

MINNESOTA GROUND WATER ASSOCIATION

NEWSLETTER v. 1, n. 4 July 1983

The summer meeting is a special, if not unique session that I hope most of you will consider attending. The MGWA in cooperation with several very generous companies will present an all day seminar on drilling, sampling, and monitoring well installation. Details and agenda are inside. I guarantee that you will not find another seminar like this for the unbelievably low cost of \$10.00 (\$20.00 non-members). How did we manage that? We have only to thank Johnson Division - UOP Inc., Soil Exploration Co., Braun Environmental Labs, Geotechnical Engineering, Keys Well Drilling, and Stevens Well Drilling which have donated personnel, time and equipment for this seminar. There will be five drilling operations complete with crews actively drilling, sampling and installing monitoring wells. You will have the chance to ask questions, learn the advantages to using various methods, and see this equipment while in use. The instructors all are experienced in these methods and currently use their knowledge daily. This seminar is geared to anyone who knows next to nothing about the topics to those who have experience. I think most of you will find this event to be worth your time. Special thanks to Dave Kill, Bob Pendergast, Jerry Rick, Don Stormoe, Tom Stevens, George Keys, Roger Blomquist, Cameron Kruse, and Ron Thompson for willingly donating their time. I hope to see many of you at the seminar, please note that you must pre-register. Call me at 612/296-0431 if you have any questions.

We are slowly getting together program descriptions which will be used for soliciting funds for other seminars. Anyone interested in helping out, please call myself or any of the directors. The ground water modeling class is also beginning to gel, by the August 18th meeting I'll have more information on it.

This newsletter completes the first year of its publication and I wish to personally thank Pat Mayer for the many hours and energy she has put into it. I know Pat could use some help, so anyone who can type or has access to a word processor, give her a call at 612/725-4590. Thanks Pat. I also want to thank all of you for helping get this organization moving. Note, there are two director positions up for election this summer. A nominating committee chaired by Kelton Barr is drawing up a slate. If you have anyone in mind, call Kelton at 612/920-0655.

Gilbert Gabanski
President, MGWA

ELECTION OF MGWA OFFICERS FOR 1983-1985

One of the items of business for the upcoming meeting will be the nomination of officers to replace those whose terms are expiring in 1983. As you may be aware, MGWA officers serve for 2-year terms with the President, Vice President, and Secretary elected in even number years, and the Treasurer and Membership Chairman elected in odd number years. Consequently, elections will be held this fall for the offices of Treasurer and Membership Chairman.

These officers have the following functions. The Treasurer maintains the accounts of the Association which includes all financial transactions, dues information, tax statements, necessary reports to the State and Federal IRS, and funding information. The Membership Chairman is responsible for keeping a list of active members and prospective members for the mailings of the Association, including the newsletter.

A Nominating Committee has been named by the MGWA Board and is searching for candidates for these two positions. The slate of candidates chosen by the Nominating Committee will be presented to the Association at the next meeting. At that time, other nominations may be made from the floor. All candidates must agree to serve if elected (this is a hard working organization!). The officers will be elected by mail ballot completed before the subsequent annual business meeting.

If you have any suggestions for candidates, including yourself, please contact one of the members of the Nominating Committee (Dennis Woodward, U.S.G.S.; Kelton Barr, Barr Engineering Co.; Don Jakes, MPCA).

- Kelton Barr, Secretary

CURRENT GROUND WATER RESEARCH IN MINNESOTA *

Paleohydrology of the Holocene in West-Central Minnesota

Preliminary investigation of the lake sediments in western Minnesota has shown that many shallow lakes dried during the mid-Holocene, ca. 8,000 to 4,000 B.P. The elevations and carbon dates of dry horizons in the lake sediments provide ground water boundary conditions of known age. A steady-state ground water flow model can use these boundary conditions to estimate past levels of water flux through the system in order to obtain a quantitative estimate of precipitation minus evapotranspiration. A sand plain occupying the Wing River watershed around Parkers Prairie, Minnesota has been chosen for study. Several cores of lake sediments are being analyzed in order to locate dry horizons. At this time a potential-theory model is being constructed for the watershed.

