

Minnesota Ground Water Association

Volume 7, Number 4: December, 1988

President's Page

by Linda L. Lehman

With the holiday spirit in the air, often our thoughts turn to those of us who are less fortunate than ourselves. That certainly happened to me this season. As I watched the Today Show one morning a few weeks ago, Jane Pauley interviewed a woman who was a victim of the Armenian Earthquake. This woman had lost her husband and son. She said she needed help. I was so touched by her words that I knew I must do something to help these people. Then a few minutes later, I realized what could be done. So, I have set about this task. My idea was to organize all of our national ground water associations to raise money to be dedicated to rehabilitating the Armenian water supplies. So far, I have spoken with about ten other organization presidents, and there has been a willingness to go along. Of course, many must clear donations with their Executive Boards. I will continue calling all the organizations (list provided by Jay Lehr, NWWA) for contributions which will be given to the Soviet Government either through the Western Bank of St. Paul or the American Red Cross. Both of these organizations have assured me that the donations can be dedicated to water supply rehabilitation.

We are shooting for mid-January to have the money ready to go. What I would like to have accompany the donation is a map of the U.S. showing the locations of each contributor to the fund along with the names of the contributor, so that the Soviet Government can see how willing private U.S. organizations are to help out people in need -- regardless of political beliefs.

If any of you would like to personally contribute, please call me for details.

Siting Plans for a Low-Level Radioactive Waste Disposal Facility in the Midwest Compact Region

by Mark Larson and Linda Lehman, L. Lehman & Associates

Federal legislation passed in 1980 and amended in 1985 charged the states with the responsibility for managing and disposing of commercial low-level radioactive waste. In response to this legislation, the seven-state Midwest Compact (comprised of the states of Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin) was formed in order to address the responsibilities of Federal law. Within the Midwest Compact, Michigan was selected to be the initial host state for a 20-year period to serve the needs of the Midwest Compact, if it is determined that a containment facility can be safely located in the State of Michigan.

Also, the State Legislature in Michigan, in 1987, created the Michigan Low-Level Radioactive Waste Authority (Authority) to determine, through an open and participatory public process, if it would be possible to site, develop, and operate the containment facility in this State. Sensitive not only to the social responsibility of all citizens on the matter of safe management of low-level radioactive waste, but also to concerns of citizens about their quality of life, the State of Michigan developed, and strictly adheres to, the following policy position with respect to this issue:

"The mission of the Authority is to meet the State's responsibilities under Federal and State law for the

containment of low-level radioactive wastes while making certain that:

- (1) the public health and the environment are safeguarded before such a facility is constructed;
- (2) all costs associated with development of such a facility will be borne by those generating low-level radioactive wastes; and
- (3) the decision-making process be accomplished in an open and participatory manner that assures equal access to all Michigan citizens."

The Michigan Siting Plan describes, in general terms, the decision-making process for site selection that will guide the Authority in addressing its responsibilities under Federal and State law. As this decision-making process moves forward over the next several months, the Authority will develop and disseminate to the public additional documents to explain and describe, in more detail, the individual phases of the process. There will be oppor-

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tunities for continuous and consistent public participation.

The first phase of the decision-making process is the State-wide exclusionary screen. This screen, the results of which will be available by February 15, 1989, will exclude large areas within the State based on a variety of safety and environmental protection-related technical criteria pertinent to low-level waste containment. The remaining areas will be designated as suitable, though they will be scrutinized to determine if such a facility is feasible for development in Michigan. Following the announcement of these areas, the Authority will be meeting with citizens in these suitable areas.

The second phase of the process concerns the designation of candidate areas from the available suitable areas. This phase will be important to the Authority to determine if a containment facility can be acceptable to citizens, by satisfactorily addressing all aspects of the Authority's mission statement

noted above. Thus, the selection of candidate areas will be based on criteria that improve the likelihood of such acceptability. These criteria are: amount of available land, availability of public land, and volunteer areas. This phase should be completed by August 1, 1989.

Phase three of this process will identify three candidate sites from the candidate areas. This selection will utilize technical favorability criteria and considerations related to public acceptability and is expected to be completed by January 1, 1990.

Phase four will consist of detailed site characterization activities. These activities will be undertaken at the three candidate sites in order to provide information necessary to support the designation of one preferred site from the three candidate sites.

Phase five of the decision-making process is the selection of the preferred site. This selection will be based on information gained during site characterization and

preliminary performance assessments. Following the selection of a preferred site, which must be submitted to the legislature according to provisions of Act 204 (P.A. 1987), the Authority would then prepare a license application to operate the containment facility. The application would be submitted about July 1, 1991, to the Michigan Departments of Public Health and Natural Resources, and the U.S. Nuclear Regulatory Commission. If after appropriate reviews, the application demonstrates that the facility complies with all applicable public health and environmental regulations, a license will be issued to the Authority to begin construction and operation. The public involvement program will continue throughout the site selection process, and is considered by the Authority to be of extreme importance. As part of this program, the Authority will be providing information to the public regarding benefits and incentives for communities interested in volunteering to host the facility.

NWWA Short Courses can be used for academic credit.

The Association of Ground Water Scientists and Engineers of the National Water Well Association has teamed up with the Ohio State University to establish a credential program in ground water science.

To earn the Credential, applications must complete within three years a minimum of five NWWA/AGWSE short courses that have been approved by Ohio State. At least two of these must be chosen from four designated "core courses" These core courses carry one hour of undergraduate or graduate credit, depending on the applicant's previous education. They are taught during academic breaks in Columbus or other Ohio cities.

Ohio State reviews each application, accepts candidates into the program, and determines whether they are eligible to earn undergraduate or graduate credit

for core courses. Applicants pay a \$500 application fee, which includes the academic fees for the two required core courses. The application fee is in addition to the standard registration fee charged for each NWWA/AGWSE short course.

Core courses (at least two):

- Principles of Ground Water Hydrology
- Introduction to Ground Water Geochemistry
- Design and Analysis of Aquifer Tests
- Theory and Practice of Ground Water Monitoring and Sampling

Other Approved Courses (at least three):

- Theory and Application of Surface Geophysics to Ground Water Investigations
- Theory and Application of Borehole Geophysics to Ground Water Problems
- Theory and Application of Contaminant Transport Modeling
- Treatment Technology for Contaminated Ground Water

- ✓ Theory and Application of Vadose Zone Monitoring and Sampling
- Corrective Action for Containing and Controlling Ground Water Contamination
- Microbial Processes in the Degradation of Ground Water Contaminants
- Applications of Environmental Isotopes to Practical Ground Water Studies

Approved courses taken in 1988 and 1987 may be used retroactively toward the credential.

For further information contact the OSU/NWWA Credential Program, 6375 Riverside Drive, Dublin Ohio 43017 (614) 761-1711.

