toxic and low-level radioactive waste. "Sonic drilling proved a good way to go since we got better sample recovery and no extra waste," says Doug Kuhns, project manager for EG&G Inc., INEL's operations and maintenance contractor. The technology also helped protect workers if the rig struck an unexpected "hot spot", since the pit's contents are unknown, he adds.

In addition, a remote control system was designed so the drill could be operated from a distance of 120 feet, and a drill string enclosure was developed to prevent toxics from escaping when samples were retrieved.

At Hanford Reservation in Richland, Washington, sonic drilling is being used to bore ground water monitoring wells. So far, 20 wells have been completed to a depth of 220 feet.

K. Michael Thompson, a DOE hydrologist, says the wells have

provided excellent sampling conditions and drilling time has been cut by a third. DOE is now studying whether to integrate sonic drilling into its overall cleanup program. By owning the drills and reusing them in the same zones, DOE would avoid having to pay for continual decontamination, reducing costs by 25 percent, says Thompson.

—*Engineering News Review*

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## To the Last Drop

### —A Board Game for Budding Hydrologists

Purdue University Cooperative Extension Service has created a water quality/conservation board game, "To the Last Drop", for upper elementary students. According to Susan Edinger, Extension Specialist, two to four students can learn about water conservation, pollution and the hydrologic cycle while playing the game. Edinger said, "The object of the game is to travel around the board two times without running out of Waterbucks. Each student starts with 100,000 gallons of water."

Each student selects a pawn, then rolls the die to travel through the game path. If the student lands on a water-use space (such as "using a washing machine - 35 gallons), waterbucks are paid to the bank. When a student's pawn lands on a water-saving space (such as "hand-washing dishes - save 10 gallons), waterbucks are paid to the student. Spaces labeled "take a Conservation Card" or "Water Trivia Card" contain cards which present an opportunity to save water (like how to get cold water from a faucet without letting the water run). The player collects or pays waterbucks.

To order the game, request publication number 4-H 778 and send a check for \$10 per game (payable to Purdue University) to Media Distribution Center, 301 South 2nd Street, Lafayette IN 47905-1092. For more information about the game, contact Susan Edinger at (317)494-8439.

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—continued from page 5

made more precise by dendro-chronological analysis of the tree rings on the planks. It is now possible to say that the oak trees were felled in 5303 B.C. exactly, probably in the autumn or winter. The well was built the following spring or fall.

—Nature

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The use of recycled paper for everything the Minnesota Ground Water Association sends out is a costly addition to our budget. It is, however, something many of our members consider important. The following 46 members gave a total of \$247 in addition to their dues. This amount is enough to cover the cost of paper for the directory for this year, plus some will be left over to pay for paper for flyers and for recycled paper envelopes. We are still soliciting donors (see page 2) who could help cover the cost of the paper for our newsletters.

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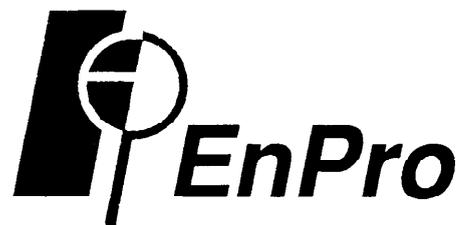
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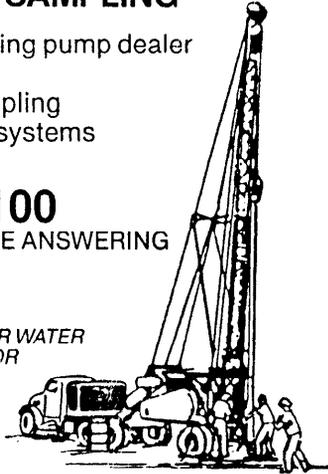
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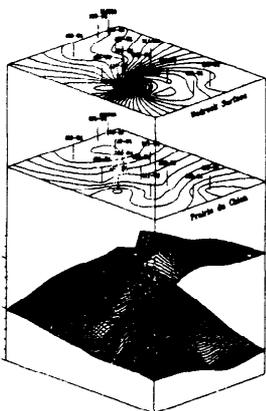
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