

Minnesota Ground Water Association

www.mgwa.org

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President's Column

2002 is the Minnesota Ground Water Association's twentieth year. Happy 20th Anniversary everyone! This is a great organization to be a part of. We are currently over 500 members strong and accomplishing great things by working together.

We just finished one of the best attended conferences. Our MGWA Spring Outdoor Action Conference was held on April 23, 2002, at Johnson Screen Company in New Brighton, Minnesota. Minnesota weather can be unpredictable. Two days prior to the conference it snowed five inches, and on the day before we still had snow on the ground as we were setting up. Fortunately, the sun came out and warmed things up to 60 degrees, which made for a good day overall.

Congratulations to **Matt S. Walton** who was honored as the first recipient of the Minnesota Ground Water Association's Outstanding Service Award. He is well deserving of this prestigious award. I would like to thank the following people and companies that helped us put on this Drilling and Well Technique exposition. First and foremost, we need to thank Al Smith and everyone from Johnson Screen for allowing us to run this conference at their facility. Thank you to John Schneiders from Water System Engineering for a great talk on "Chemical Rehabilitation of Wells." Also, thank you to the drill crews and vendors, Bergerson Caswell, Boart Longyear, Layne Christensen, Mark J. Traut Wells, Matrix Environmental, Braun Intertec Corp., Johnson Screen, Cetco, Diedrich Drilling, Enchem, and Geoprobe Systems. They took time out of their busy schedules to volunteer at this event. Please remember them the next time you need work done by a professional in the field. Finally, special thanks to the

Conference Committee for all of their hard work in putting this program together. It was a great success.

Thank you if you attended the conference. Hopefully, you had a moment to complete the evaluation form. They will help us to review and refine the conference for future events. We want to ensure that we are meeting your needs and keeping things interesting and fun. The overall responses were very good. Many people mentioned that they would like to see a conference like this every five years. We hope to continue this tradition and improve on it each time.

Plans are already in the works for the 20th Anniversary Summer Picnic on August 3rd, the Fall Field Trip, and the Fall Conference on the topic of Small Municipalities and Water Supply Issues.

The Fall Conference will be November 12, 2002, at the Earle Brown Center. I'm looking for volunteers to be on the planning committee for this conference. We also need volunteers for the Membership Committee. Although we have over 500 members, there is only a small core group that currently does most of the work. This organization needs your participation and support. Please make a commitment to get a little more involved.

A recurring topic of discussion at MGWA Board meetings over the years has been: What role can and should the MGWA play in providing factual comment to pending legislation? The idea was brought up again after we listened to a few presentations at the fall conference, which centered on the need for us as professionals to voice concerns and opinions regarding legislation and funding issues in our industry. Providing comment to legislation is largely a matter of educating legislators who have little time to become

well versed in the intricacies of environmental science. The Board is considering drafting policy to guide MGWA when it seems wise that the organization compose factual comments for rulemaking or legislative hearings.

Initial thoughts include creating an ad hoc committee of members who are knowledgeable in whatever area is under discussion. We assume that we would allow enough time to announce the pending comment in the newsletter or on the web so that the membership would have the opportunity for input. Our final draft/comment would then be submitted during public review and comment periods that precede finalization of legislation or policy. The comments would be preceded by an introduction explaining why the comments are being submitted, and who the organization represents. It would then be followed by recommendations for consideration. Please contact me or the Education Committee in regards to this new idea. It is a great opportunity for us to make a difference.

Have a great summer!

Rob Caho, MGWA President

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MGWA Newsletter Contacts

Editor-In-Chief

Norm Mofjeld
Minnesota Department of Health
(651)215-0823
norman.mofjeld@health.state.mn.us

Newsletter Team

Tom Clark
tom.p.clark@pca.state.mn.us

Steve Robertson
steve.robertson@health.state.mn.us

Jan Falteisek
jan.falteisek@dnr.state.mn.us

Jim Lundy
jim.lundy@pca.state.mn.us

Jon Pollock
frontline@uscorp.net

Aaron Fredrikson
aarmatfre@yahoo.com

Advertising Manager

Jim Aiken
Polaris Group, Inc.
(952)361-4944
jaiken@polarisgroupinc.com

MGWA Management & Publications

Dr. Jeanette Leete
WRI Association Management
(651)276-8208
Office@MGWA.org

MGWA Web Page

Visit www.mgwa.org for
MGWA information between
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membership and conference or
field trip business transactions.

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given. Views expressed in this
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MGWA Welcomes Newsletter Editor and Newsletter Team Member

Norm Mofjeld Takes Over as Newsletter Editor

Norm Mofjeld, a hydrologist with the
Well Management Section in the divi-
sion of Environmental Health of the
Minnesota Department of Health
(MDH) has assumed the position of
MGWA Newsletter Editor, effective
with this issue. Norm becomes the
sixth editor in the Association's 20



years, taking over from Tom Clark
who has been editor since 1995.
Norm has a Bachelor's degree in Soil
and Water Science from the Univer-
sity of California at Davis, a Master's
degree in Soils from Washington
State University, and has taken addi-
tional hydrogeology course work at
the University of North Dakota. He is
a licensed professional geoscientist in
Minnesota. In addition to being active
in MGWA, Norm has held several vol-
unteer positions with our sister orga-
nization, the Minnesota Association of
Professional Soil Scientists (MAPSS).
He served as Secretary, 1999-2000
and has been active in their Educa-
tion Committee for many years, serv-
ing as both chair and co-chair.

Norm's professional experience
includes three years as a Forest Soils
Specialist with the Washington State
Department of Natural Resources, 11
years as a Soil Scientist with the Uni-
versity of Minnesota Agricultural
Experiment Station, and nine years
with MDH, where he is coordinator for
the Well Disclosure Program (see this
issue's Capillary Fringe) and is author

of the popular Well Owner's Hand-
book, as well as numerous bro-
chures and educational pieces for
the Well Management Section.
Norm's outside interests include
making home improvements (which
he says goes with the name Norm).
He and his wife are the proud own-
ers of two Miniature Schnauzers
and, according to Norm, there is a
question of who is training whom.

Newsletter Team Welcomes Aaron Fredrikson

Your Newsletter Team is pleased to
announce the addition of Aaron
Fredrikson. Aaron is a Project Man-
ager with Pace Analytical Services,
Inc. (Field Services Division) where
he writes equipment procedures and
maintains testing equipment. Aaron
has an Associate of Applied Science
degree in the Air and Water Analysis
program from Century College.
Recently, he has created digital
video (DV) standard operating proce-
dures that involve integrating video
instruction and written documents.
These can then be accessed from a
computer network or from a
CD-ROM when using a lap-top com-
puter at the job site. Aaron has a
special interest in improving the
MGWA web site and helping



transition the newsletter to a fully
electronic format. He will be working
with our publisher, WRI, over the
coming year as these changes and
upgrades are implemented.

In his spare time, Aaron enjoys creat-
ing graphic designs, reading history
and running. He says he's currently
engaged to a "wonderful woman" and
will be married on a date to be
determined.

Capillary Fringe

Norm Mofjeld, PG, Hydrologist, Well Management Section, Division of Environmental Health, MDH

In the last issue of the MGWA Newsletter in Capillary Fringe, Laurel Reeves discussed the presence of two wells located at a property at Grove Street and Lafayette Road in Saint Paul. She indicated that the Minnesota Department of Natural Resources investigated the possibility of using these wells for the groundwater level monitoring program, but due to the demolition activities of an old warehouse on the property, the wells were not suitable for monitoring because of oil in one of the wells and a damaged wellhead of the other. She asked two questions: Why wasn't the presence of the wells known in the early stages of the project? What can our profession do to help developers, demolition and construction contractors, and the general public be more aware of unused and abandoned wells? My primary responsibility with the Well Management Section is with the administration of the well disclosure program. The questions raised by Laurel Reeves are good ones and they provide me with an opportunity to discuss the well disclosure process in Minnesota.

The requirement for well disclosure at the time of property transfer was established in the 1989 Minnesota Ground Water Protection Act. The intent of the law (Minnesota Statutes, section 103I.235, Real Property Sale; Disclosure of Location of Wells) was to make the presence of any wells regardless of status known to the buyer with an understanding that any unused, unsealed wells would be dealt with shortly after the sale of the property. The law had the effect of promoting well sealing of unused wells. Many of the 12,000 to 13,000 wells sealed each year are a result of the well disclosure process.

The law requires that when a property is sold in Minnesota, the seller must disclose in writing to the buyer any wells on the property by indicating on a sketch map where they are located, and indicating the status of each of the wells, which can be in

use, not in use, or sealed by a licensed well contractor. The well(s) are required to be disclosed twice, once before a purchase agreement is signed, on a well disclosure statement, and again at closing, on a Well Disclosure Certificate. According to Minnesota Statutes, section 103I.235, subdivision 2, "Unless the buyer and seller agree to the contrary, in writing, before the closing of the sale, a seller who fails to disclose the existence or known status of a well at the time of the sale and knew or had reason to know of the existence or known status of the well, the seller is liable to the buyer for costs relating to sealing of the well and reasonable attorney fees for collection of costs from the seller, if the action is commenced within six years after the date the buyer closed the purchase of the real property where the well is located."

Following the closing of the sale of a property, the deed is recorded by the county recorder. The county recorder cannot record a deed without a well disclosure certificate if a certificate of value is required (property sells for a consideration in excess of \$1000). A well disclosure certificate is not required if a well disclosure certificate was previously filed and there has not been a change in the number or status of wells, but a statement is required on the deed indicating that there has not been a change since the last previously filed well disclosure certificate. Once the county recorder has received the well disclosure certificate and collects the fee (currently \$20, will be \$30 effective July 1, 2002), the county recorder submits the certificate to the Minnesota Department of Health (MDH).

After the MDH receives the well disclosure certificate, the information from the certificate, such as buyer's name and mailing address, property address, legal description, number and status of wells, is entered into a database and the certificate is scanned into an optical storage retrieval system. The database has recently been made available on the web. For access, first go to the Well Management Section home page at

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2002 Board of Directors

Past President

Jim Stark
U.S. Geological Survey
(763)783-3230
FAX (763)783-3103
stark@usgs.gov

President

Robert Caho
Bergerson-Caswell
(763)479-3121
FAX (763)479-2183
rwc_bc@yahoo.com

President-Elect

Marty Bonnell
DPRA
(651)227-6500
FAX (651)227-5522
mbonnell@dpra.com

Secretary/Membership

Jon Pollock
Frontline Environmental
(952)892-0367
FAX (952)892-0401
frontline@uscop.net

Treasurer

Eric Hansen
Pinnacle Engineering
(763)315-4501
FAX (763)315-4507
ehansen@pineng.com

The primary objectives of the MGWA are:

- Promote and encourage scientific and public policy aspects of ground water as an information provider;
- Protect public health and safety through continuing education for ground water professionals;
- Establish a common forum for scientists, engineers, planners, educators, attorneys, and other persons concerned with ground water;
- Educate the general public regarding ground water resources; and
- Disseminate information on ground water.