Soak it up

A note in Groundwater Newsletter reports that a "designer clay" has been developed at Michigan State University which can be engineered to absorb neutral organic molecules. Used as a landfill liner, the material could both retard and collect contaminants (*Groundwater Newsletter 17(17)*).

LUST in the DUST:

The story of Minnesota's efforts for preventing and responding to Leaking Underground Storage Tanks

by Steve Lee and John Aho

Storage tanks which have silently corroded, or whose piping connections are loose or broken, or tanks which have been mechanically damaged are leaking petroleum in thousands of locations in Minnesota. Petroleum on the loose from these tanks is on the move below ground, creating fire and explosion hazards in sewers and structures, polluting soil and ground water, and creating major cleanup headaches and expenses for tank owners and victims.

The Minnesota Pollution Control Agency (MPCA), Tanks and Spills Section, regulates construction, operation, and cleanup of leaks from underground and above ground petroleum tanks. Because tank owners are required to notify the MPCA about most underground tanks, reasonably accurate statistics are available:

- 32,681 underground tanks at 12,023 locations
- 30% Retail Gasoline
14% Industrial
11% Schools
6% Government
39% Other
- 47% 20 years old or unknown age
- 88% bare steel or coated steel
4% Fiberglass reinforced plastic
0.2% Double Wall
8% Other

A high percentage of old tanks are not protected from corrosion or have been carelessly operated or maintained. A general observation that most tank removals uncover evidence of leakage or spills is warranted.

The Tanks and Spills Section staff numbers thirty-two (including six hydrologists, one engineer, fourteen enforcement staff, and two

program development specialists). The tank effort is broadly broken into the regulatory (leak prevention) effort, and the leak response or leaking underground storage tank (LUST) effort. Incidentally, while the LUST program acronym implies a focus on *underground* tanks, much of Minnesota's program also covers aboveground storage tanks which are exempt from the federal program.

Minnesota law effective in 1985 prohibits installation of unprotected tanks and requires most underground tank owners to notify the MPCA of their tanks and changes in their tanks' status. Federal regulations effective December 22, 1988, (published in the September 23, 1988, *Federal Register*) establish technical standards for new tank installations and establish a schedule for old tanks to be upgraded or removed.

NEW Tanks

- Must be protected from corrosion;
- Must have spill/overfill protection; and
- must be equipped with a leak detection system.

EXISTING Tanks

- Must have corrosion protection by December 1998;
- Must have spill/overfill protection by December 1998; and
- Must have leak detection system in place by December 1989 to December 1993, depending upon tank age.

Tank owners will also be required by federal law to show that they can pay for expensive leak cleanups. They can do this by holding insurance, letters of credit, self insuring, or otherwise demonstrating financial ability at a level of \$500,000, or \$1,000,000 for retail outlets. Copies of the federal regulations are available from the RCRA hotline, 1-800-424-9346. Also ask for pamphlets such as *Musts for UST's*.

State rules, which will incorporate (and we hope clarify and improve much of the federal regulations) will be established during 1989. Another state rule in 1989 will require that persons installing,

repairing, or removing a tank in Minnesota demonstrate competence through a certification program. Assuring proper tank installation will be a priority for our program.

Another state law, in effect since 1964, requires that aboveground liquid storage tanks have adequate safeguards against spillage and leakage and requires permits for their operation. We hope to revamp this permit program during 1989.

Minnesota received the nation's first grant of funds from the federal LUST TRUST for staff and contracts to react to leaking tanks. Companion state legislation (Minn. Stat. ch. 115C) rounds out federal authorities and funds by covering aboveground tanks and other federally exempt tanks and establishes a reimbursement program for cooperative owners or operators of leaking tanks. The Tanks and Spills Section is aware of over 800 sites where petroleum tanks have leaked, and is learning of more at a rate of hundreds of sites per year. Geographically these leaksites generally reflect population; approximately one-half are in the metro area.

State and federal tank law have as cornerstones the concept that the tank owner and operator must pay for problems caused by a tank. Minnesota law defines these responsible persons (RP's) as:

"a person who is an owner or operator of the tank at any time during or after the release" (leak).

Note that this RP definition hinges on tank (not land) ownership, and that RP status can reach back through several changes in land and tank ownership.

The huge number of leaksites under review by MPCA staff requires streamlined procedures. Persons discovering or suspecting leaks from a tank must report to the MPCA via telephone at (612) 296-8100. We believe, incidentally, that under many circumstances a consultant or contractor may also be responsible for notifying. The caller is given initial instructions by the Spills staff, and sent a "standard

Continued on next page

letter" describing investigation and cleanup responsibilities.

RP's are asked to commit to an investigation and cleanup schedule. The Tanks and Spills Section staff track and review investigation and corrective action plans and implementation. While much of this tracking is by necessity done on a trust basis, effective enforcement tools such as executive orders and penalties are available if cooperation is not forthcoming or bad faith is encountered.

A cooperative RP who properly notified the MPCA of tanks and leaks, and who cleaned up the site to requirements can apply to the Petroleum Tank Release Compensation Board (Petro Board) for partial reimbursement of cleanup expenses. The Petro Board is made up of representatives of the petroleum and insurance industries, the MPCA and Minnesota Department of Commerce. The reimbursement is for 75 Percent of most cleanup expenses between \$10,000 and \$100,000. In establishing this program, the legislature hoped to encourage insurance availability for those costs less than \$10,000 and greater than \$100,000. The reimbursement program is just getting underway, but as of December 1988, 10 reimbursements have been made, totaling over \$300,000. Several reimbursements have been denied because cleanup progress was not yet adequate; because the RP did not quickly investigate and confirm a suspected leaker; or because an RP had not obtained a permit for an aboveground tank. We believe that the reimbursement program provides a tremendous incentive for RP's to fulfill their legal obligations completely and quickly. Details of the reimbursement program can be obtained from the Department of Commerce at (612) 297-3238.

If the RP for a tank leak is unwilling/unable to act, the MPCA Commissioner can issue an Executive Order. If the order is not obeyed, or if the RP is unknown, Tanks and Spills Section staff can move ahead with the investigation or cleanup using state or federal dollars. Thus far, 17 orders have been issued. MPCA contractors have worked on

more than 25 sites. Many of these sites are emergency situations where the presence of explosive vapors or polluted well water necessitates prompt action. Of course, if tax money is spent at a site, it will be recovered from RP's to the extent possible.

Cleanup levels are established on a site by site basis. Certain steps are always required (free product removal, vapor control, etc.). Drinking water quality is the usual target for ground water cleanup. Consultants and RP's are encouraged to discuss cleanup goals with MPCA staff.

Federal regulations require that the MPCA be given 30 days prior notice of tank "closure" (removal or filling in place) except if it is being done because of discovery of a leak. These regulations also specify that industry standards for safe tank removal (purging or inerting explosive tank atmospheres, for example) be followed. We plan to make safe closure a priority item through the tank remover certification and enforcement programs.