Jim Almendinger (612) 373-2232

Department of Ecology, University of Minnesota, Minneapolis

Accelerated Ground Water Management Program

The Department of Natural Resources has proposed to the Legislative Commission on Minnesota Resources a two-year program to develop field methods for investigating ground water and to develop a plan for management, conservation and monitoring of a critical aquifer system. Each element of the program is summarized below.

Buried drift aquifers are the sole source of water for communities and for irrigation in the western third of the state. The extent and the hydrologic properties of the drift aquifers must be known for effective ground water management, but obtaining this information directly (by drilling) over large areas is prohibitively expensive. Therefore, geophysical methods including surface resistivity, seismic reflection and refraction will be used to obtain subsurface information and as a guide for selecting a limited number of drilling sites.

Aquifers in Swift County have been selected for water management analysis. Initially, an optimum yield for the aquifers will be determined. Then a variety of management techniques will be evaluated to determine their usefulness in maintaining the optimum water supply over the long term. Maintenance of the water supply is very important to the economic well being of the area: the value of irrigation to farm receipts is estimated at \$4.1 million annually and, on the average, an irrigated acre in the County provided \$309 in farm output compared to \$115 for dryland farming. (1978 data from the University of Minnesota)

Patricia Bloomgren (612) 296-0436

Minnesota Department of Natural Resources, Division of Waters

* Due to an oversight, this material was left out of the Research section of the April MGWA Newsletter.

RECENT PUBLICATIONS of interest to our members

The Scientist and Engineer in Court (Water Resources Monograph 8)

Michael D. Bradley (1983)

Explains the duties of the expert witness, seeks to familiarize the newcomer to courtroom procedures, legal jargon, etc; examples are given from the fields of hydrology and water law.

\$14.00 (30% discount to AGU members) from American Geophysical Union, 2000 Florida Avenue N.W., Washington D.C. 20009 or call 800-424-2488.

(Advertised in recent editions of EOS)

Proceedings of the Sixth National Ground-Water Quality Symposium Atlanta, Georgia held September 22-24, 1982

Includes 41 papers addressing the needs of regional, state, county and municipal jurisdictions in ground water protection. Sample topics - Developing a comprehensive ground water management program; Best management practices for avoiding ground water contamination problems; Overcoming institutional barriers to ground water management; State policy and tools for managing and protecting ground water.

\$25.00 from National Water Well Association, 500 West Wilson Bridge Road, Worthington, Ohio 43085.

William Mitchell Environmental Law Journal, Volume 1, May 1983

The purpose of this new regional law journal is to explore current Minnesota and Midwestern environmental issues and to prompt the exchange of legal and scientific information.

Published annually, \$6.00 to institutions and individuals, \$4.00 to law students, Minnesota residents add 6% sales tax, from William Mitchell College of Law, 875 Summit Avenue, St. Paul, Minnesota 55105.

Fiscal Constraints on Minnesota - Impacts and Policies

Budget Cuts and Environmental Programs, by Nancy Walters

This report, written in the summer of 1982, explains how environmental programs in Minnesota were affected by recent state and federal budget cuts and indicates how programs may be affected by additional funding reductions. Available from: Center for Urban and Regional Affairs, 313 Walter Library, 117 Pleasant Street S.E. University of Minnesota, Minneapolis, Minnesota 55455 (612) 373-7833.

Minnesota Environmental Organizations: a Directory - contains information on more than 225 citizen and professional groups in the state, including a list of government agencies, a list of inactive and defunct organizations, and a bibliography of other directories. Available from: The Minneapolis Public Library and Information Center, 300 Nicollet Mall, Minneapolis, Minnesota 55401. The price is \$5.00 plus \$1.00 for handling/postage.