Shallow Buried Aquifers of Murray County, Minnesota

James A. Berg, Minnesota DNR Waters

Introduction and Purpose

Southwestern Minnesota is a region of limited ground-water resources. A consortium of ground-water appropriators, with assistance from a geological consulting company, is exploring for buried aquifers in Murray County to establish a new well field for regional water distribution. This group consists of Lincoln-Pipestone Rural Water (LPRW), Red Rock Rural Water, and the City of Worthington. The Minnesota Department of Natural Resources, Division of Waters (DNR Waters), has provided technical advice to this group since the beginning of this project in the summer of 2000. DNR Waters believes that a better understanding of aquifer distribution will help appropriators achieve their resource needs and help avoid future resource conflicts. The purpose of the project was to better define some of the limited extent glacial drift sand aquifers in the area. Murray County is underlain by clayey drift overlying Cretaceous and Precambrian bedrock. The glacial drift and Cretaceous bedrock contain limited extent sand and sandstone aquifers, respectively. This mapping project has shown that Murray County, centrally located within the region, may have better buried glacial ground-water supplies than some other counties in the region

Methods

The basic data used in this study consist of a surface geology map, a regional Quaternary stratigraphy framework, and a database of accurately located and interpreted water-well construction logs (drillers' well logs) in the County Well Index (CWI). All of these elements were compiled for the Southwestern Minnesota Regional Hydrogeologic Assessment (Setterholm, 1995). This information represents the minimum data required for a first approximation of buried aquifer boundaries within the study area. These data were used to produce an extensive network of

correlated geologic cross sections that is an essential part of this study. Two cross-sections from this cross-section network were selected for presentation in this article (Figure 1).

The main purpose of establishing the cross-section network was to identify glacial till units and sand and gravel outwash units with a common geologic history that could be mapped across most of the area. Three key assumptions were used to define the geologic boundaries shown on the cross sections. First, buried oxidized till (yellow to brownish color) indicates ancient land surfaces. This till existed at or near the surface long enough for oxygen-rich water to chemically change the minor amounts of iron-containing minerals to an oxidized state. These horizons are minor unconformities and can be used to define till units deposited by a single glacial ice advance. Second, sand and gravel layers mostly occur on the top of geologically related till units and were deposited as outwash by the receding glacier that had deposited the underlying till unit. Third, glacial sand and till units can be defined within similar elevation ranges or regionally sloping elevation ranges.

After the cross sections were produced and correlated, well logs from the study area CWI database were examined within ArcView for the presence of sand and gravel. These sand and gravel records were given unit designations based on the unit boundaries from the nearest cross-section segment. The sand and gravel thickness and elevation per well, for each mapped unit, were then plotted by ArcView and contoured by hand. The result was a draft paper map of sand and gravel distribution in the study area. Finally, the paper map boundaries were digitized with ArcView to create a shapefile.

Maps of sand and gravel distribution were produced with an outwash channel depositional model in mind. The main channel orientations were probably parallel or subparallel to the ice margins, and outwash sediment was contained within linear depressions between higher land to the southwest and the ice to the northeast (Southwick and others, 1993).

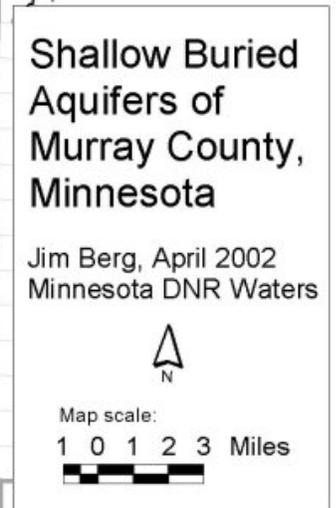
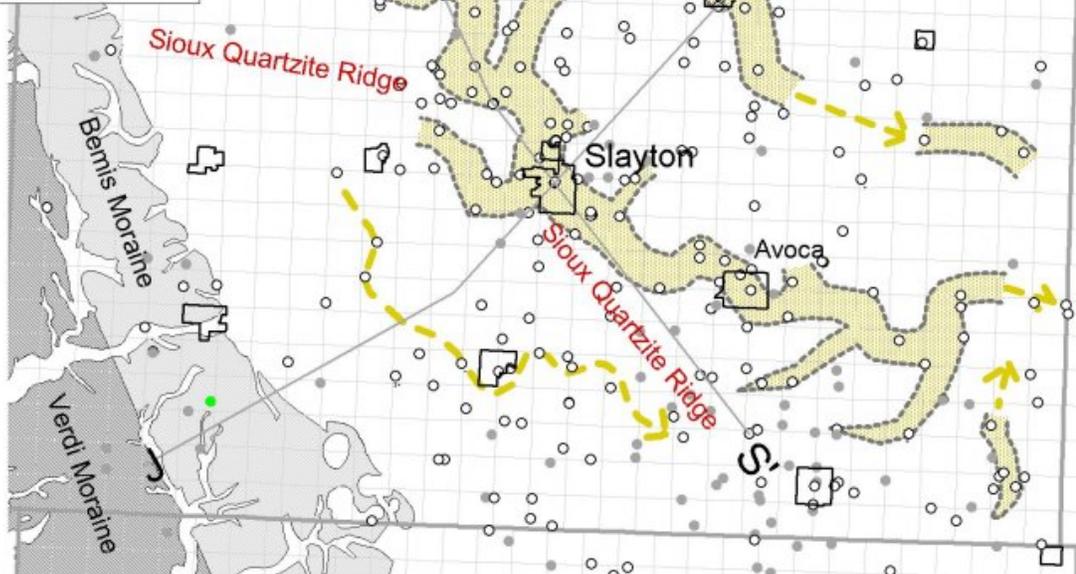
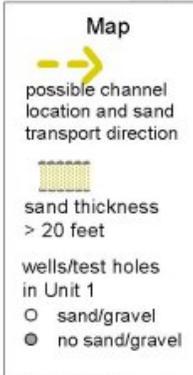
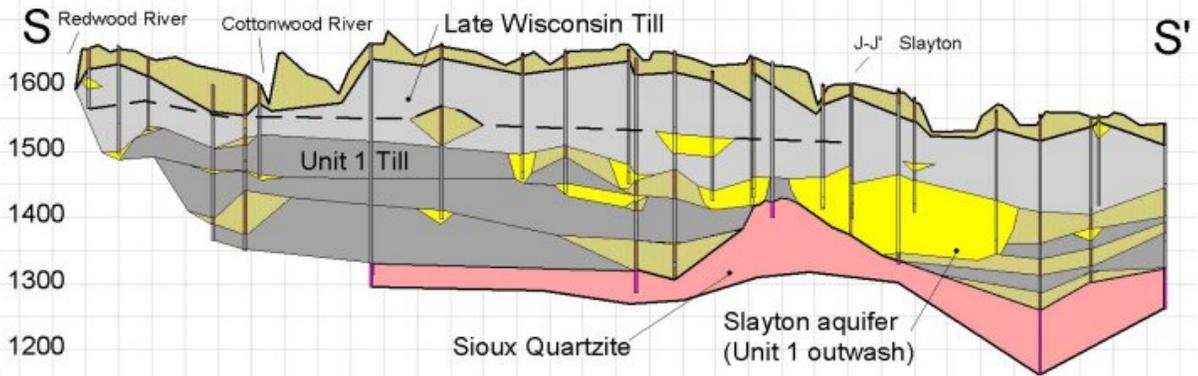
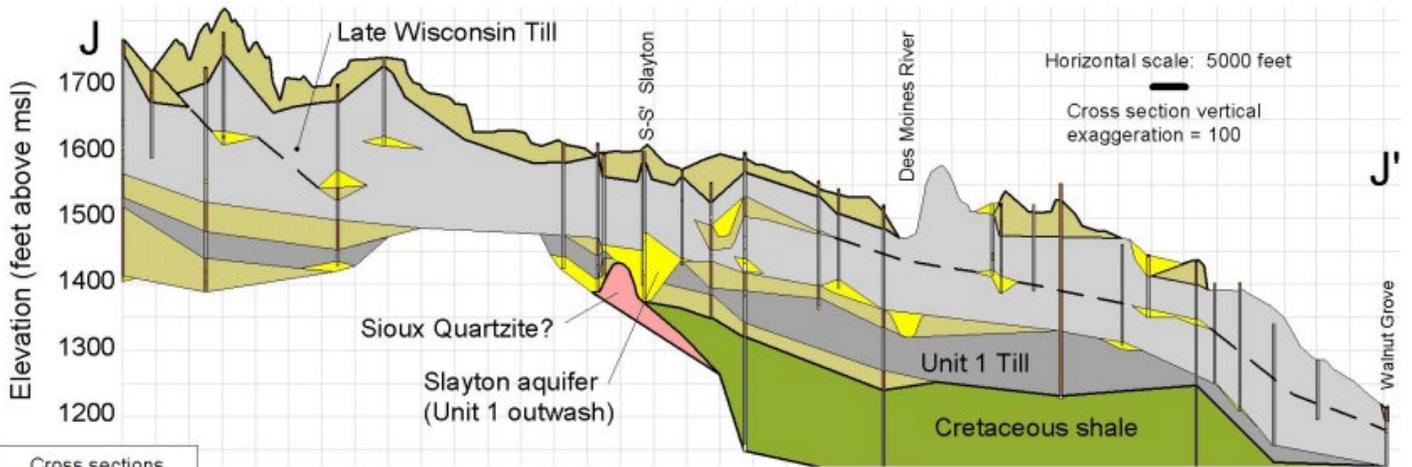
Only the Unit 1 sand and gravel distribution map is shown in this article. A map of the Verdi Unit sand and gravel distribution is included in the full report. The Unit 1 map has only one contour indicating sand thickness greater than 20 feet. This simple representation is mostly due to the limits of the CWI data. The data density was usually not sufficient to predict sand thickness with any greater detail. Also, most of the well logs end within a sand layer rather than at the bottom of the layer in a clay or bedrock layer. Presumably this method of well development was a cost-saving measure by the drillers whose goal was to find a minimum sand thickness for a well screen. Unfortunately, this method results in an incomplete picture of true aquifer thickness in many areas.

Area Stratigraphy and Bedrock Structure

Six glacial till units were identified within the study area. This finding is similar to interpretations in this same area by Carrie Patterson, a co-author of the Southwestern Minnesota Regional Hydrogeologic Assessment (Setterholm, 1995). Five of the six glacial till units are shown on cross-section S-S'. The study area is generally underlain by two Late Wisconsin till units associated with ice advances that created the Bemis and Verdi moraines. In many locations, the boundary between these two till units is indistinct due to a lack of oxidized till surfaces. However, enough oxidized till layers and other unit boundaries were identified to allow mapping of sand and gravel associated with the recession of the Verdi ice (map not shown).

The first till and outwash unit beneath the Late Wisconsin glacial sediment is named Unit 1. The relative abundance of oxidized till and sand at this interface makes it a very distinctive marker bed and key datum. Cross-section S-S' illustrates how widespread and useful this layer is in determining the area stratigraphy. Possibly the thickest and most laterally extensive aquifers in the area are associated with this layer. Some of the thickest sand and gravel

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Murray County, cont.

occurrences associated with this layer are shown on cross-section S-S' in the Slayton area.