We receive a large number of requests concerning tanks on property about to be sold or developed. The cases which involve known leaks are dealt with like other leak sites. Other site assessments and file review requests are handled as we can get to them. We sympathize with developers and others who sometimes cause themselves anguish by neglecting site contamination until closing day or construction. This often delays sale or development. Developers and purchasers should investigate sales ahead of time.

In summary, we think the tank program is off to a good start. We must continue to simplify our review and enforcement procedures while assuring adequate leak prevention and cleanup. We will be working hard in 1989 on technical rule development and enforcement; soil treatment/disposal procedures; air quality concerns and water discharge procedures; and development of fact sheets and policies on required analyses, minimal content of investigations and corrective actions plans, and on other aspects of the tank program.

If you have questions about our program, you may call:

(612) 297-2343 or **296-7335** for tank rule development questions
(612) 296-7311 for hydrology/geology questions, ask for a tank hydrologist
(612) 296-7311 for enforcement procedure questions, ask for a Project Leader or a "Tank PCS"
(612) 297-3238 for reimbursement questions, ask for Ms. Heidi Almquist of the Department of Commerce.

Copies of the Federal rule developed by the new EPA Office of Underground Storage Tanks can be obtained for \$1.50 by calling the Federal Register at (202) 783-3238. Two recent publications by OUST that provide guidance are "Processes Affecting Subsurface Transport of Leaking Underground Storage Tank Fluids", and "Cleanup of Releases from Petroleum USTS Selected Technologies", (EPA-530/UST-881001).

The American Petroleum Institute (API) also has a variety of publications that address technical issues relating to UST's, especially in the area of cleanup technologies. Call (202) 682-8375 for information about API documents.

Darcy Lecturer Invited to Minnesota

The Minnesota Ground Water Association and Cosponsors have invited R. L. Bassett, the 1988-89 Darcy Lecturer to speak at a meeting here in Minnesota in April or May.

Randy Bassett is the Third Annual Henry Darcy Lecturer and will begin his speaking tour in early 1989. This program honors Henry Darcy who established the physical basis on which ground water hydrology has been developing for more than a century. Bassett's travel expenses will be subsidized by AGWSE.

Bassett's schedule will include 8 to 12 visits to different cities. Your newsletter will bring you the details as soon as the date for the Minnesota lecture is set.

Quality - The Quest for Excellence

2,500 Engineers are expected to attend and participate in the Fifth Annual Midwest Engineers Conference and Exposition, which will feature 22 broadranging seminars, two keynote speakers, and over 120 exhibitors at the St. Paul Civic Center, February 7-8, 1989.

Following the event's theme, "Quality - The Quest for Excellence", the February 7th keynote luncheon address will be presented by Dr. Paul MacCready. Dr. MacCready is the creator of the solar-powered GM Sunraycer vehicle which recently won the 1,867 mile race across Australia and is the winner of the 1988 Guggenheim Medal in Engineering, among many other awards. He is also the designer of the Gossamer Albatross, which achieved the first, and only, human-powered flight across the English Channel. In 1971, Dr. MacCready started AeroVironment Inc., a diversified company with services and products in the fields of alternative energy, the environment and aviation. AeroVironment consults on air pollution abatement and hazardous waste problems, conducts associated applied research, and handles a broad spectrum of tasks on wind power programs.

Seminars at the 1989 show span a wide variety of concerns: cities of the future, ethics in engineering, implementing ASCE's Quality Manual, achieving zero defects, quality in CADD, finding financing for innovative ideas and many more topics. This fifth annual event is co-sponsored by the Consulting Engineers Council of Minnesota and the Minnesota Society of Professional Engineers.

Just trying to make a buck

The National Geodetic Survey has begun charging \$6 per 15 minutes of answering requests for control point positions and elevations via telephone.

Comprehensive Local Water Planning Laws Affect Counties

by Denice DeFrates, Minnesota Board of Water & Soil Resources

If you aren't familiar with the numbers 509 and 110B, you soon will be. 509 is the law mandating comprehensive local water planning for the metro area; 110B is the same thing at the county level. They're two very important resource management initiatives because they emphasize that the role of local government is essential to effective resource management.

"Comprehensive" is the key word for 509 and 110B. Both include surface and groundwater planning, focusing on solving existing problems and preventing new ones. They stipulate that plans be reviewed and amended periodically; and, by their very nature, 110B and 509 have an enormous impact on other natural resources, since water management directly affects the land and the organisms that live on it.

Local water planning was mandated in the seven-county metro area by the Metropolitan Surface Water Management Act of 1982 (509). It requires local governments to work jointly to develop surface water plans based on watershed units rather than on political boundaries.

Ten watershed districts and three joint-power watershed organizations existed when 509 was passed and they became responsible for water planning in their area. Cities and townships in unorganized portions of the metro area created new watershed management organizations by entering into joint-power agreements. Called WMO's, these organizations are governed by boards appointed from various local governments within the watershed.

WMO's are responsible for developing 509 plans. Plans must include an inventory of the watershed's physical features; present and future land use; information on the water resources of

the watershed; water-related objectives and policies, and an implementation program.

After 509 plans are developed, they must go through local, regional, and state reviews before final approval can be given by the Minnesota Board of Water and Soil Resources (BWSR). Cities and townships must prepare local water plans that conform to the overall plan once it has been approved and adopted.

Forty-six WMO's have been established. To date, eight have completed the planning process and their plans have been approved by the BWSR. The remaining 38 WMO plans are in various stages of development and review.

The local water planning initiative was expanded to include non-metro counties by the Comprehensive Local Water Management Act of 1985 (Minnesota Statutes, Chapter 110B) and associated state rules (MCAR, Chapter 9300). 110B encourages, but does not require, counties to develop comprehensive surface and groundwater plans.

If a county chooses to prepare a comprehensive water plan, the plan must be developed in accordance with 110B and associated rules. Local involvement is extremely important: after final approval by the BWSR, all local governments within the county must amend their local plans and ordinances to conform to the county plan.

110B was designed to help counties identify existing water management problems before solutions become impractical or extremely expensive. It will help counties anticipate and prevent future problems, and encourage them to safeguard their most valuable resource.

Like 509 plans, 110B plans must cover the entire area within the county; address water problems in the context of watershed units and groundwater systems; be based on principles of sound hydrologic management of water, effective environmental protection and efficient

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management; and be consistent with other comprehensive water plans prepared by adjacent counties and WMO's.

Counties do not have to participate in 110B, but doing so makes them eligible for private and public funds that will not be available to nonparticipating counties. State program eligibility is also effected; having a water plan assures counties of eligibility for grants from Minnesota Pollution Control Agency's Clean Water Partnership Program and DNR's Flood Damage Reduction Program, among others.

In 1986, proposals were submitted to the Legislative Commission on Minnesota Resources (LCMR) by local governments requesting grant assistance for comprehensive local water planning.