Water Use in the Twin Cities Area, by Gary Oberts and Water Conservation in the Twin Cities Metropolitan Area, by Zachary Hansen are available from: Metropolitan Council of the Twin Cities Area, 300 Metro Square Building, 7th and Robert Streets, St. Paul, Minnesota 55101 (612) 291-6359.

A recent WELL LOG (June 30, 1983, Vol. 14, No. 4) contains a 10 page catalog of publications available through the National Water Well Association. Among the 145 items listed are texts, manuals, conference proceedings, booklet anthologies, public information pamphlets, brochures and leaflets, legal and business information, NWWA membership information, correspondence courses, slide presentations, films and video tapes, and journal subscriptions. The catalog is also available from NWWA (P.O. Box 16737, Columbus, OH 43216) and is free.

Superfund/victims' compensation

Chapter 121

HF76*—Long, Munger, Simoneau, Sieben
SF220—Merriam, R. Moe, Pehler, C. Peterson, Laidig

Establishes an environmental response, compensation and compliance fund to pay for the clean-up and removal of hazardous wastes in the environment; defines who is responsible for release of a hazardous substance, pollutant or contaminant; holds person responsible for the release of a hazardous substance, with certain exceptions, strictly (without regard to negligence), jointly and severally for costs of removal and harm to natural resources; holds person responsible for the release of a hazardous substance, with certain exceptions, strictly, jointly and severally liable for economic loss, death, personal injury and disease which resulted from the release; provides for retroactive liability for personal injury to 1960, or 1973 if storage of the hazardous substance was not an abnormally dangerous activity; provides an easier method for a person claiming injury due to a release to prove the release caused the injury; allows jury to determine each party's share of liability when several parties are liable for clean-up costs or harm to natural resources;

allows jury to compare fault of parties involved for purposes of dividing costs, but limits the amount of liability of each defendant to two times the amount of their fault in personal injury cases; sets a six year statute of limitations for making damage claims; provides that liability sections do not apply to the release of hazardous substances which took place entirely before July 1, 1983; prohibits disturbing a closed facility where hazardous waste remains, and requires landowners who know that property was a waste disposal site to file with the county recorder;

allows the Pollution Control Agency (PCA) to take any removal or remedial action when there is a hazardous waste release or threat of release to protect public health, welfare or environment; prescribes powers and duties of the PCA regarding hazardous wastes; allows the PCA to recover for carrying out its clean-up duties in civil action against the responsible party; provides for other civil remedies against people who fail to take clean-up action; lists projects which "superfund" money will go toward, including PCA response actions, alternative water supplies, compensating a community for a hazardous waste site, restoring natural resources, and PCA expenses in monitoring facility compliance with state law; imposes taxes on hazardous waste generators to help finance the "superfund"; establishes hazardous waste generator fees and facility permit fees to provide PCA with money to enforce hazardous waste laws; places a cap on municipal liability; requires a study on the creation of a victim compensation fund for people who suffer injury due to the release of hazardous wastes, and who won't get other compensation; requires a study on insurance against liability for personal injury; appropriates \$5 million to the state "superfund".

effective: various effective dates

Peat mining permits, reclamation

Chapter 270

HF733—Munger, Battaglia, Beard, D. Carlson, Krueger
SF238*—Diessner, DeCramer, Anderson, Merriam, Isackson

Includes peat mining in the mineland reclamation act; requires a person who commercially removes peat to obtain a permit from the commissioner of natural resources; allows commissioner to exempt from permit a person who mines less than 40 acres, upon finding that the mining would not cause significant effects; requires commissioner to adopt rules to regulate peat mining and reclamation by July 1, 1985, and delays peat mining permit requirement until 180 days after effective date of rules.

effective: day after enactment

Radioactive waste compact

XXXX

HF524—Kahn, K. Nelson, Long, D. Carlson, Ogren
SF511*—Pehler, Merriam, Benson, Luther, Davis