The deposition of the Unit 1 sand appears to have been controlled by the structure of the underlying Sioux Quartzite. Two major buried bedrock ridges run northwest to southeast in southern Murray County. The crests of the ridges are labeled on the Unit 1 sand distribution map. The cross sections show that this ridge was exposed or possibly influenced the area topography during the deposition of the Unit 1 sand. The Unit 1 sand was commonly found from 150 to 200 feet below land surface in the area. The elevations of the sand channels ranged from 1300 to 1550 feet above sea level. Some of the other underlying units are also associated with thick sand layers, but sand distribution maps for these deeper units have not been created because of inadequate density of well data.

Conclusions and Future Work

Some unique geological circumstances may have created the opportunity for ground-water resources in Murray County that are not generally available in other parts of the region. For instance, the Sioux Quartzite ridge appears to have been an important depositional control for the Unit 1 sand; however, similar bedrock control structures do not appear to have influenced sand deposition in Rock, Pipestone, or Nobles counties (Berg, 1997).

This project represents a first effort to define, in detail, some significant ground-water resource potential in the area. Due to the incomplete nature of the lithology log data, a great deal of uncertainty still exists regarding the locations of the very thickest portions of these aquifers. The reliability of channel boundaries is especially poor southeast of Avoca since many of the wells were too shallow to penetrate the entire thickness of the Unit 1 sand. We are planning to drill 2 test holes in this area this year to help define the southeastern extent of this Slayton aquifer.

We have also submitted a proposal to the Legislative Commission on Minnesota Resources (LCMR) to complete a more intensive exploration project in the county. Other research in the future should include aquifer tests and some kind of recharge analysis since little is known about the capacity of area aquifers to sustain large-capacity pumping. . With increasing interest in biodiesel, ethanol, and other uses of agricultural products, all of which require water to process, new and better information about possible water sources in the region is especially important now.

The report titled Shallow Buried Aquifers of Murray County, Minnesota, Technical Paper 12, became available this spring. The paper is available at <http://www.dnr.state.mn.us/publications/waters/index.html>

A limited number of paper copies are available from the author: James A. Berg, DNR Waters, Ground Water Unit, 500 Lafayette Road, St. Paul MN 55155-4032.

References

- Berg, James A., 1997, Southwestern Minnesota groundwater exploration project 1996-1997, progress report and final report: St. Paul, Minnesota Department of Natural Resources, 15 p. and 3 appendices.
- Setterholm, Dale R., project manager, 1995, Regional hydrogeologic assessment, southwestern Minnesota: Minnesota Geological Survey Regional Hydrogeologic Assessment Series RHA-2, Pt. A, 2 pls., scale 1:200,000.
- Southwick, D.L., Setterholm, Dale R., Runkel, Anthony J., Patterson, Carrie J., and Chandler, Val W., 1993, Scientific test drilling, 1989-1992, descriptions and interpretations pertinent to the bedrock geology and Quaternary hydrogeology of southwestern Minnesota, Minnesota Geological Survey Information Circular 39: St. Paul, University of Minnesota, 63 p.

MGWA Foundation – When? What? Why?

When the MGWA was created some 20 years ago, the programs and activities organized and presented by the Association were typically hoped to be at least break-even events. There were occasional large events that were successful in generating funds to provide a cushion for lesser events and underwrite the costs of the summer hog roast or refreshments at subsequent events. As the membership grew and large events designed to appeal to a wider audience became the norm, these activities began to generate revenues that allowed the MGWA general funds to grow.

Initially, efforts were made to distribute funds to various earth science departments and classes to underwrite field trips, support student participation at conferences, and other educational activities. As the availability of the funds was publicized, the requests for funding grew and the funds generated by MGWA activities also grew.

In the late Spring and Summer of 2000 the MGWA Board undertook the creation and founding of the Minnesota Ground Water Association Foundation to manage the funding base and the funding of support activities. Establishment of the Foundation also assured that all donations and funding would qualify for tax exempt status and that future fund raising efforts would comply with all of the legal and financial requirements to maintain tax exempt status.

The Foundation goals are to manage and grow the funding base to allow the continued underwriting and support of student education, public awareness, support of teacher's and other professional's participation in educational activities, and support of activities related to professional development. The ultimate goal is to develop an endowed fund that would provide a continuing level of funding for support of the target activities. The current Foundation Board includes Gordie Hess (president), Dave Kill (treasurer), and MGWA

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MGWA Foundation, cont.

past-president Jim Stark. The Board works closely with the MGWA Education Committee to identify and provide financial support to educational undertakings such as the Children's Water Festival.

The Foundation fund base had grown to more than \$20K consisting primarily of monies transferred from the MGWA to the Foundation. In the coming months, various fund raising ventures are under consideration including a golf event, silent auctions at future MGWA events (hog roast, fall field trip, fall conference).

Of course the foundation is always receptive to donations and suggestions for other fund raising activities. Perhaps the simplest and best way to support the Foundation is by continuing your attendance at MGWA events. The profits from these events are directed to the Foundation and made part of the endowment fund. The Foundation Board hopes you will continue to see the value in future MGWA activities and programs that will allow the foundation to continue our support of educational opportunities for students and general public as a whole.

The Foundation Board is open and receptive to any and all ideas for fund raising activities as well as looking for your suggestions and ideas to identify organizations and activities that may be appropriate for Foundation financial support. The targets are of course organizations and activities that provide and support education on ground water issues and public awareness of water and ground water resources.

The Foundation will continue to provide periodic financial reports on their fundraising and distribution activities in subsequent editions of the newsletter. If you have any questions or suggestions please feel free to contact me via e-mail at gness@arcadis-us.com.

— Gordie Hess, Minnesota Ground Water Association Foundation President

Water quality strategies in Minnesota River Basin Plan include ground water protection

Back in 1992 Governor Arne Carlson stood on the banks of the Minnesota River and issued a challenge: Let's clean up the river in 10 years. Looking at the river's murky waters today it may not appear so, but much has been accomplished. Local, state, and federal government and other organizations continue working toward the goal of "fishable and swimmable" waters.

There is some evidence of reduced sediment. Several large wastewater treatment plants have reduced phosphorus levels. Citizen groups have organized and mobilized to clean up the river. The stage has been set for the next phase.

Past research tells us what and where the pollution problems are. Now work is shifting toward actual projects to improve water quality. The Minnesota River Basin Plan, recently completed by the Minnesota Pollution Control Agency (MPCA), offers a guide for continuing the effort.

Copies of the 114-page Minnesota River Basin Plan soon will be available from the MPCA. It's accessible now on the Web at www.pca.state.mn.us/water/basins/mnriver. The plan builds upon past research and looks to the future. It incorporates ideas and comments from many public, private, state and local groups.

The overall goal of the basin plan is: "To restore, protect and maintain the water quality, biodiversity and the natural beauty of the Minnesota River." The plan lists strategies and specific tasks aimed at the goal.

"The plan sets a general direction for further improvements in water quality in the Minnesota River Basin," says Larry Gunderson of the MPCA. "The five-year plan is not intended to be a final product, but part of a continuous process."

Ground water protection

While surface water is the main focus of the basin plan, one of the action strategies states: "Protect, maintain,

and restore the quality and quantity of ground water in the Minnesota River Basin."

The main objective will be to increase the number of communities with an approved wellhead or source water protection plan. As of 2000, 34 communities in the basin are in the wellhead protection program. The plan's target is to have 67 communities in the program by 2005.

Ground water quality in the basin varies by region and aquifer. In some areas in the western part of the Basin, individuals rely on shallow bedrock aquifers, which often have elevated nitrate concentrations. Many municipalities in these areas draw water from deeper bedrock aquifers; however water from these deeper aquifers frequently has high concentrations of iron, manganese, sulfate, and arsenic.

In the central and eastern part of the Basin, individuals and communities draw water from alluvial, glacial, and Cretaceous-age aquifers. Water from these aquifers also may have elevated concentrations of arsenic, iron, manganese, and sulfate. Some individuals in the southwest part of the Basin rely on water from the Sioux Quartzite aquifer.

Sufficient supplies also are a problem in the southwest part of the state. Rural water systems are being used due to a lack of good quality drinking water. Some of the pollutant sources that pose a threat to ground water include industrial disposal, improper application of pesticides and fertilizers, former dumps, landfills and hazardous waste disposal.

Some specific tasks in the basin plan's ground water section include:

- Work with the Minnesota Department of Health (MDH) to review the MDH public water supply database to identify which aquifers have elevated concentrations of constituents of concern including nitrate, iron, manganese, sulfate, arsenic and pathogens.
- The MPCA will complete a list of regional and statewide ground water information resources for local government. Information on

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Basin Plan, cont.

geology and hydrogeology will be included. Local government can add county or watershed specific information.

- Provide assistance in education efforts including best management practices for fertilizer, manure, and pesticide application, feedlot operations, irrigation, petroleum storage, and other activities that may be present in a well-head or source water protection area.
- Promote basin-wide interaction of interagency ground water programs with the goal of prioritizing efforts. This will efficiently protect and restore ground water resources through MPCA and non-MPCA programs. MPCA programs include Leaking Underground Storage Tanks, Voluntary Investigation and Cleanup, Superfund, Closed Landfill Program, Feedlots, Wastewater, Salvage yards, Solid Waste, agricultural chemical clean ups, and petroleum and chemical storage.

Basin Plan Sections

The Minnesota River Basin Plan is divided into four sections:

- Recognize and address threats to Minnesota's environment.
- Prevent, limit, and clean up pollution.
- Improve government services and collaboration.
- Provide responsive services to citizens and stakeholders.

Each section includes a list of action strategies to achieve the goals.

Dissolved oxygen - Ensure that dissolved oxygen concentrations in surface waters throughout the basin are adequate to fully support designated beneficial uses.

Nutrients - *Phosphorus* - Ensure phosphorus concentrations are low enough to fully support aesthetic (recreational use) and aquatic life goals. *Nitrogen* - Protect human health and the environment from the effects of excessive concentrations of nitrate-nitrogen.

Sediment - Ensure that turbidity and total suspended solids levels are low enough to fully support aesthetic (recreational use) and aquatic life goals.

Toxics - Protect human health and aquatic life from the effects of toxic substances.

Bacteria - Reduce the potential for water-borne disease transmission.

Biology - Improve the health of aquatic communities. Increase biodiversity in natural systems.

Basin Plan Priorities

Maintain progress achieved in improving water quality.

Significant strides have been made in improving water quality since the 1970s. Most pollution problems concerning leaking storage tanks, leaking landfills, and sewage in rivers have been cleaned up. The MPCA intends to maintain this progress through efficient delivery of existing programs in these areas.

Focus efforts on streams not meeting the designated uses of aquatic life and recreation.

Although water quality has improved since the 1970s, in many locations it still does not support the uses of aquatic life and recreation. Efforts will be focused on these non-supporting streams and lakes in the Minnesota River Basin, attempting to move them toward supporting their uses.