A total of 52 counties in six project areas were approved for funding by the 1987 legislature: Zumbro-Root River Joint Powers Board (nine counties); South Central Minnesota Counties Water Planning Project (13 counties); Redwood-Cottonwood Rivers Control Area Board, including the Yellow Medicine River Watershed District (six counties); Stearns County, including the North Fork Crow River Watershed District; Mississippi Headwaters Project (eight counties), and the Northwest Minnesota Counties Water Planning Project (15 counties). There are four additional counties preparing local water plans without state funding: Benton, Carlton, Douglas and Nobles.

Many state agencies are assisting counties with 110B, but the Minnesota Board of Water and Soil Resources (BWSR) is the lead agency.

"One of our roles is to coordinate the efforts of other state agencies to make sure resources for 110B planning are efficiently provided to local governments," said Jim Birkholz, executive director of BWSR.

Because the BWSR has been mandated by law to be the final plan approval authority, the agency is providing as much direct technical assistance as possible to individuals involved in local water planning, helping counties develop

plans that will be approved the first time they are submitted.

"110B is such an important resources management initiative that we want to make sure counties have as much help as possible in getting started," Birkholz said. "We want to make sure county boards, and the local units of government they work with, are aware of the plan content and the amount of work it will entail. Once the commitment is made to develop a plan, we try to provide them with enough expertise in hydrology, land-use management, ordinance development and other technical areas to keep their plans consistent with the intent of the law. Of course, counties will also need to utilize other available technical expertise from public and private sources."

Due to the magnitude of water related problems and associated costs, plans will probably be implemented in a fragmented manner over many years. To maintain the level of enthusiasm among local officials involved in water planning, it is essential that state and local government aggressively fund implementation efforts. The comprehensive water resources act of 1989 would establish a matching grants program by which funds would be provided by the BWSR to counties to assume delegation of water resource protection programs such as administration of the state well code. Passage of the act is critical to successful implementation of local water plans and would verify state commitments to this effort.

The BWSR is a relatively new agency. It is the product of a 1987 legislative mandate merging the Water Resources Board, the Soil and Water Conservation Board, and the Southern Minnesota River Basins Council. At the present time, four staff positions are assigned to coordinate between state and local units of government in the 509 and 110B planning process.

"Implementation of water quality and quantity protection measures will benefit from up-front state assistance," Birkholz said. "We want plans that protect our water, not plans that sit on the shelf gathering dust."

Ground Water Sensitivity Conference

The Water Resources Research Center and MGWA are co-sponsoring a conference on geological sensitivity of ground water to contamination on April 10, 1989 at the Earle Brown Center, the University of Minnesota, St. Paul Campus.

Issues which will be addressed include developments in mapping areas of sensitivity for ground water contamination and mechanisms of contaminant transport to ground water. The conference program should be out soon. For information, call the WRRRC at (612) 624-9282.

Fall Meeting Summary

by Patricia Lang, L. Lehman & Associates

On November 1, 1988, the Minnesota Ground Water Association co-sponsored a half-day seminar entitled "Water Treatment Options; Coping with Contaminated Ground Water". Other sponsors were the Minnesota Environmental Health Association and the Minnesota Department of Health, Division of Environmental Health. Several speakers representing the water treatment industry discussed various methods of removing contaminants from ground water. Topics ranged from point of use treatment using activated carbon, reverse osmosis and ion-exchange to in-situ biotechnology. It was evident from the presentations that the water treatment industry is burgeoning with innovative ideas for cleaning contaminated ground water.

If you missed the seminar, a video tape was recorded by Gunilla Montgomery of the Minnesota Department of Health. She can be reached at 623-5326. A special thanks to Pat Bloomgren for organizing the seminar and to Sunde Engineering and L. Lehman & Associates, Inc. for providing the beverages.

MINNESOTA DEPARTMENT OF HEALTH

Ground Water Quality Control Unit

Abandoned Well Seminar

The Minnesota Department of Health is planning a seminar on abandoned wells to be held on Wednesday, March 22, 1989. This replaces the seminar covering basic groundwater and well subjects that has been held each spring for the last three years, although the Department still plans to repeat that one regularly.

The abandoned well seminar will be held in the same location as previous seminars, the General Instruction Building of North Hennepin Community College, 7511 85th Avenue North Brooklyn Park, Minnesota. The fee, \$30.00 in advance by March 10, 1989, (\$35.00 at the door) covers lunch, refreshments and speaker's expenses. A copy of the Department's Water Well Manual can be obtained for an additional \$15.00. Registration is at 8:00 a.m. and the seminar lasts until 4:00 p.m. For questions, please contact Gunilla Montgomery at (612) 623-5326.

Agenda

- 8:00 a.m. **Registration**
8:30 a.m. **Introduction**
8:45 a.m. **Abandoned wells, definitions, legal requirements, case histories**
 Peter Zimmerman, Minnesota Department of Health
9:15 a.m. **Locating abandoned wells, priorities for sealing**
 Charles Moats, Hydrologist
10:15a.m. **Procedures for sealing abandoned wells and Well Code requirements**
 Roger Renner, E.H. Renner and Sons, Inc.

11:45a.m. **Lunch**

12:30a.m. **Fishing and clearing of abandoned wells**
 George Keys, Keys Well Drilling or alternate
1:15 p.m. **Sealing flowing wells**
 Leonard Pulkrabek, LTP Enterprises
2:15 p.m. **Grouting material and procedures**
 Carl Mason, Baroid Drilling Fluids
3:15 p.m. **Cost sharing options and strategies for well abandonment**
 Speaker to be selected
4:00 p.m. **Adjourn**

REGISTRATION FOR ABANDONED WELL SEMINAR

Detach this portion and send with payment of:

\$30 per attendee _____ (number of attendees) plus optional payment of \$15 per manual
_____ (number of manuals).

Name _____
Affiliation _____
Address _____
City _____
State _____
Zip _____ Telephone _____

Mail by March 12, 1989 to: Ground Water Quality Control Unit, Minnesota Department of Health, 717 Delaware Street SE, P.O. Box 9441, Minneapolis, Minnesota 55440.

MINNESOTA GROUND WATER ASSOCIATION

Seminar on Property Transfer: Environmental Liability and Site Assessment

February 13, 1989

Earle Brown Center
University of Minnesota
St. Paul Campus

The Minnesota Ground Water Association is hosting a seminar on Property Transfer Issues on Monday February 13, 1989. We will concentrate on the role environmental problems or potential problems play in real estate transactions. We will discuss legal vs. technical issues, consultant's responsibilities, the role of the regulators, the roles of bankers and real estate professionals, and the services that each set of professionals can be expected to provide.