Enters Minnesota as a member of the Midwest Interstate Low-Level Radioactive Waste Compact; describes the activities of party states to the compact; designates the director of the Pollution Control Agency as Minnesota's voting member of the interstate commission; requires the PCA director to report at least semi-annually to the governor and the Legislature; allows the PCA to assess waste generators for the costs of compact membership and obligations; sets civil and criminal penalties for violation of compact provisions; allows courts to compel or enjoin performance of activities related to low-level waste; allows the attorney general to enforce decisions of the commission, to appeal decisions or bring legal action against other compact states;

specifies that state retains right to enforce laws and rules relating to environmental review, facility siting, and public health protection; creates an advisory committee of legislators and department heads, which could appoint a technical task force; requires the PCA director to notify the governor, Legislature and advisory committee if the compact states choose Minnesota as a host state; requires the advisory committee to recommend whether Minnesota should withdraw from the compact if the compact chooses it as host state, and specifies that Legislature intends that the governor call a special session, if necessary, to act on advisory committee recommendation to withdraw from compact; requires PCA to develop siting process, and other guidelines, if Minnesota is to be the host state; exempts siting of such a facility from radioactive waste management statutes; appropriates \$75,000 for membership dues and expenses.

effective: Aug. 1, 1983

Waste management—changes

XXXX

HF1074—Long, D. Nelson, Evans, Segal, R. Anderson
SF1012*—Merriam, Pehler, Laidig, Schmitz, Ramstad

Makes changes to the Waste Management Act of 1980 to conform to federal requirements; prescribes criminal and civil penalties for violations of hazardous waste laws; subjects decisions of the Waste Management Board (WMB) on disposal facilities to Pollution Control Agency (PCA) review; delays final decisions on certification of need for disposal; separates WMB environmental studies and decisions on disposal sites, operators and facilities from PCA environmental studies and decisions on permits; emphasizes the importance of the hazardous waste management plan and certification of need for disposal, and extends the time for their development; allows the WMB to evaluate bedrock disposal technology and sites, and preserve the participation of affected localities in planning and decisions; clarifies the purposes of local participation in planning and disposal decisions; eliminates some deadlines, and replaces others;

clarifies the relationship between the WMB and potential facility operators; clarifies when solid waste incineration facilities without resource recovery are eligible for assistance; clarifies organization of waste management districts; exempts recycled wastes from flow control; extends, replaces, and eliminates deadlines in the metropolitan area; reduces the number of sludge ash candidate sites and emphasizes alternatives to ash disposal; eliminates the requirement for demolition debris sites; clarifies the purpose, scope, and responsible governmental units for environmental impact statements on solid waste and sludge ash disposal sites; separates environmental studies and decisions on disposal sites from later environmental studies and decisions on permits; clarifies the purpose of certificates of need for sludge ash and solid waste disposal.

effective: various effective dates

Session Summary reports all bills that passed both the House and the Senate during the 1983 legislative session. If you would like a copy of a bill in the Summary, call the

Chief Clerk's Office, (612) 296-2314 and ask for a copy by Chapter number, or by House file or Senate file number, if no chapter number appears.

DRILLING, SAMPLING, AND MONITORING WELL INSTALLATION

ATTENTION: For all you desk-jockey hydrologists, managers, thinkers, and interested members--did you ever wonder how cable tool drilling was different from rotary drilling, and under what circumstances each was preferred? Do you know what split-spoon and Shelby-tube sampling techniques are? What is the best way to choose and install a monitoring well for your specific need? These and other questions will be answered (be sure to bring your own to be answered) at our summer meeting. Agenda and location map are enclosed in this newsletter; and the registration form is attached below. Registration fee is \$10.00 per person (this covers refreshments during the scheduled breaks, box lunch, and handouts). The seminar is open to non-members for \$20.00. Only the first 100 registrants can attend, so fill out the form and mail back to: MGWA Drilling Seminar, P.O. Box 3362, St. Paul, MN 55165, with a check for the fee. The afternoon session will be spent in the "field", so wear appropriate clothing. Any questions, call Gil Gabanski (612/296-0431) or Dennis Woodward (612/725-7843).