Assist local organizations in solving water quality problems important in their watershed.

Watershed projects, local water plans, and other efforts often identify issues important to local communities. In addition to the two priorities emphasized above, the MPCA also considers the concerns of local organizations important.

Basin Management Approach

The Minnesota River Basin Plan uses basin management, a geographically based approach to water quality protection and restoration built around the focus on water. Rather than starting from categories of pollution sources or specific facilities, basin management focuses on the relationship of water resources with land management and its communities. The MPCA is using this approach to

focus on the state's major river basins to help it:

- 1) better identify water quality problems and focus resources on them;
- 2) work with communities to establish shared goals and priorities; and
- 3) develop effective pollutant-reduction strategies.

The basin management approach is meant to complement the programs that already exist. It is an extension and combination of the many current efforts in identifying and correcting the various pollution problems that affect the Minnesota River.

In the coming years, attention in the Minnesota River Basin will move toward implementation. Local planning and changes in practices will set the pace. State government will continue to provide assistance but will be looking toward local government and watershed teams for leadership.

More information on the Minnesota River and the basin plan can be found on the Internet at www.pca.state.mn.us/water/basins/mnriver, or by calling Larry Gunderson at 651-297-3825.

— *Forrest Peterson, MN Pollution Control Agency*

Capillary Fringe, Cont.

www.health.state.mn.us/divs/eh/wells/index.html. Click on well disclosures on the right side column and then click on database.

Another part of 1989 Minnesota Ground Water Protection Act, Minnesota Statutes, section 1031.301, subdivision 1(b) states "a well that is not in use must be sealed unless the property owner has a maintenance permit for the well." The annual fee for a Water Well Maintenance Permit is \$100, which will increase to \$125 effective July 1, 2002. There are also delegated well programs in the cities of Bloomington and Minneapolis and the counties of Blue Earth, Dakota, Goodhue, LeSueur, Mower, Olmsted, Wabasha, Waseca and Winona. The cost for a maintenance permit may vary with those delegated programs.

As part of the well disclosure program at the MDH, we follow up with the

— *continued on next page*

Capillary Fringe, cont.

buyer for any well disclosed as not in use or the status of the well is not provided. We also follow up in cases where it comes to our attention that a well has been disclosed as sealed but we do not have a Well and Boring Sealing Record to verify that the well was properly sealed. We send a Water Well Status Report to the current property owner requesting information on the current status of the well and informing them of the options for the well. For any unused, unsealed well, there are three options: put the well back into use, apply for a maintenance permit or have the well sealed by a licensed well contractor. Since the well disclosure program began, over 280,000 well disclosure certificates have been processed. In the last six years we have investigated or followed up with the buyers on 23,000 wells that were disclosed as not in use.

Upon reading the previous Capillary Fringe article, I was prompted to look into this particular case to see whether a well disclosure certificate had been filed for the property. I located a well disclosure certificate that matched the property description and was signed on November 6, 1998. It disclosed two wells, both not in use. One was located in the southeast corner of the building, the other just north of the northeast corner of the warehouse. I verified that we had received a Well and Boring Sealing Record for each well. The wells were sealed on December 12, 2001, and December 14, 2001, respectively. I confirmed with the property owner that the locations of the wells sealed matched the location of the wells disclosed on the well disclosure certificate.

Now back to those questions. Why wasn't the presence of the wells known in the early stages of the project? The answer is that a well disclosure certificate had been filed and accurately indicated the location of the two wells when the property was sold in 1998. So if it was on the certificate, why weren't the wells sealed in a timely manner? The case of the property at Grove Street and Lafayette Road is an example of a law that was technically followed, but the

intent of the law was not accomplished in a quick time period. Fortunately, in this case, the wells were located and properly sealed, but in other cases a well cannot be located after the demolition has started and we have to resort to a variance on well sealing until such time if ever the well is located.

In response to cases like these, we have revised the well disclosure certificate a number of times to try to make the buyer more aware of their responsibilities regarding any unused and unsealed wells on the property. Unfortunately, during the closing of a sale of property, the well disclosure certificate is just another piece of paper that quickly comes across the table. Although the law requires the signature of the seller or a person representing the seller on the well disclosure certificate, it does not require the signature of the buyer or person representing the buyer, unless the seller or person representing the seller has not signed it. The best time to discuss the matter of an unused, unsealed well is prior to the sale of the property, rather than after the property has been sold. This is a problem especially for land where old buildings are being razed and new ones constructed shortly after the sale of the property.

What can our profession do to help developers, demolition and construction contractors and the general public be more aware of unused and abandoned wells? The well disclosure process requires an ongoing educational effort. Buyers and sellers need to know about the requirement for well disclosure. Though the well disclosure law has been in place for over 10 years, a few realtors still think an unused, unsealed well must be sealed before the sale of a property. There are still buyers who claim they never saw the well disclosure certificate and are not aware of any wells on the property. At the MDH, we will continue to strive to process the well disclosure information sooner and follow up sooner with the buyers, but we need the help of people like you in our profession to inform people of the well disclosure process and the importance of sealing wells whenever the opportunity presents itself.

LCMR Citizen's Survey Results

In November of 2001, the Legislative Commission on Minnesota Resources (LCMR) held meetings in Anoka, Grand Rapids, Little Falls, and Winona to solicit public input on two questions related to the expenditure of approximately \$35 million dollars from the Minnesota Environment and Natural Resources Trust Fund and \$15 million from the Minnesota Future Resources Fund as well as other funds. The questions posed were 1) What issue areas do you think need the most attention? 2) What criteria should be used to determine the Trust Fund expenditures? Summaries of the discussions from the meetings are posted on the LCMR website noted below.

From September through December of 2001, the LCMR used the Internet to solicit public input on future priorities for the environment and natural resources. According to the LCMR website, 650 Minnesota citizens logged on to the LCMR website and answered the question: What issue area do you think needs the most attention? Below is a brief summary from the LCMR website. A more complete summary of the results along with the complete set of comments is posted on the LCMR website.

What issue area do you think needs the most attention?

- Land Use and Open Space: 154
- Energy: 127
- Water Resources: 125
- Environmental Education: 65
- Agriculture: 46
- Wildlife: 42
- Forest Resources: 30
- Recreation: 15
- Fish: 5
- Other, please specify:
 - Exotic Species: 28
 - Enforcement: 4
 - Air Quality: 2
 - Transportation: 2
 - Natural Resource Maintenance Funding: 1

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Ground Water Education Committee Minutes

Date: April 11, 2002

Location: MPCA offices, St. Paul

Present: Cathy Villas-Horns, Mark Ferrey, Jim Lundy, Mike Trojan.

Items discussed

Procedure. Jim Lundy will contact Rob Caho (president) to request a permanent (non-voting) presence by the GW education committee at the regular MGWA board meetings. The committee responsibility to attend board meetings will rotate.

Earth Day. Mark Ferrey and Mike Trojan will attend the Earth Day event (April 18, 2002) sponsored by Olson Middle School in Minneapolis.

Announcement for the MGWA Spring conference, April 23. MGWA president Rob Caho asked Jim Lundy to present a brief update of progress made by the ground water education committee. The major accomplishments listed by the committee are: web page; environmental education clinic; Earth Day participation; cooperation with the Science Museum of Minnesota; and the aborted ground water monitoring project at McCarron's Lake.

Review of pending legislation. Mark Ferrey agreed to attend the May MGWA board meeting to explain the idea of MGWA ground water professional providing unbiased technical review of pending legislation pertaining to ground water. The committee is interested in this idea from the point of view of decision-maker education, and would like to obtain the board's approval to carry the idea forward.

Environmental Education Clinic, May 1. Mike Trojan and several other GW Education committee members are planning to attend on behalf of MGWA. The EE Clinics are geared for environmental educators and people with an interest in environmental education. The overall objectives of these Clinics are to: 1) Share the environmental education resources, programs, etc. available in Minnesota and nationally; 2) Give you the opportunity to build and strengthen networks and share expertise, and; 3) Further environmental education efforts by learning what is underway,

what is needed, what's working, and what's not.

MGWA web page on Ground Water Education. Mike Trojan has done a great job pulling together loads of information pertaining to ground water education on the MGWA web site (www.mgwa.org). He has included information on: GW Education committee activities; resources; water facts and definitions; lesson plans, organized by grade level; educational links. The page is now live, and we welcome comment from the membership.

Items deferred

Science Museum exhibit on ground water. Chris Elvrum and Jim Berg (MDNR) are making progress on this idea, to be discussed at the next meeting.

Karst Community workshops. In May, MPCA will conduct karst community workshops (sponsored by USEPA) in Lanesboro, Mankato, Zumbrota, and Farmington. The organizer (Sandeep Burman, MPCA) has asked whether MGWA is interested in continuing the workshops next year. The USEPA may have grant money to continue the series. Because the curriculum is already written under the current grant, future activities would consist of taking the series to additional communities in SE Minnesota. The education committee needs to consider whether this is a good option, and weigh in with the MGWA board to see if there is support to pursue it.

Training for legislators. Mike Schoenberg is looking into this.

Expansion of the Sea Grant CD-ROM. Chris Elvrum.

Next meetings: Those present decided it would be most efficient to meet about a week prior to the MGWA board meetings. The board meetings are usually scheduled for the first Thursday of each month. Therefore, our next two GW Education committee meetings will be: Thursday May 30, 8:00-9:30AM, MPCA offices
Thursday June 27, 8:00-9:30AM, MPCA offices

Water 2002 Draws Large Crowd to St. Cloud

Approximately 500 water resource professionals from business, industry and government attended Water 2002 at the St. Cloud Civic Center, April 17-20, 2002. This year's conference, *Working Together in a Climate of Change to Manage Minnesota's Water Resources*, was hosted by the University of Minnesota Water Resources Center, the Rivers Council of Minnesota, and the Minnesota Lakes Association. The annual meetings of both the Rivers Council and Lakes Association were held during the last two days of the conference.

The first morning's plenary session began with a Minnesota perspective on global climate change followed by a talk on how the history of global climate change may be interpreted from lake sediment cores. Presenters from Minnesota Planning then discussed the challenges of managing Minnesota's water resources in times of change and Minnesota's recently-developed Water Unification Plan. Details of the plan may be found at the Minnesota Planning web site: <http://www.mnplan.state.mn.us>.

The first day's lunch speaker from the Metropolitan Council described Blueprint 2030, the Council's new regional growth strategy for the next 30 years. Sometime this summer,

— continued on next page

Citizen's Survey, cont.

Recycling: 1

Regional Funding: 1

LCMR is currently holding hearings on selected proposals for FY 0405 funding. More information is available on the LCMR Website (www.commissions.leg.state.mn.us).

Those wishing to personally provide input to the LCMR funding process should know that the Minnesota Environment and Natural Resources Trust Fund Citizen Advisory Committee (CAC) to the LCMR has a vacancy. Applications are available from the Minnesota Secretary of State (www.sos.state.mn.us).