Agenda

- 12:00 pm **Registration**
12:45 pm **Welcome and Opening Remarks**
 MGWA Officer
- 1:00 pm **The Concept of Environmental Liability**
 Dennis Coyne, Attorney with Hart, Bruner, O'Brien, & Thornton
- 1:45 pm **Overview of Minnesota Pollution Control Agency Programs which deal with
Property Transfer and Site Assessment.**
 Ron Swenson and Robyn Livermore, Minnesota Pollution Control Agency
- 2:15pm **Risk Avoidance: The Problem from the Viewpoint of the Real Estate
Professional**
 Speaker recommended by the Minnesota Board of Realtors, to be confirmed.
- 2:45pm **Break**
- 3:00pm **Small Generators: Risks where you least expect them**
 Jane Willard, President of EnPro Assessment Corp
- 3:30 pm **Discussion Panel of Environmental Consultants**
 Jane Willard, Moderator
 Gil Gabanski or Rob Wahlstrom, Warzyn Engineering
 Daryl Oman, Delta Environmental Consultants
 Shawn Ruotsinoja, Braun Environmental Laboratories, Inc.
 Dave Vieau, Nova Environmental Services
- 4:30 pm **Refreshments and Further Debate**

SEMINAR REGISTRATION

Fees: Member \$15, Students \$5 with student ID, Nonmember \$25 (includes 1989 membership).
Detach this portion and send with payment (made out to MGWA) to: MGWA c/o Don Jakes,
Treasurer, 943 Lydia Drive, Roseville, Minnesota 55113.

Name _____
Affiliation _____
Address _____
City _____
State _____
Zip _____ Telephone _____

Calendar

January 12 - 13, 1989 *Applied Drilling Engineering for Rotary and Auger Methods (for ground water-related investigations)*, to be held in Columbus, Ohio by NWWA. To be repeated November 9 - 10, 1989.

January 17 - 18, 1989 *1988 - 1989 Activities Forum*, to be held at the Ottawa Congress Center by the Geological Survey of Canada (618) 992-8085.

January 23 - 25, 1989 *Corrective Action for Containing and Controlling Ground Water Contamination*, to be held at the Orlando Marriott, Orlando Florida by NWWA.

January 23 - 25, 1989 *Principles of Ground Water Hydrology*, to be held at the Orlando Marriott, Orlando Florida by NWWA.

January 23 - 26, 1989 *How to Successfully Design and Construct Water Wells*, to be held in Madison, Wisconsin by the University of Wisconsin-Madison Engineering Professional Development Program. Contact: Roy Holub (608) 262-5361.

January 24 - 25, 1989 *Applications of Environmental Isotopes to Practical Ground Water Studies*, to be held at the Orlando Marriott, Orlando Florida by NWWA.

January 26, 1989 *DRASTIC Workshop*, to be held at the Orlando Marriott, Orlando Florida by NWWA.

January 30 - February 3, 1989 *Management of Hazardous Materials and Hazardous Wastes*, to be held in Findlay, Ohio by NWWA.

January 31 - February 2, 1989 *Treatment Technology for Contaminated Ground Water*, to be held in San Diego, California by NWWA.

January 31 - February 2, 1989 *Introduction to Ground Water Geochemistry*, to be held in San Diego, California by NWWA.

January 31 - February 2, 1989 *Theory and Practice of Ground Water Monitoring and Sampling - Designed for Newly Practicing Professionals*, to be held in San Diego, California by NWWA. To be repeated in May in Burlington, Massachusetts and in September in Dublin, Ohio.

February 7 - 9, 1989 *Solving Ground Water Problems with Models*, a conference to be held in Indianapolis, Indiana by NWWA.

February 12 - 17, 1989 *IBM PC Applications in Ground Water Pollution and Hydrology: A Hands-On Short Course*, to be held in Dublin, Ohio by NWWA. Will be repeated in July in Princeton, New Jersey.

February 13 - 15, 1989 *Theory and Application of Vadose Zone Monitoring and Sampling*, to be held in Portland Oregon by NWWA. To be repeated in August in Columbus, Ohio.

February 13 - 15, 1989 *Theory and Application of Borehole Geophysics to Ground Water Problems*, to be held in Portland Oregon by NWWA. To be repeated in August in Columbus, Ohio.

February 22 - 24, 1989 *Critical Issues in Underground Storage Tank Management*, to be held in Denver, Colorado by NWWA. To be repeated in March in Newark, New Jersey.

March 1 - 3, 1989 *Understanding and Applying Groundwater Flow through Fractured Media*, to be held in Madison, Wisconsin by the University of Wisconsin-Madison Engineering Professional Development Program. Contact: Roy Holub (608) 262-5361.

March 2 - 3, 1989 *The 1988 Drought and Global Climatic Changes: Effect on Wisconsin's Water Resources*, to be held in Madison, Wisconsin. This is the 13th Annual Meeting of the Wisconsin Section of AWRA. Contact Warren A. Gebert, USGS 6417 Normandy Lane, Madison, Wisconsin 53719.

March 8 - 9, 1989 *Theory and Application of Surface Geophysics to Ground Water Investigations*, to be held in Columbus, Ohio by NWWA. To be repeated in September in Salt Lake City, Utah.

March 8 - 11, 1989 *International WaterTech '89*, to be held in Hong Kong. Contact Gloria Giles, Fairs and Exhibitions Ltd. Suite 12, Accurist House, 44 Baker St. London W1M 1DH, UK.

March 9 - 10, 1989 *The Fundamentals of Ground-Water Contamination*, to be held in Arlington, Virginia by American Ecology Services, Inc. Contact: Richard M. Miller (212) 371-1620. Will be repeated at the same location in April and May.

March 13 - 16, 1989 *Application of Geophysics to Engineering and Environmental Problems*, to be held in Golden, Colorado by the Society of Engineering and Mineral Exploration Geophysicists. Contact Ron Bell, BellWest Geoservices, Box 10845, Edgemont Branch, Golden, Colorado 80401.

March 20 - 23, 1989 *Analysis and Design of Aquifer Tests*, to be held in Columbus, Ohio by NWWA.

March 20 - 24, 1989 *Applied Ground Water Modeling*, to be held at Butler University in Indianapolis, Indiana by the IGWMC.

March 20 - 23, 1989 *New Field Techniques for Quantifying the Physical and Chemical Properties of Heterogeneous Aquifers*, to be held in Dallas, Texas by WRR, Auburn University, Alabama 36849-5124.

March 21 - 23, 1989 *Introduction to Ground Water Geochemistry*, to be held in Columbus, Ohio by NWWA. To be repeated in October in Burlington, Vermont.

April 6 - 7, 1989 *The Fundamentals of Ground Water Contamination*, to be held in Arlington, VA. Contact R. M. Miller, American Ecology Services, Inc., 127 East 59th St. New York, NY.

April 17 - 21, 1989 *Applied Ground Water Modeling*, to be held at Butler University in Indianapolis, Indiana by the IGWMC.