Reserve a spot for me at the Drilling, Sampling, and Monitoring Well Installation seminar on August 18, 1983, at Johnson Screens, St. Paul, Minnesota. Enclosed is a check to cover the registration fee.

NAME _____ TEL NO. _____

ADDRESS _____

Tear this off and send in to confirm your registration.

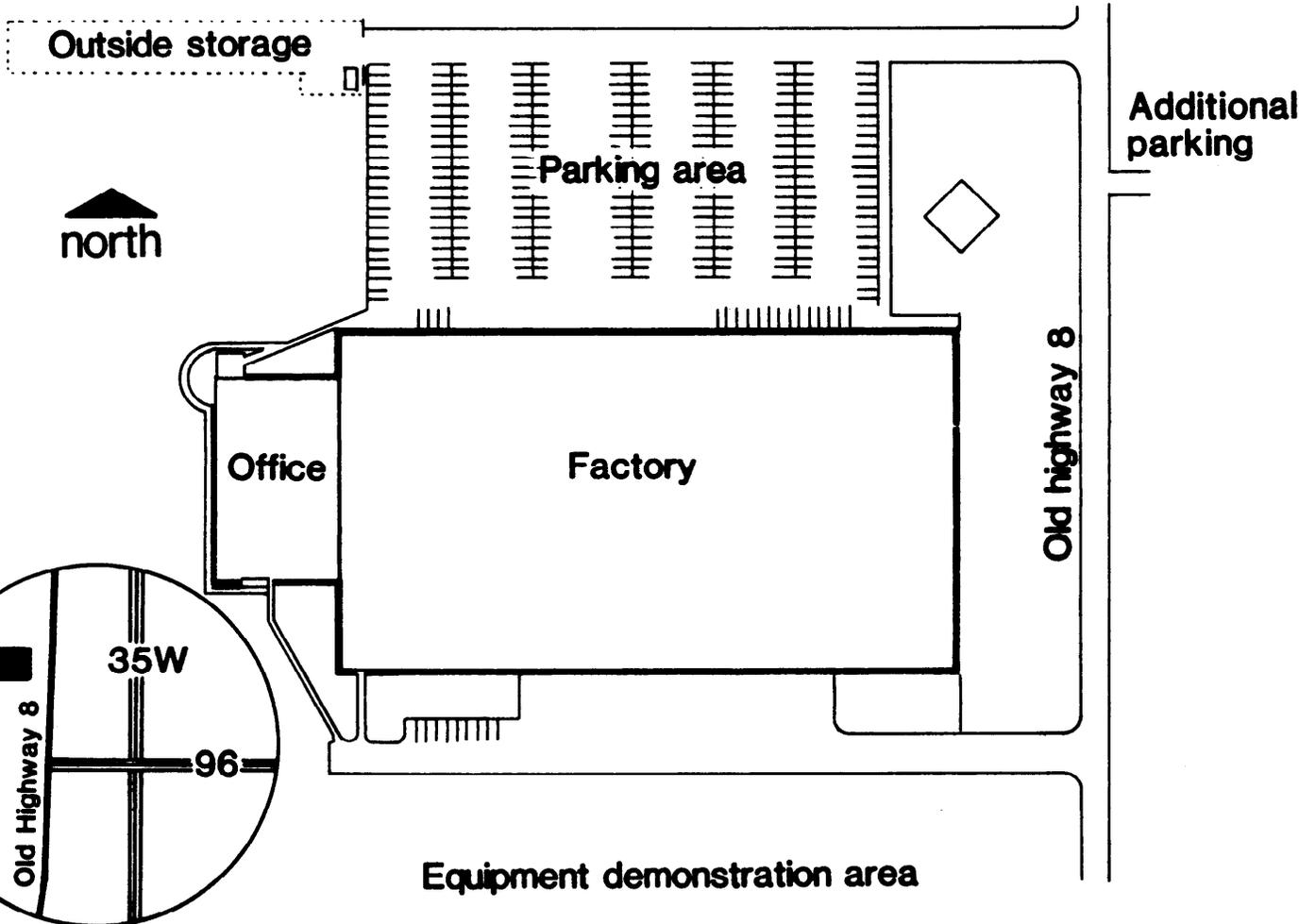
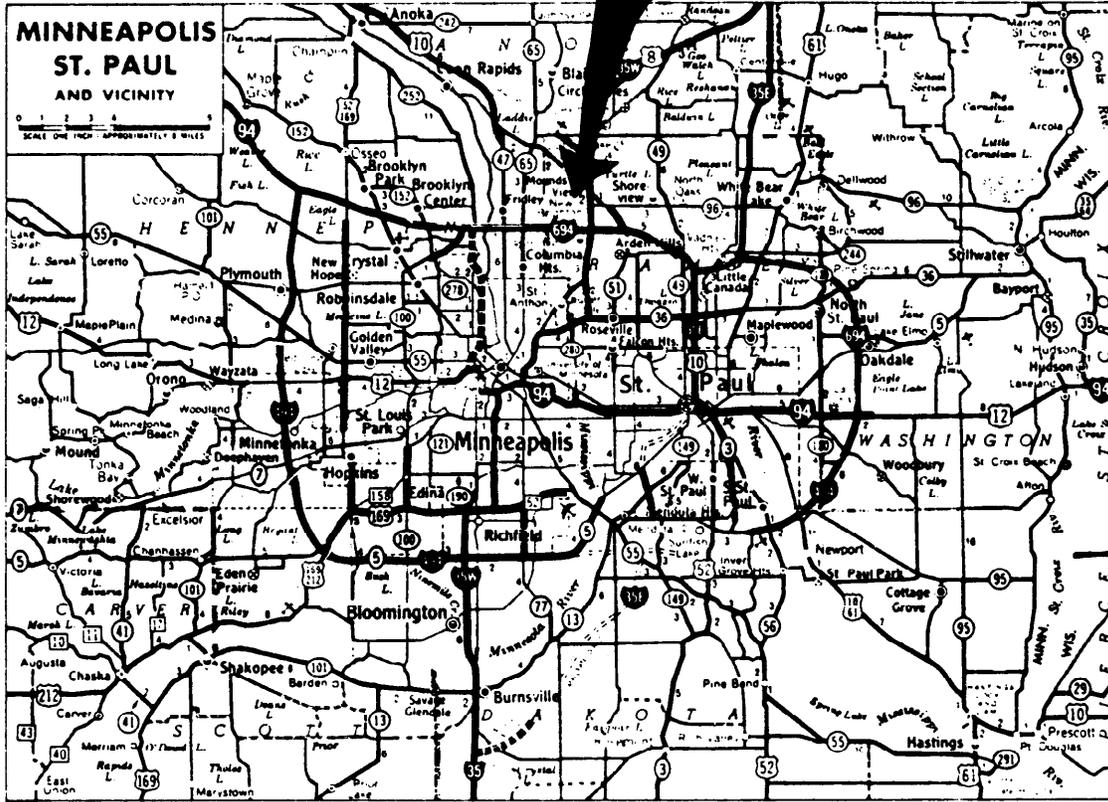
MINNESOTA GROUND WATER ASSOCIATION
Summer Meeting, August 18, 1983
Johnson Screens
1950 Old Hwy. 8, New Brighton