— contributed by Jon Pollock,
Frontline Environmental

Water 2002, cont.

Minnesota will welcome its five millionth resident. The question is not if the Twin Cities Metropolitan Area will grow, but how. The previous concept of a seven-county metro area has now expanded to include at least a dozen counties, including several in western Wisconsin. More emphasis needs to be placed on infilling of poorly-utilized land within the core areas of Minneapolis and St. Paul and the first-ring suburbs that surround them. This is particularly true as the cost of land rises rapidly in outer-ring suburbs and beyond.

Highlights of a few of the talks I attended during the concurrent sessions Wednesday afternoon and Thursday follow. A study of nutrient and pesticide losses from tile drains under a production scale corn-soybean rotation was conducted by the Minnesota Department of Agriculture between 1997 and 2000. The tile system responded very rapidly to some rainfall events, although nitrate concentrations remained nearly constant over storm hydrographs despite significant increases in flow. Movement of four corn-soybean herbicides that were monitored coming out of the tiles varied dramatically.

The St. Croix Watershed Research Station, Science Museum of Minnesota is conducting a study to determine baseflow loading of nutrients to the St. Croix River from Valley and Browns Creeks in eastern Washington County. Both surface and ground water in this area is under increasing threats from expanding urbanization of the Twin Cities Metropolitan Area. Using an automated hydrograph separation method, the study has shown a significant contribution from ground water to streamflow in the two creeks and ultimately to the St. Croix. Annual nutrient outputs of dissolved phosphorus and nitrogen were calculated from average baseflow concentrations. Nitrate was estimated to compose an average of 86% of the dissolved N in Valley Creek and 95% in Browns Creek.

Camp Coldwater Spring, the largest natural spring in Minneapolis, is threatened by construction of a new highway interchange nearby that may

alter ground water flow to the spring and possibly impact its water quality. This issue is a classic example of how to measure the historic and spiritual values of a water resource versus expanding infrastructure needs. Readers are referred to detailed technical discussions of the Camp Coldwater Spring debate in previous issues of the MGWA Newsletter (V. 19, Nos. 3, 4).

Temperature and head measurements beneath surface waters are useful for determining ground water discharge zones at some remediation sites where standard sampling fails to positively determine surface water impacts. New sampling methods have allowed the Minnesota Pollution Control Agency to collect ground water discharge samples within centimeters of the point of discharge, allowing for a quick and inexpensive means of determining the location of contaminant discharge to surface waters. A weblink describing this work in more detail may be found at:

<http://www.pca.state.mn.us/cleanup/gwsw-interaction.html>

Monitoring results for Minnesota's 955 community drinking water systems by the Department of Health have again indicated no major contamination problems or health concerns, however, a number of localized problems were noted. Detectable levels of coliform bacteria were found in 24 systems. While not all coliform bacteria cause illness, they provide an indicator of possible contamination within the system. Systems showing presence of coliform bacteria are routinely disinfected, flushed out and retested to ensure the contamination is gone. Four municipal systems, each serving less than 1500 persons are taking measures designed to reduce contamination by nitrate or nitrite. Only five systems continue to exceed the federal standard for lead, out of 87 that exceeded the standard when testing for lead was begun about ten years ago. Lead levels have been lowered considerably in these systems as controls have been implemented. The MDH report also discusses measures being taken to protect public water supply systems from vandalism, sabotage and acts

of terrorism in the wake of events of September 11. The complete report is available online at:

<http://www.health.state.mn.us/divs/eh/water/cinfo/dwar/report01.html>

In summary, Water 2002 was an interesting and worthwhile conference to attend with a wide variety of subjects covered. Although I did not attend the last two days, the format of piggy-backing the annual Minnesota Lakes Association and Rivers Council Conferences to the biennial Water Conference appeared to be a huge success and may serve as a model for future conferences of this type.

Submitted by Tom Clark, Minnesota Pollution Control Agency

MGWA Spring Conference 2002 – Effective Drilling and Well Techniques

Several inches of snow on the ground just 24 hours before the start of MGWA's spring conference on April 23, 2002 was not a good sign, especially because most of the activities were scheduled to be outdoors. But the temperatures warmed nicely, the snow melted and the conference went off smoothly – thanks in good measure to the organizers, the exhibitors and the host, Johnson Screens.

Johnson Screens in New Brighton was a very gracious host, allowing use of its meeting rooms for the morning presentations, providing tours of its manufacturing facility for all interested attendees, running its high-capacity pumping well for an aquifer test demonstration, and allowing its grounds to be used for drilling demonstrations. Johnson's hospitality is appreciated by all of us who attended. During the tour, we learned Johnson markets its products worldwide, and its product applications extend far beyond water wells.

Over 200 people attended the conference. The morning sessions included a presentation of the 2002 MGWA Outstanding Service Award to Dr. Matt S. Walton, the former director of the Minnesota Geological Survey. Dr.

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— Boart Longyear's rotasonic rig draws a crowd (Photo by Sean Hunt).



— John Schneiders of Water Systems Engineering delivering the 2001-2002 McElhinney Distinguished Lecture (Photo by Sean Hunt).



— It was a full house for the morning sessions (Photo by Sean Hunt).

Spring Conference, cont.

Walton was honored for the leadership he provided as director of the MGS, and the foresight he provided in establishing and securing on-going support for activities such as the county well index and the geologic atlas program.

The keynote speaker for the conference was John H. Schnieders of Water Systems Engineering, Inc. Mr. Schnieders presented the 2001-2002 McElhinney Distinguished Lecture, the subject of which was chemical rehabilitation of wells. During this presentation, Mr. Schnieders reviewed some of the chemicals used for well cleaning, discussed mineralization and biological fouling, provided guidance on how to determine the correct amount of acids and enhancers, and examined mechanical applications and why they are necessary.

After the morning presentations to the entire conference audience, a series of breakout sessions were scheduled in which conference participants migrated from demonstration of drilling technologies, to factory tours, to aquifer testing. Bergerson-Caswell, Boart Longyear, Layne Christiansen, Traut Wells, MATRIX Environmental, and Braun Environmental each made presentations of some of the drilling technologies they use in their work. Techniques demonstrated by these firms included cable tool, rotasonic, dual reverse air, large diameter rotary, direct push probing, and hollow stem auger. DNR staff demonstrated aquifer testing techniques.

The hands-on nature of the conference was a welcome change from typical conferences, and fortunately, the weather cooperated.

— Photos continue on next page





— Bergerson Caswell's cable tool rig (Photo by Sean Hunt).



— Jay Frischman and Mike Liljegren, DNR Waters, demonstrate aquifer testing techniques. Production well in background. (Photo by Steve Robertson)

MGWA Welcomes Liesch Associates Inc. and Legette Brashears and Graham as New Corporate Members

MGWA's new corporate membership program has a two new members, Liesch Associates, Inc. and Legette Brashears and Graham. Liesch's new ad is on page 23; look for the new LBG ad in the September issue.

Our list of corporate members:

Howard R. Green
Interpoll, Inc.
Environmental Strategies Corp
Liesch Associates, Inc.
Legette Brashears and Graham

Revision of the Health Risk Limits for Groundwater Rule

The Minnesota Department of Health (MDH) is in the process of revising the Health Risk Limits (HRLs) for the groundwater rule. HRLs are used to evaluate whether water from private wells and sites under investigation can be safely consumed and to set cleanup goals. HRLs may also be used to evaluate levels of contaminants in water from public systems if there are no federal standards for those contaminants. In contrast to federal Maximum Contaminant Levels (MCLs), which govern public water systems and include a

MDH HRL Revisions, cont.

consideration of feasibility and economics, HRLs are strictly health-based. Therefore, a contaminant may have both a HRL and an MCL and the numbers may differ.

Over 220 chemicals are being evaluated as part of the revision. The list of chemicals slated for evaluation includes all existing HRL chemicals; chemicals for which the MDH has developed unpromulgated Health Based Values (HBVs) as guidelines at the request of other agencies; and additional chemicals that have been found in Minnesota's groundwater. The HRL rule, authorized by the Groundwater Protection Act of 1989, has not been revised since HRLs for 32 chemicals were added to the original list of 88 in 1994.

The revision will encompass not only a research and review of toxicological data for each chemical, but also a reevaluation of many traditional risk assessment assumptions, a focus on children, and attention to the new health standards statute, Mn. Stat. §144.0751. Most existing HRLs and HBVs are derived from information on the Environmental Protection Agency's flagship toxicology database, the Integrated Risk Information System (IRIS). Toxicity data from recent studies may not be reflected on IRIS. MDH will be identifying and evaluating toxicity data from sources in addition to IRIS in an effort to ensure that recent advances in toxicological knowledge have been incorporated in the revised HRLs.

The HRLs incorporate a number of assumptions that have been standard in the field of risk assessment. MDH staff have examined how certain assumptions developed. For example, a relative source contribution, or RSC, of 20% is generally applied to reduce the level of a contaminant permitted in drinking water in order to account for the fact that there may be other sources of exposure. MDH staff have examined how certain assumptions developed and have also questioned whether, given accumulating toxicological information, certain standard assumptions can still be justified.

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MDH HRL Revisions, cont.

Assumptions of particular interest include a cap of 10 on the factor applied for sensitivity between humans; the assumption that no amount of a carcinogen is without risk; and the assumption that cancer is the result of a lifetime of exposure.

The focus on children will address both children's potential for higher exposures and their potential for greater susceptibility. The potential for higher exposure arises from children's higher intake rates relative to body weight and from their unique behaviors. The potential for greater susceptibility arises because children's systems are still developing. These developing systems provide unique targets; thus children will be more vulnerable to chemicals that impact these targets. Because certain development processes may be misdirected or arrested, the effects may be life-long. Metabolic processes that function in adults to detoxify chemicals may not be fully functional in children. Conversely, some metabolic processes actually make some substances more toxic. If these processes are not fully functional in children, they will be less susceptible to the toxic effects of these chemicals.

Finally, MDH will respond to the health standards statute that the Minnesota legislature passed last year. This statute requires that water standards include a reasonable margin of safety to protect infants, children, and adults against a variety of specified health outcomes.

With the help of stakeholders, MDH staff have identified issues to be researched and concerns to be addressed in the revision. Staff are reviewing toxicological data for each chemical in the revision. Staff are also evaluating risk assessment techniques and default assumptions to determine whether science or policy advise modification of existing techniques and assumptions. Late in 2002 or early in 2003, staff expect to present the issues, research results, and recommendations to an advisory committee. The committee will be asked to provide technical expertise to the MDH in resolving questions

about risk assessment, science, and policy. While MDH may request assistance from the committee in resolving questions about specific chemicals, a chemical-by-chemical review is not anticipated. The committee will meet for no more than one year. With the benefit of the committee's advice, the MDH will proceed to rulemaking.

Because of the pace at which risk assessment research is advancing, not all issues considered will be addressed in this revision. If all goes well, MDH will embark on a more frequent schedule of revision, which will be better able to keep pace with research and will better meet the needs of Minnesotans.

An update on the HRL revision is available on the web at <http://www.health.state.mn.us/divs/eh/groundwater/hrlgw/index.html>.