April 19, 1989 *Industrial Wastes Disposal: 1989 Concerns and Remedies*, to be held in Rockford, IL. Contact Federation of Environmental Technologists, Inc. PO Box 185, Milwaukee, WI 53201.

April 20 - 21, 1989 *North-Central Section of the Geological Society of America Annual Meeting*, to be held in Notre Dame, Indiana. For more information, contact: Sandra Rush, GSA Communications Department, Box 9140, 3300 Penrose Place, Boulder, Colorado 80301.

April 21 - 25, 1989 *Nonpoint Source Conference - Making Nonpoint Pollution Control Programs Work*, to be held in St. Louis, Missouri. For more information contact: NACD, 1052 Main St. Steven's Point, Wisconsin 54481.

May 1, 1989 *Minnesota Society of Optical Microscopists Annual Symposium: Video Microscopy*, to be held at the Science Museum of Minnesota. For more information, contact: Sally Cameron at Mager Scientific (612) 633-6884.

May 10-19, 1989 *IAHS Third Scientific Assembly*, to be held in Baltimore, Maryland. The Third Scientific Assembly will be a forum for review of the latest developments in the field of hydrology. For more information, contact: IAHS Assembly, c/o AGU, 2000 Florida Ave. NW, Washington, D.C. 20009.

June 27 - 30, 1989 *AWRA Symposium on "Headwaters Hydrology" and Indian Water Rights & Water Resources Management*, to be held in Missoula, Montana. Contact AWRA, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192.

July 11 - 13, 1989 *Principles of Ground Water Hydrology*, to be held at the Westin Galleria, Dallas, Texas by NWWA. Will be repeated in September in Dublin, Ohio.

July 14, 1989 *Environmental Site Assessments*, to be held at the Westin Galleria, Dallas, Texas by NWWA. To be repeated in August in Columbus, Ohio and in September in Salt Lake City and San Francisco.

August 6-10, 1989 *URISA '89 Urban and Regional Information Systems Association*, to be held at the Boston Marriott Copley Place. Contact URISA 319 C Street, SE, Washington, DC 20003.

September 25 - 27, 1989 *Fracture Trace and Lineament Analysis*, to be held in San Francisco, California by NWWA.

November 12 - 17, 1989 *National Water Quality Symposium*, to be held in Orlando, Florida by USGS Water Resources Division. Contact Gary Pederson, Southeastern Regional Office, Atlanta, Georgia (404) 331-3394.

For information about meetings and seminars to be held by the NWWA, contact NWWA at 6375 Riverside Drive, Dublin, Ohio 43017 (614) 761-1711, Telex 241302.

For information about Short Courses held by IGWMC, contact Margaret Butorac, International Ground Water Modeling Center, Holcomb Research Institute, Butler University, Indianapolis, IN 46208 (317) 283-9458.

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Resource Guide to State Environmental Management

The *Resource Guide to State Environmental Management* features a comprehensive description of the way states are funded and organized to manage environmental and natural resource programs. It includes names, titles, addresses, and phone numbers of key state personnel for air quality, waste management, water and natural resources agencies and programs. It tells how much each state is spending on sixteen environmental categories by totals, per capita expenditures, and the percentage of state expenditures for the environment. Organizational charts show how the programs interrelate. This resource guide is available in paper or electronic (dBase III+ or Lotus 1-2-3) form from the Council of State Governments, P.O. Box 11910, Lexington, KY 40578.

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Association for Women Geoscientists Foundation Scholarships and Awards

The Association for Women Geoscientists Foundation (AWGF) is pleased to announce the availability of the **Chrysalis Scholarship** to be awarded March 1, 1989. The \$250 award will be made to a geoscience Masters or PhD candidate to cover expenses associated with finishing her thesis. Chrysalis is for candidates who have returned to school after an interruption of one year or longer in their education. The support can be used for typing, drafting, child care expenses, or anything necessary to allow a degree candidate to finish her thesis and enter a geoscience profession.

Applications should be made by January 31, 1989 and sent to the Foundation. For more information or applications, please write Chrysalis Scholarship, AWGF, c/o Resource Center for Associations, 10200 West 4th Ave. #304, Wheat Ridge, CO 80033.

The Applicant should write a letter stating her career goals and ob-

jectives, how she will use the money, and explain the length and nature of the interruption to her education. Her thesis advisor must submit a letter stating when the candidate will finish her degree and what requirements are as yet unfinished. This letter should also include reference to the applicant's prospects for future contributions to the geosciences. Two additional letters of recommendation are required.

The Foundation's first **Outstanding Educator Award** was presented to Maria Luisa Crawford of Bryn Mawr College. The award was given at a special breakfast on November 2, 1988, during the Geological Society of America National Convention in Denver, Colorado. This award was given by the Foundation recognizing Ms. Crawford as an outstanding educator who has demonstrated excellence and commitment to the higher education of women students in the field of earth science.

Weecha Crawford has provided a role model to many young women studying geology and preparing to enter geoscience professions. AWGF received sixteen letters from her students and colleagues recommending her for the award. Five of these letters were from former students who are now work-

ing in academia and directly passing on the inspiration they received from Weecha. A researcher of the highest caliber, Weecha Crawford, who is William R. Keenan, Jr. Professor of Geology, has chaired the Geology Department at Bryn Mawr for twelve years, published more than eighty papers and abstracts and received more than a dozen National Science Foundation grants for her work. She is truly an inspiration to everyone in her field.

The AWG Foundation was established by the Association for Women Geoscientists in 1983 to develop and fund innovative programs designed to encourage women and girls to study earth science and to investigate career opportunities and advancement in the geoscience professions. The Foundation hopes to make its Educator Award an annual event that will inspire educators to do their part in bringing more women into earth science.

According to the National Science Foundation, Women scientists comprise 15% of the total science work force, but a recent survey by the American Geological Institute indicated that women are only 5% of geoscience professionals.

AMERICAN GROUND WATER TRUST SCHOLARSHIP

From the Newsletter of the Association of Ground Water Scientists and Engineers:

Undergraduate students pursuing academic studies beneficial to America's ground water resources are invited to apply for scholarship support from the American Ground Water Trust (AGWT).

AGWT, a non-profit public foundation serving as a ground water education advocate, has awarded 26 scholarships since the inception of the program in 1975. In recent years, AGWT has awarded scholar-

ships of \$2,000 each. However, the number and amount of the scholarships awarded are determined and reviewed annually by the AGWT Board of Trustees.

Applicants must complete and submit an AGWT scholarship application by April 1, 1989, to be eligible for funds that could be awarded for the 1989-90 academic year.

To receive an application, candidates should send a stamped, self-addressed envelope to: AGWT, Scholarship Program, 6275 Riverside Drive, Dublin, Ohio 43017.

MGWA Dues for 1989 are due February 1st!