DRILLING, SAMPLING, AND MONITORING WELL INSTALLATION

- | | | |
|------------|--|--|
| 8:30 a.m. | Welcome and Introduction | Dennis Woodward |
| 8:35 | Drilling and Sampling Techniques | Tom Stevens
Stevens Well Drilling Co.
Don Stormoe
Soil Exploration Co. |
| 9:35 | Short Description of Field Demonstrations | Bob Pendergast
Geotechnical Engineering Corp.
Cameron Kruse
Braun Environmental Labs
George Keys
Keys Well Drilling
Tom Stevens
Stevens Well Drilling |
| 9:55 | Break | |
| 10:15 | Drilling Fluids and Well Construction Products | Dave Kill
Johnson Screens |
| 10:55 | Monitoring Well Installation | Jerry Rick
Soil Exploration Co. |
| 11:30 | Monitoring Well Code | Ron Thompson
MN Dept. of Health |
| 11:45 | Lunch - Provided on Premises | |
| 12:30 p.m. | Aquifer Test Demonstration | Dave Kill
Johnson Screens |
| 1:00 | Drilling and sampling equipment demonstrations:
(Afternoon refreshments provided) | |
| | 1) Hollow-stem auger drilling; split-spoon sampling | Bob Pendergast, Geotechnical Eng. Corp. |
| | 2) Auger drilling; sampling with a Shelby tube. | Cameron Kruse, Braun Environmental Labs |
| | 3) Rotary drilling; sampling with drilling fluids. | Tom Stevens, Stevens Well Drilling Co. |
| | 4) Cable tool drilling; sampling | George Keys, Keys Well Drilling Co. |
| | 5) Monitoring Well Installation | Jerry Rick, Soil Exploration Co. |
| 4:30 | Adjourn | |

Morning session is inside the Johnson Screens office building, and the afternoon session is outside, just south of the office building.

Johnson Division
1950 Old Highway 8
UOP Inc.



CONJUNCTIVE SURFACE-GROUND WATER SIMULATION

Appropriate decisions for development of water resources or changes in its management depend upon comprehensive knowledge of basinwide impacts. Responses in the entire water system to physical changes in any of its components need to be predicted. The questions are straightforward, but for complex systems the answers are not obtained easily. A good example is the system of interconnected surface and ground waters in the alluvium of the South Platte River Basin.

What is needed is a computer model capable of day-by-day simulation of the complex surface-ground water system over the area of an entire basin. Recognizing in 1972 that the existing state-of-the-art was inadequate, the Colorado Water Resources Research Institute initiated a hydrologic simulation technology development program. It was apparent that traditional numerical models could not handle on a cost-effective basis the almost infinite number of combinations of decision variables (pumping from hundreds of wells, releases from dozens of reservoirs, etc.). The strictly numerical procedures are just too costly. This is where a return to the classical mathematics of boundary value problems proved fruitful. Out of this approach has come a cost-effective simulation technology capable of handling the entire South Platte River Basin using a grid of 1 mile square and a daily time scale. In concept the ground water simulator (numerical) is replaced by an analytical function simulator. This approach requires that all aspects (hydrologic, legal, agronomic) and their interactions be described by physically-based explicit relations. The new technology is, then, a combination of analytical and numerical methods utilizing the advantages of each.

The new model has been successfully used to evaluate the impact of ground water pumping upon surface water rights in the lower 100 miles of the South Platte Basin. The augmentation plan of the Groundwater Appropriators of the South Platte, Inc. (GASP) was evaluated by determining the weekly flow in the river at each of 39 surface diversion points during a 20-week irrigation season with and without pumping for each of 10 years simulated. The difference in river flow at each point represents the impact of pumping on surface water rights, and is the amount of flow augmentation which should be supplied to compensate surface priority rights.

A report describing the model is available from the Institute. Order CR 112 from Bulletin Room, Colorado State University, Fort Collins, Colorado, 80523, \$3.00.