— Anne Kukowski, MDH

Update on the Baytown Township Groundwater Contamination Site

The Baytown Township Groundwater Contamination Site is located in Washington County, Minnesota, and begins just west of the Lake Elmo Airport and extends eastward to the city of Bayport and the St. Croix River. The entire area of groundwater contamination is approximately six square miles, and the site is listed on both the state and federal Superfund lists. The main contaminant found is trichloroethylene (TCE). TCE was commonly used for metal cleaning and degreasing, and as a dry cleaning solvent.

TCE was first found in the groundwater in the area in 1987. Additional well sampling showed TCE contamination across a wide area. This area included portions of Lake Elmo, Baytown and West Lakeland Townships, and Bayport. In 1988 the Minnesota Department of Health (MDH) issued a well-drilling advisory for portions of West Lakeland Township, Baytown Township, and the city of Bayport. This advisory puts limits on the construction of new wells, and requires testing of new wells for TCE. The well drilling advisory, now known

as a "Special Well Construction Area," remains in effect. It has recently been expanded to reflect the spreading of the TCE plume.

The highest levels of TCE have been found in groundwater beneath the Lake Elmo Airport. For this reason, the Minnesota Pollution Control Agency (MPCA) requested that the Metropolitan Airports Commission (MAC), the owners of the airport, conduct an investigation and address the contamination. MAC agreed to do so, and entered into a formal agreement with the MPCA in 2000.

Water samples have been collected periodically from several hundred private wells in the area to monitor the TCE plume. The most complete sampling of wells in the area occurred in the spring and fall of 1999. MAC's consultant, Wenck Associates, Inc., sampled about 300 private wells to monitor levels of contaminants in wells that had been previously affected and also identify any new wells that may have become contaminated. The sampling results showed that levels of TCE continue to be highest at the Lake Elmo Airport and immediately to the east. TCE levels increased in some wells and decreased in others. A number of new wells were also found to have TCE contamination.

As of December 2001, thirteen wells at or near the Lake Elmo Airport had levels of TCE that were higher than the current MDH Health Risk Limit (HRL) of 30 micrograms per liter (30 g/L). Whole-house granular activated carbon (GAC) filters were installed by MAC to remove the TCE from all of the water used in these homes, not just the water from one sink or appliance.

Long-term exposure to high levels of TCE (much higher than has been seen at the Baytown site) in drinking water can damage the liver, kidney, immune system, and the nervous system. TCE may also harm a developing fetus if the mother drinks water containing high levels of TCE. Some studies suggest that exposure to lower levels of TCE over many years may be linked to an increased risk of several types of cancer. Because

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Baytown update, cont.

TCE evaporates easily from water, exposure can also occur from inhaling the vapor. TCE may evaporate from water during such activities as bathing, showering, doing dishes, or flushing a toilet.

The scientific information we have about the health effects of TCE comes from studies of people exposed to high levels in the workplace and from studies of animals exposed to high levels in air or water. The U.S. Environmental Protection Agency (EPA) recently re-evaluated existing and new scientific information. EPA concluded that TCE may be more toxic than previously thought and issued a revised draft health risk assessment for TCE in late 2001.

In response to the draft EPA health risk assessment for TCE, in early 2002 MDH recommended an exposure limit of 5 µg/L TCE be used in place of the existing MDH HRL of 30 µg/L for drinking water from private wells. This new exposure limit is also consistent with the federal Maximum

Contaminant Limit (MCL) for TCE for public water supplies. The existing HRL for TCE was established in the early 1990s, and was based on the best available scientific information at that time. MDH is in the process of revising the HRLs for all contaminants (see related article); a new HRL for TCE (which may be different than 5 µg/L) will be adopted as a part of that process.

The change in the recommended exposure limit triggered a massive response on the part of MDH, MPCA, and MAC. An initial mailing containing a cover letter, information sheet, and past well sampling results was mailed to nearly 1,000 homes in the affected area in mid-February. MDH, MPCA, and Washington County hosted a public availability session at Oak-Land Junior High School on February 27, 2002. Over 500 people attended the meeting, which consisted of an extended "open house" and presentations by agency staff. Since then, hundreds of phone calls from concerned residents have been fielded by staff from MDH, MPCA,

MAC, and Washington County. Media coverage has been ongoing, and generally positive.

In response to the new recommended exposure limit for TCE in private wells, MDH, MPCA and Washington County are working closely with MAC to make sure the public's health is protected. The following response actions are underway:

- All property owners with wells that have more than 5 µmg/L (but less than 30 µg/L) of TCE have been notified. These wells (over 100 at last count) are being fitted by MAC with a whole-house GAC filter. This ensures that exposure to TCE is minimized. Bottled water is being provided by the MPCA in the interim.
- Wells that have shown levels of TCE less than 5 µg/L in the past are being re-sampled to determine if the concentration of TCE now exceeds 5 µg/L. If any of these wells are found to exceed 5

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2002 Minnesota Ground Water Association Newsletter Advertising Policy

Display ads:

Size	Inches Hor. x Vert.	Quarterly Newsletter Annual Rate; 4 issues	2002 Membership Directory Annual Rate; 1 issue
Business Card	3.5 x 2.3	\$66	\$50
Quarter Page	3.5 x 4.8	\$121	\$99
Half Page	7.5 x 4.8	\$225	\$190
Full Page	7.5 x 9.75	\$425	\$360
Inside Cover	7.5 x 9.75	not available	\$395

Classified ads: Classified ads in the newsletter are charged at the rate of \$3 per 45 characters (including spaces and punctuation) per newsletter issue.

E-mail notices: A one-time e-mailing to the membership costs \$10 for an individual (e.g., seeking a job), and \$50 for an organization (e.g., announcing a new product, job opening etc.). A 200 word limit is imposed. The advantage of e-mail is the speed of dissemination.

The Advertising Manager has final determination on the acceptance of materials submitted. There are no commissions on ads. Copy must be received by the publication deadlines: 1 February, 1 May, 1 August, or 1 November. Advertisers should submit their material as a digital file in TIFF, JPEG or PCX format at 300 to 600 dpi. A set-up charge will be applied to non-digital ad material.

Please make checks payable to "Minnesota Ground Water Association" or "MGWA." Direct your orders and questions concerning advertising rates and policy to the Advertising Manager: Jim Aiken, Advertising Manager, c/o MGWA, 4779 126th Street, White Bear Lake MN 55110-5910; Phone (952)361-4944 ; jaiken@mn.rr.com.

Baytown update, cont.

g/L, they will also be fitted with a whole-house GAC filter.

Additional well sampling will be conducted over the next year throughout the affected area to determine if any other wells are approaching the new exposure limit for TCE. More frequent monitoring of impacted wells will also take place.

Long-term solutions, such as the installation of deeper wells, expansion of existing public water supply systems, or community water supply systems are also being explored with federal, state, and local officials.

Further information on the Baytown Township Groundwater Contamination Site can be found on the MDH web site at:

Notice of Special Well Construction Area Revision

On May 6, 1988, the Minnesota Department of Health (MDH) issued a "Well Advisory" now known as a "Special Well Construction Area," for parts of Baytown Township, West Lakeland Township, and the city of Bayport, in Washington County, Minnesota in response to the discovery of volatile organic chemical (VOC) contaminants in several private wells in the area. The contaminants initially detected included trichlorethylene, carbon tetrachloride, tetrachloroethylene, and cis-1,2, dichloroethylene. The advisory placed special restrictions on the construction of new wells within the well advisory boundary, and required that well owners conduct additional water testing prior to completing and placing a new well into service. The additional construction and water testing requirements were established to assure that persons are not exposed to levels of contamination that exceed health exposure guidelines.

The primary contaminant now present in the ground water within the Special Well Construction Area is trichlorethylene (TCE). The highest concentrations of TCE are present

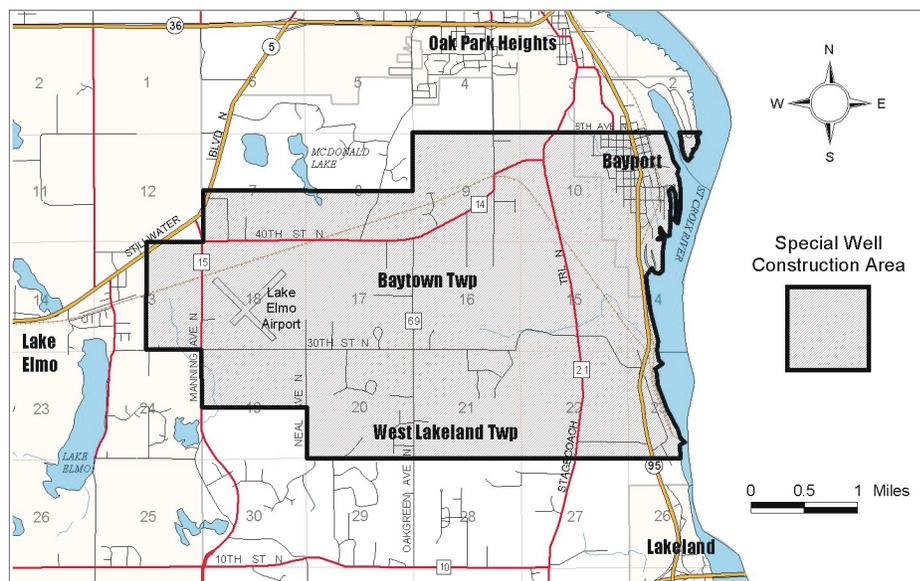
This Newsletter brought to you by:

<i>Norm Mofjeld, Editor-In-Chief</i>	<i>norman.mofjeld@health.state.mn.us</i>
<i>Tom Clark</i>	<i>tom.p.clark@pca.state.mn.us</i>
<i>Steve Robertson</i>	<i>steve.robertson@health.state.mn.us</i>
<i>Jan Falteisek</i>	<i>jan.falteisek@dnr.state.mn.us</i>
<i>Jim Lundy</i>	<i>jim.lundy@pca.state.mn.us</i>
<i>Jon Pollock</i>	<i>frontline@uscorp.net</i>
<i>Aaron Fredrikson</i>	<i>aarmatfre@yahoo.com</i>

Remaining MGWA Newsletter Deadlines for 2002

Issue	Copy to Editor	Copy to Publisher
September (Vol. 21 No. 3)	08/16/02	08/23/02
December (Vol. 21 No. 4)	11/15/02	11/22/02

Special Well Construction Area
Covering Portions of Baytown and West Lakeland Townships
and Portions of the Cities of Bayport and Lake Elmo



underneath Lake Elmo Airport in the Prairie du Chien limestone aquifer, and northeast of the airport in the Jordan sandstone aquifer. Carbon tetrachloride, tetrachloroethylene, and dichloroethylene are no longer being detected in water samples from the area. Recent water sampling by the Minnesota Pollution Control Agency (MPCA) and the Metropolitan Airports Commission (MAC) has revealed that low levels of TCE are present in private wells outside the original well advisory boundary. In response to this new information, the MDH has changed the Special Well Construction Area Boundary to include these new areas effective February 15,

2002. The area that were added include: the east half of Section 13, Township 29 North, Range 21 West, Lake Elmo, Washington County, Minnesota; and the south halves of Sections 20, 21, 22 and 23, Township 29 North, Range 20 West, West Lakeland Township, Washington County, Minnesota.