Cool it

A modern adaptation of the oldest form of air conditioning could help reduce the demand on air conditioning systems during peak load situations. Described in a paper presented at the 23rd Inter-society Energy Conversion Engineering Conference this past summer, the installation would consist of a heat conduction slab, a porous slab, and a water delivery system. The heat conduction slab would transfer heat from inside the building to the water, which would then evaporate, removing heat from the building. The window requires further investigation to establish design and operation parameters (*ASME News Release*).

Trends in Minnesota's Resource Conditions

The following is an excerpt from a report published by EQB this summer. It was first published in Future Scans by the Minnesota State Planning Agency.

Water Quality

The quality of Minnesota's water remains good. The state has made great strides in controlling pollution from "point" sources such as municipal waste treatment plants and industrial plants. More than 90 percent of these facilities are in compliance with permit conditions. Fecal coliform bacteria and biochemical oxygen demand, two critical indicators of water quality, are both significantly improved from their levels in the late 1960's.

Non-Point Source Pollution

Less progress has been made in controlling "non-point" pollution--pollutants that cannot be traced to a single point of discharge. Common non-point sources are agricultural land, construction, urban parking lots, and forestry. Pollution from non-point sources accounts for the majority of water quality problems today. Three-fourths of all river miles which do not meet standards result from non-point or unknown sources of pollution.

Non-point pollution is hard to control. Not only are the sources of pollutants more difficult to identify, they are more numerous, they can be the actions of individuals, and are much more difficult to regulate. For example, controlling the application of farm chemicals or urban landscaping practices is much more controversial than upgrading a sewage plant or shutting down a discharge pipe.

Volatile Organic Chemicals

Volatile organic chemicals (VOC's) result from the production, use, and disposal of products such as paint thinner, cleaners, refrigerants, inks, dyes, preservatives, and detergents. These substances, which include known or suspected human carcinogens and

other harmful chemicals, are being detected in Minnesota's drinking water. Eight percent of the community water systems recently surveyed by the Department of Health were found to contain VOC's. Nearly two percent had VOC's in excess of acceptable drinking water levels. Contaminated wells were found throughout the state.

VOC's result primarily from leaking storage tanks and improper disposal of wastes. These chemicals have their greatest effect on ground water which, once contaminated, is likely to remain so for many years. The widespread occurrence of VOC's and the risks associated with long-term exposure to very low levels of these chemicals raise serious public health concerns.

Waste Disposal Practices

Most of Minnesota's solid waste is disposed of in one of the state's 131 landfills. At least 84 of these landfills are known or suspected to contribute to ground water pollution, 37 caused contamination above safe drinking water standards. Aggressive development of alternatives, including incineration, composting, and recycling, is imperative. However, none of these alternatives is without problems. Minnesota also has 139 known hazardous waste sites and an estimated 200 other sites where ground water contamination may be a problem. While large generators of hazardous waste are carefully monitored, the large number of small waste generators are much more difficult to reach and to identify.

Pesticides in Ground Water

An estimated 40 to 45 million pounds of active pesticide ingredients are applied to Minnesota farmland each year. There is increasing evidence that certain pesticides are entering ground and surface waters and are posing a potential threat to drinking water. Recent state surveys found pesticides in 39 percent of the wells sampled, although concentrations were relatively low in virtually all cases. These surveys also indicate the problem of pesticides in ground water is most widespread in central and

southeastern Minnesota. Limiting the use of these chemicals will be difficult, but the unknown health implications of exposure to low levels of pesticides in drinking water and the difficulty of cleaning up contaminated ground water raise significant issues which must be addressed.

College of Natural Resources

On August 12, 1988, the Board of Regents of the University of Minnesota approved the change in the name of the College of Forestry to the College of Natural Resources. The College of Natural Resources is located on the St. Paul Campus of the University with a significant presence at the Cloquet Forestry Center in northern Minnesota. The College of Forestry was established as an independent collegiate unit in the Institute of Agriculture, Forestry, and Home Economics in a reorganization in 1970. Forestry degree programs began at the University in 1903.

A newly formed Department of Fisheries and Wildlife joined the College of Forestry in 1983. Fisheries and wildlife programs had been a part of a department in the College of Agriculture. The implications of this expansion included finding an appropriate name. It was recommended that the College of Forestry be renamed College of Natural Resources to represent the broad scope of programming which had existed even prior to the fisheries and wildlife development.

The College of Natural Resources remains a part of the Institute of Agriculture, Forestry, and Home Economics in the University. Its faculty retains a strong role in the research of the Minnesota Agricultural Experiment Station and maintains its long-standing relationship with the Minnesota Extension Service.

The offices of the College of Natural Resources are housed in the new Natural Resources Administration Building, 2003 Upper Buford Circle, St. Paul, Minnesota, 55108.

Property Transfers: Environmental Liability and Site Assessment

The MGWA Spring Meeting will be held in the afternoon of February 13th at the Earle Brown Center, University of Minnesota, St. Paul Campus. Speakers from the Minnesota Pollution Control Agency, the Minnesota Realtor's Association, and the legal and consulting communities have been invited to speak about property transfer issues.

Environmental liability is a daunting prospect for buyers, sellers, real estate agents, attorneys, appraisers, land developers, investors, and bankers involved in the sale of properties. Legal professionals, real estate professionals, federal, state and local regulators, and environmental professionals are required to work together to meet environmental protection goals while avoiding unnecessary delays and costs to business.

This meeting is meant to bring these professionals together and to clarify some of these complex issues.

A professional environmental assessment can allay fears about past uses of a property, thus increasing the value of the property. If problem areas are detected, the seller then has a basis for withdrawing that portion of the property from the market or instigating remedial action. A documented environmental assessment places the seller in a stronger position, can protect property against future claims, and is increasingly required before a property can be financed.

Reserve the afternoon of February 13th now, and watch your mail for the announcement which will be sent as soon as the agenda is finalized. For information call Jeanette Leete at (612) 296-0433.

This meeting will cost \$15 for members, \$5 for students, and \$25 for non-members - a not-so-subtle reminder to pay your 1989 dues!

TCCAP Update

Repository relocated

The U.S. Army has opened a repository in New Brighton City Hall which contains all reports regarding Twin City Army Ammunition Plant's groundwater contamination.

The location of the repository is:

New Brighton City Hall
Vault Area - Main Floor
803 5th Ave. NW
New Brighton, Minnesota 55112
Hours 8:00 am to 4:30 pm

The documents are also available at the following locations:

Twin Cities Army Ammunition Plant
Administrative Building #105
First Floor - Lobby

or

Second Floor Administrative Record Area
New Brighton, Minnesota 55112-5000
Hours 7:00 am to 3:00 pm

The two off-post repositories at the Arden Hills Branch of the Ramsey County Public Library and the St. Anthony Branch of the Hennepin County Public Library have been closed.

If you have any questions regarding the repositories, please call the Twin Cities Army Ammunition Plant, Administrative Record Area, (612) 633-2301, extension 669.