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MGWA Newsletter Advertising Rate

At the MGWA Directors Meeting held on June 13, 1983, the Board voted to increase the advertising rate. For Water Year 1984 (October 83 - September 84) the cost is \$40.00 per year (\$10.00 per quarterly Newsletter) for a 2" x 3 1/2" space.

RECAP OF SPRING MEETING

Our guest speaker for the spring meeting was Dr. Mary Anderson, Associate Professor of Geology at University of Wisconsin. Dr. Anderson's presentation, "Ground Water Modeling: Is it true that the Emperor has no clothes?", focused on the recent proliferation of modeling studies and a growing concern over the lack of certainty in the parameters needed as input to the model. Her argument was that in some cases, the model "has no clothes" and it is up to the modeler to truly "dress up" the model. Dr. Anderson discussed types of models with examples for each type, use of these models, and the general philosophy of modeling. Dr. Anderson concluded by stating that "models should not be used as absolute predictive tools" and that "modeling is a framework for thinking about a system." Dr. Anderson referred to several publications which are listed below for those who expressed interest in them. Approximately 65 people attended the meeting. Thanks.

Faust, C.R., L.R. Silka, and J.W. Mercer, 1981, Computer modeling and ground-water protection: Ground Water, v. 19, no. 4, p. 363-365.

Hamilton, D., 1982, Groundwater Modeling: Selection, Testing and Use: Task 20, Groundwater Management Strategy for Michigan, Water Management Division, Michigan Dept. of Natural Resources, 2 vols..

Jorgensen, D.G., 1981, Geohydrologic models of the Houston District, Texas: Ground Water, v. 19, no. 4, p. 418-428.

Lehr, J., 1979, Mathematical ground-water models may be intellectual toys today, but they should be useful tools tomorrow: Ground Water, v. 17, no. 5, p. 418-422.

Lewis, B.D., and F.J. Goldstein, 1983, Evaluation of a predictive groundwater solute transport model at the Idaho National Engineering Laboratory, Idaho: U.S.G.S. Water Resource Investigation 82-25, 71 p.

National Water Well Association Coming Conferences

NWWA Ground Water Technology Division Education Session, September 13-14, 1983, St. Louis, Missouri; Ground Water and Law Conference, October 5, 1983, Columbus, Ohio; NWWA Regional Conferences on Ground Water Management, Western Conference: October 25-26, 1983, San Diego, California, Eastern Conference: November 1-2, 1983, Orlando, Florida; Ground Water Investigations at Hazardous Waste Sites: Safety and Liability Considerations, October 27-28, 1983, San Diego, California; Water Well Design Course for Consultants, November 30-December 2, 1983, Columbus, Ohio; Conference on Vadose Zone Processes, December 8-9, 1983, Las Vegas, Nevada; Safety and Hazardous Waste Disposal Sites Conference, January 16-17, 1984, Columbus, Ohio; Surface and Borehole Geophysics Conference, February 7-8, 1984, San Antonio, Texas; The Second National Symposium and Exposition on Ground Water Instrumentation, April 1-4, 1984, Las Vegas, Nevada; The Sixth Annual Ground Water Heat Pump Conference, April 9-11, 1984, Columbus, Ohio; The Fourth National Symposium and Exposition on Aquifer Restoration and Ground Water Monitoring, May 23-25, 1984, Columbus, Ohio.

For information: National Water Well Association, 500 West Wilson Bridge Road, Worthington, Ohio 43085, (614) 846-9355.



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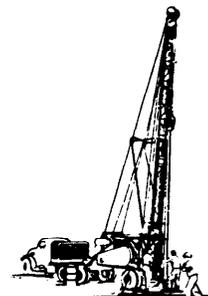
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ENVIRONMENTAL STUDIES

MINELAND RECLAMATION

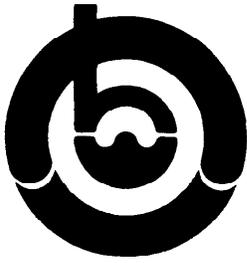
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