For more information contact Pat Sarafolean, MDH, at 651-643-2110; Ronald Thompson, MDH, at 651-643-2108; Richard Baxter, MPCA, 651-297-8471; or Kurt Schroeder, MPCA, at 651-296-8593. For health risk questions, contact Jim Kelly, MDH, at 651-215-0913.

Otter Tail Area Regional Hydrogeologic Assessment Completed

Part B (hydrogeology and pollution sensitivity) of the Otter Tail Area Regional Hydrogeologic Assessment is now available. DNR Waters recently published the map report that will join Part A (surficial geology and Quaternary stratigraphy) published by the Minnesota Geological Survey in 1999. The Otter Tail area report is a systematic study of a portion of west-central Minnesota that includes some regionally important surficial and buried aquifers. Work on Part A has improved understanding of the glacial history of the area and the relationship of ground-water resources to glacial events. Other studies underway in the region include the Pope County Geologic Atlas and the Traverse-Grant Regional Hydrogeologic Assessment.

Study Area



Part A of the assessment is online (GIS data and PDF images of the two plates) from the Minnesota Geological Survey at <ftp://156.98.153.1/pub2/rha-5/>.

Part B of the assessment is online (GIS data and PDF images of the two plates) from DNR Waters at http://www.dnr.state.mn.us/waters/programs/gw_section/cgarha/platesum/otrha.html.

To order the printed report of the Otter Tail RHA, contact the Minnesota Geological Survey, Maps and Publication Sales, at 612-627-4782. For

more information on the County Geologic Atlas and Regional Hydrogeologic Assessment Program contact the Minnesota Geological Survey at 612-627-4780 or DNR Waters at 651-296-4800.

Highlights of Part B

Age dating. Part B of the Otter Tail study focused on the ground water in

the scarps of buried or surficial outwash channels. Several smaller kettle lakes occur in the hummocky moraine setting. Stable isotope data (see Figure 1) indicated that lake water was influencing ground water sampled from a well at Cotton Lake (in collapsed outwash northeast of Detroit Lakes) and a well at Anna Lake (in hummocky moraine north-

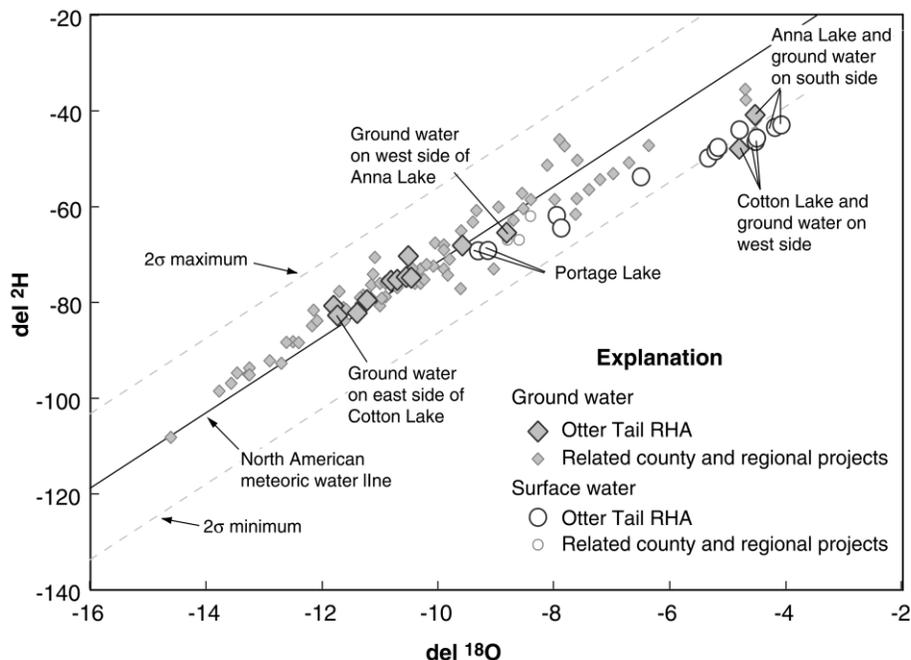


Figure 1. Stable isotope data from the Otter Tail study and related assessment and atlas projects plotted on a portion of the North American meteoric water line.

the Quaternary sediments covering the area, to a depth of several hundred feet. Isotopic analysis of 74 ground water samples showed that tritium was commonly found to depths of 100 feet or more, but varied by hydrogeologic setting. Eight ground-water samples from wells as deep as 537 feet were analyzed for residence time using carbon-14. Some of these samples indicated ground water at relatively shallow depths was thousands of years old. The oldest ground water analyzed was 8,000 years old at a depth of 245 feet in the high-relief, collapsed glacial deposits of southeastern Becker County.

Lake- and ground-water interaction. Because of the extensive lakes system in the study area, special attention was given to the interactions of lakes and ground water. Many of the large lakes lie between

west of Battle Lake). These two ground-water samples were found to have an evaporative signature similar to the corresponding lake-water samples. At sites on the opposite sides of these lakes no lake-water influence was detected from comparison of stable isotopes. Isotopic data from other lake water samples, such as Portage Lake in outwash plain northwest of Park Rapids, plotted closer to the meteoric water line indicating a shorter residence time or less ground-water influence.

Recharge sources. The application of road salt, agricultural fertilizer, and water softening processes result in chloride concentrations in ground water that are significantly higher than in precipitation. Furthermore, infiltrating anhydrous ammonia (also from fertilizers) and ammonia (from

— continued on next page

Ottertail HRA, cont.

animal manure) exchange with calcium and magnesium cations that are in clay minerals, releasing these cations into the ground water. Strontium, a cation with a very strong bond to clay minerals, remains in the clay. Figure 2 shows a plot of chloride concentrations to the ratio of strontium to calcium plus magnesium that has been interpreted for recharge source. Human impact on ground water, as seen in the portion of the graph labeled as enhanced recharge, is indicated by higher chloride concentrations accompanied by lower concentrations of strontium compared to calcium and magnesium. The wetland environment provides relatively small evaporative concentration of chloride resulting in chloride concentrations only slightly higher than precipitation. Native plants in upland soils can transpire most of the available water, leading to higher chloride concentrations in the ground water. These study data indicate wetlands represent a significant source for ground water recharge in the Otter Tail study area and that preservation of wetlands can help recharge future ground water supplies.

Mapping contaminant discharge to surface water at remediation sites

Jim Lundy, MPCA

At many remediation sites it is difficult to accurately assess plume impacts to surface waters. Samples from lakes and streams may not be well mixed with respect to contaminant discharge. Monitoring well samples may represent aquifer conditions better than pore water quality just prior to discharge. During 2001, Minnesota Pollution Control Agency (MPCA) staff investigated techniques for identifying zones of strong ground water discharge to surface water, and measuring for ground water contaminants in these zones.

Techniques for finding discharging ground water are not new, and consist of three types: contrast between surface and pore water temperatures; head differences between surface and pore waters; and seepage rates between surface and ground waters. These three measurements can be used to map areas of upward

discharging ground water versus downward discharging surface water.

Locations within the expected plume discharge zone coinciding with upward discharging ground water become possible pore water sampling points. Pore water samples can be accurately and conveniently collected using inexpensive, reusable stainless steel samplers. Discharge of contamination to surface water is indicated by contamination present in pore water samples collected within 20 cm of the end of upward discharging ground water flow paths. Pore water quality combined with seepage rate gives contaminant mass-flux to the surface water.

MPCA staff visited 16 sites during 2001. Some of the results are displayed at a new web page at the MPCA web site (<http://www.pca.state.mn.us/cleanup/gwsw-interaction.html>). The page includes photographs and data from several example projects. Contact Jim Lundy (651-296-7822; jim.lundy@pca.state.mn.us) with questions.

2002 Brown-Nicollet-Cottonwood Children's Water Festival a Success

On March 11, 2002 over 1,100 fourth graders, teachers and chaperones from 49 schools were welcomed to the South Central Technical College campus for the annual Brown-Nicollet-Cottonwood Children's Water Festival. Presentations included MPCA's famous mercury detecting dog, Clancy, trained by Carol Hubbard; Stream Flow; Ground Water Contamination and Migration; Water Reduction & Recycling; and Caves and Water Under the Ground.

The event's success was due to many people and organizations including the Austin J.C. Hormel Nature Center, Minnesota Science Museum, local musician and environmental advocate Scott Sparlin, DNR, MDH, U of MN Extension, OEA, MDA, MPCA, Gustavus Adolphus College, MN Rural Water Association, local county staff, and law enforcement staff.

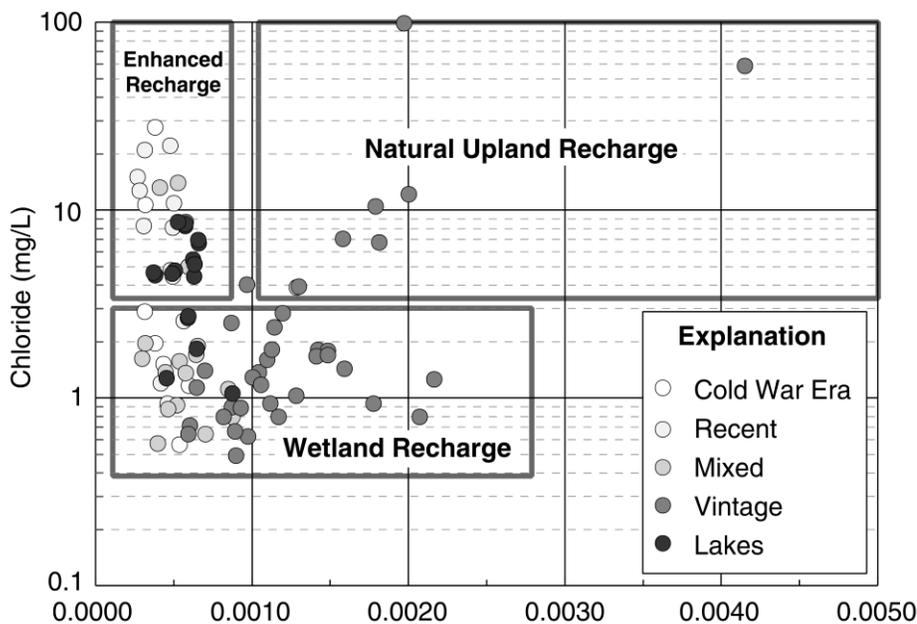


Figure 2. Recharge environment based on comparison of chloride concentration to the molar ratio of strontium (Sr) to calcium (Ca) plus magnesium (Mg). The ground-water samples are shown with their tritium ages. Cold War Era water, which has unusually high tritium values, infiltrated the ground during the 1950's and 1960's. Recent water entered the ground since 1953. Vintage water is more than 50 years old.