Uses for Treated Ground Water Studied

The Army, in association with the Rice Creek Watershed District, announced the preparation of a potable water management study for its groundwater recovery system in the vicinity of TCAAP. E. A. Hickok and Associates, a division of James M. Montgomery, Consulting Engineers, Inc., has been retained as the consultant for the study. In response to the discovery of volatile organic compounds in the regional groundwater system, the Army has instituted a response action to re-

store ground water quality. This includes ground water recovery wells, installed to act as a barrier to further migration and to withdraw contaminated ground water for treatment. Approximately 1.3 million gallons per day of potable water are currently being produced as a result of the treatment. Future ground water recovery systems could produce up to 10 million gallons per day of potable water.

This study will analyze water demands and uses in the vicinity of TCAAP and will examine the feasibility of alternative uses for treated water from the ground water recovery system. It will address the technical problems, environmental effects, public health issues, and institutional factors related to solutions such as interconnections with municipal potable water supply systems, discharges to rivers and lakes, ground water recharge, industrial use, and seasonal water diversions including irrigation. The final study is anticipated to be completed in the summer of 1989 (*TCAAP Press Release*).

News of Members

Kelton Barr is pleased to announce that he is opening an office in Minneapolis for Geraghty & Miller. He mentioned that he is looking for a "few good hydrogeologists". Kelton can be reached at 824-5415.

Bob Beltrame is now with Donohue.

Pat Bloomgren was selected to be the Assistant Director of the Board of Soil and Water Resources. The Board's offices have recently moved to 155 South Wabasha, Suite 104, St. Paul, Minnesota 55107. The phone number is (612) 296-3767.

Richard Corbett is now the local contact for Q.E.D. Environmental Systems. His firm is Automatic Systems Co. in St. Louis Park; (612) 545-2900

New Officers assume duties in 1989

Congratulations and welcome to the MGWA Board to Bob Karls and Don Jakes. Bob and Don have been elected President-Elect and Treasurer respectively of the Minnesota Ground Water Association in Fall elections.

Bob Karls is a graduate of St. Cloud State (B.S. 1980) and the University of Arizona (M.S. 1982). Bob is Midwest Regional Manager for Delta Environmental Consultants, Inc., where he has worked since 1986. Bob served from 1982 to 1986 as a Hydrogeologist with the MPCA in Site Response. From 1977 to 1982 he worked for the USGS Water Resources Division in Grand Rapids and Denver.

Don Jakes is a graduate of the University of Minnesota (B.A. Geology 1977) and has done post-graduate work in hydrogeology at the U of M as well. Don is Supervisor of the Ground Water Unit of the MPCA where he has worked since 1981. Prior to joining the MPCA staff Don served as a geologist for the Minnesota Department of Transportation from 1979 to 1981.

Bob Karls will serve the MGWA as President Elect for 1989 and become President in 1990. Don Jakes will serve a two year term as Treasurer.

The present MGWA officers and board welcome these new officers and we hope MGWA members will provide enthusiasm, ideas, and participation in meetings and activities in support of these new officers who by their willingness to serve on the board have shown a real interest and dedication to the MGWA and its goals and activities.

A sincere thank you and congratulations on a job well done to Pat Bloomgren for her outstanding service to the MGWA and the Minnesota environmental community during her tenure as Treasurer. She planned and coordinated meetings, did meeting registration, and handled MGWA funds. We hope her departure as Treasurer will not mean the end of her contributions to the MGWA.

In an effort to get back on a schedule of elections, we will select a President-Elect and Secretary in the fall of 1989. Those of you who advised the nominating committee to call back next year, be forewarned, you will be called. Suggestions for nominations will be gratefully received by the committee.

-Gordie Hess

Comprehensive water resources protection act of 1989

This synopsis of the bill was provided by John Wells of the State Planning Agency

Process:

The initiative implements key recommendations of the **Minnesota Ground Water Protection Strategy** and the **Strategy for the Wise Use of Pesticides and Nutrients**. These strategies were developed by the Pollution Control Agency and the Environmental Quality Board (EQB) and its member agencies over a two year period, with the advice of citizens and interest groups.

Purpose:

To establish the policy framework for protection of Minnesota's water resources by focusing on preventing pollution, understanding and managing areas where ground water may be more sensitive to contamination, and by establishing a new state commitment to land stewardship and the wise use of pesticides and nutrients.

Objective:

To improve coordination and understanding of ground water.

Accelerate research and monitoring needed to define location of ground water, how it is recharged, and how it is contaminated by land use.

Establish data compatibility requirements and require a state plan for coordinating monitoring of water resources.

Objective:

To build a partnership with local government.

Provide grants to counties to help develop comprehensive water plans and to carry out environmental protection priorities of these plans.

Objective:

To protect drinking water supplies.

Revamp the state well construction code to make it enforceable, including development of a state permit program for construction of new wells.

Expand monitoring of public water supplies.

Establish a program for sealing abandoned water wells.

Objective:

To better control sources of pollution.

Direct MPCA to establish numerical limits for contaminants.

Prepare a state pesticide management plan and enhance pesticide and fertilizer control efforts.

Establish a statewide waste pesticide pick-up program.

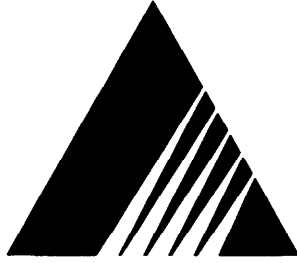
Objective:

To begin a joint agency communication effort.

Water information communication through MEEB.

MDA to lead low-input agriculture focus with Minnesota extension to accelerate integrated pest management activities.





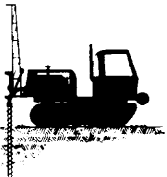
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Join the Minnesota Ground Water Association!

If you are reading this newsletter second-hand, we'd like to take this opportunity to invite you to become a member of **MGWA**. Annual dues are \$10 for professional members and \$5 for students.

Just complete the form below and mail to: Minnesota Ground Water Association, c/o Don Jakes, 943 Lydia Drive, Roseville, MN 55113

Name _____

Affiliation _____

Mailing Address _____

City, State, Zip Code _____



GROUND WATER HYDROLOGY FOR WATER WELL CONTRACTORS

By Stuart Smith, Jim Poehlman, Dana Armitage, David Nielsen, Harold Heiss and Joseph Ritchie (1982). This book presents geologic factors which control the occurrence, availability and quality of ground water. Written especially for water well contractors, it can be easily understood by experienced drillers and is excellent reading material for beginning drillers. Non-member: \$31.25. Member: \$25.00.

() Yes, I want to purchase _____ copy(ies) of "Ground Water Hydrology for Water Well Contractors" - #24

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My check or money order for the full amount is enclosed. Return to NWWA, Inquiry Dept. 6375 Riverside Dr., Dublin, OH 43017

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