The Encyclopedia of Water

In spite of the emergence of the Internet as an electronic fact-finding source, the old-fashioned hard-copy encyclopedia is still alive and well!

The Encyclopedia of Water, edited by Dr. Jay H. Lehr (Editor in Chief), Jack Keeley (Senior Editor) and Janet Lehr (Associate Editor) will contain over 2000 entries which will be submitted by scientists, educators and water professionals worldwide. The compiled work to be published in 2004 will be the largest and most comprehensive assortment of information on water ever created.

The goal is to prepare an encyclopedia that covers designated topics in a clear concise and authoritative manner. The treatment will be practical in orientation, keeping in mind the needs of the users. Theory will be included only where it is required for an understanding of the topic.

To sign up to contribute to the Encyclopedia of Water, or to find out more about the Encyclopedia, visit www.wileywater.com.

A contributor will choose one or more encyclopedia entries that he or she would like to complete from the lists of entries categorized by subject matter. If a topic you are looking for is absent, you may submit your own entry title for review.

Once you have completed the Contributor Application and have been accepted as a contributor your "Contributor Home Page" will be created which will list your assigned entries, their due dates and other important information such as contributor guidelines and instructions on submitting your completed entries.

Contributors are requested to have their completed 500 to 4000 word entries submitted six months after they initially signup to complete the entry.

Once the contributors have submitted their completed work they will be issued a \$100 gift certificate for John Wiley & Sons published books for each entry submitted.

Corporate Membership Rates for 2002

Membership Levels	Annual Package Cost	Annual per Item Cost	Annual Savings	Percent Savings
Basic Level	\$350	\$369	\$19	5%
Standard Level	\$505	\$583	\$78	15%
Industry Leader	\$735	\$886	\$151	20%
Corporate Sponsor	\$1530	\$1986	\$456	30%

Corporate Membership Features:

- Basic Level: Business Card ad in newsletter and membership directory, "Lobby Copy" of membership directory, web page sidebar, Certificate of Membership, and up to 4 employee memberships
- Standard Level: Quarter page ad in newsletter and directory, "Lobby Copy" of membership directory, web page sidebar, Certificate of Membership, and up to 9 employee memberships
- Industry Leader: Half page ad in newsletter and directory, "Lobby Copy" of membership directory, web page sidebar, Certificate of Membership, and up to 14 employee memberships
- Corporate Sponsor: Full sponsor acknowledgement in MGWA conference publications, full page ad in newsletter and directory, "Lobby Copy" of membership directory, Certificate of Membership, web page sidebar and up to 20 employee memberships

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MGWA Board Meeting Minutes

February 7, 2002

USGS WRD Office in Mounds View, MN, 7:30 am

Attending – Rob Caho, President; Jim Stark, Past President; Marty Bonnell, President-Elect; Eric Hansen, Treasurer; Jan Falteisek; Tom Clark, Newsletter Editor; Sean Hunt, WRI; Jon Pollock, Secretary.

Approval of Minutes – Rob called meeting to order at 7:30 a.m. Minutes for the Regular Board Meeting held on January 3, 2002, were amended to reflect that Marty Bonnell was not present and Jon Pollock was present. Following the change, the minutes were approved.

Treasurer's Report – Eric indicated that approximately \$20,000.00 is spent on the conferences each year with a net of \$2,000.00 to \$5,000.00. Current assets are approximately \$23,000.00. Board could transfer \$13,000.00 to Foundation. Jan

mentioned that the Board is trying to create an endowment fund to preserve capital. Motion by Eric to keep \$10,000.00 and transfer \$13,000.00 to Foundation following the outcome of the Spring Conference, second by Jim and approved by Board.

Membership – Sean stated that about 250 members have renewed their memberships. Jan mentioned that the Membership Committee meets quarterly and has not met for sometime. Historically the Secretary is the head of the Membership Committee. Rob indicated that he and Jon would work on setting up a Membership Committee Meeting.

Web Page – Sean put a Spring Conf. banner on Web Page. Still needs to update new Officers. Sean is hoping to overhaul the Web Page in the next couple of months. Mike Trojan has given Sean educational materials for Web Page. Tom mentioned that the Spring Conference sign-up form should be posted on the Web Page

— continued on next page

MGWA Minutes, cont.

as soon as enough of the details have been worked out.

Education – Mike Trojan provided Sean with materials for Web Page.

Newsletter – Tom said the next meeting will be on February 12 at 7:30 in the PCA/DNR cafeteria, and that the March issue is progressing with a draft to be sent to Sean by February 15th. A Spring Conf. registration form will be included as part of the March issue. Rob said that Bergerson-Caswell is interested in becoming a sponsor.

Old Business –

Elections: Tom would like the March Newsletter to be his last as Editor. Eric suggested that an e-mail be sent to the membership to find a new Editor. The Newsletter team will work on the text of the e-mail at their next meeting and submit it to Sean.

20th Anniversary: Eric had several catalogs with ideas for various anniversary items to give to the membership. Five dollars could be added to the Spring Conf. fee to cover the associated costs. Board approved a budget of \$3,000.00 for 20th Anniversary commemorative materials, mugs for presenters and educational give away items (pencils, pens, rulers etc.). The mugs for presenters and the educational items would not be labeled as 20th Anniversary as these items can be given out for years. Rob and Eric will work together on purchasing these items.

Awards: Jim Stark mentioned that the Awards Subcommittee recommends that Matt Walton receive the Outstanding Service Award. Rob moved to approve the subcommittee's recommendation with a second by Eric. The Board approved Matt Walton as the recipient.

MN Water Conf. 2002 (St. Cloud): Jim offered to bring a display and to man the display for some of the conf. Rob also volunteered to spend time at the display. There was some discussion of the Foundation and Education Committees also tending the display. Jan indicated that the Association may want to investigate purchasing a display.

Professional Development Hours: Sean will provide the Newsletter Team with a short message on how the MGWA will handle PDHs for their functions. Considering the lack of guidance from the licensing board and the responsibility of the licensees to determine qualified activities, MGWA will not be providing detailed information at functions on the number of PDHs etc. MGWA conference receipts state that the attendee should save them as documentation. Sean will modify future agendas to reflect that the agendas can be saved as documentation of conferences and field trip content.

New Business

Spring Conf. Rob mentioned that the planning is going very well and that John Schneiders will be the Keynote Speaker. The registration forms will indicate that hard hats will be required. This should probably be expanded to include safety glasses, hearing protection and boots. Drilling outfits will have access to the property the day before to set up. There will be five drilling sites probably performing three times during the day. The charge for vendors will be \$200.00. Eric mentioned that tents would cost approximately \$1,500.00 including delivery, set up and permits, and that chairs could be delivered and set up for \$0.99 per chair.

WRI Contract: Rob had a copy of the new WRI contract. He indicated that the cost had been increased from \$25.00 to \$30.00 dollars per hour and that it may be necessary to add costs for service related taxes. Rob made a motion to accept the contract with a

March 7, 2002

USGS WRD Office in Mounds View, MN, 7:30 am

Attending – Rob Caho, President; Jim Stark, Past President; Marty Bonnell, President-Elect; Eric Hansen, Treasurer; Tom Clark, Newsletter Editor; Sean Hunt, WRI; Jennie Leete, WRI; Jon Pollock, Secretary.

Approval of Minutes – Rob called meeting to order at 7:35 a.m. Minutes for the February 7 meeting were approved with no changes.

Treasurer's Report – Eric indicated that last year's report should go in the March newsletter if possible, if not it may be printed in June issue. Jennie arrived after this item had been discussed; however she did bring in the Profit & Loss Statement for January through December 2001.

Membership – Sean stated that about 350 members have renewed their memberships and that this figure is on target for the number of active members last year. Rob indicated that he and Jon would work on setting up a Membership Committee Meeting, but that he has been very busy with the Spring Conf. planning.

Web Page – Sean indicated that Fall Conf. info and ordering is on web page. He also noted that the education committee has several information sources on web page.

Foundation – Jim indicated concern that the Foundation Committee has been inactive. Jim will check into the status of the committee. Tom said that UWRF has submitted info on their program for the portion of the newsletter that is being used by the Foundation to show what various past and potential future organizations with recipients of Foundation grants are involved with. Rob had talked to Gordy and mentioned that he would be looking for a report on the Foundation at the Spring Conference.

Education – Rob talked to Jim Lundy and the next education committee meeting is scheduled for April 11 at 1300 at the MPCA. The committee has been working on Earth Day and the MN Water Festival.

Newsletter – A Chief Editor is needed. Tom indicated that the Chief Editor position is being rotated amongst Team members. Steve Robertson is acting as Chief for the June issue. Rob suggested that each Board member bring two names of people that could serve as Chief Editor to the next Board Meeting. Sean said an e-mail would be sent to the membership that evening in an attempt to find someone to fill the position.

— continued on next page

MGWA Minutes, cont.

Old Business –

Science Museum: The USGS is working on incorporating a gauging station at the Science Museum.

20th Anniversary: Eric said anniversary mugs will be handed out at Spring and Fall Conf. and that pens could also accompany the mugs. Eric said we also need to restock regular mugs and T-shirts.

Advertising Corporate Membership. Rob will be sending materials to potential Spring Conf. vendors.

Awards: There has been much discussion between Board Members and the Award Committee concerning the logistics of presenting and receiving the award along with the wording of the award. Jim Stark offered to pick up the recipient (Matt Walton). Jim will talk to Roman about getting Matt to the Conference. It was suggested that a note be sent to those who nominated people for this year's award letting them know that their nominees will be kept on file and considered for next year's award. It was also suggested that the Board clearly state, in writing, committee assignments and the Board's role in reviewing committee recommendations.

New Business

Spring Conf. Rob mentioned that all is going well, but that we need help with logistics. Rob is writing a Health and Safety Plan.

MN Water Conf. 2002 (St. Cloud April 17 - 20): Jim offered to bring a display and to man the display for some of the conference; however a display would need to be put together. Sean and Jennie offered to put something together. There was discussion that perhaps the Education, Foundation, and Membership Committees should be involved with these types of items. Rob, Eric, and Marty offered the use of their company's display boards. Jennie suggested that the MGWA purchase a display. Eric offered to purchase a display. There was a motion by Jim to allow Eric to purchase a display with MGWA funds (up to \$600.00). Second by Jon, and approval by the Board.

Fall Field Trip. Field trip is put on by AIPG and MGWA. This year, MGWA will be the lead organization. Marty will contact AIPG to see if their contact will be able to attend the next MGWA Board Meeting.

Future Meeting Location. Board can continue to meet at USGS; however, members should sign in upon entering. Anyone interested in moving the location of future meetings should suggest other locations.

April 4, 2002

USGS WRD Office in Mounds View, MN, 7:30 am

Attending – Rob Caho, President; Jim Stark, Past President; Marty Bonnell, President-Elect; Tom Clark, Newsletter Editor; Sean Hunt, WRI; Jennie Leete, WRI; Jon Pollock, Secretary; Norm Mofjeld; Future Newsletter Editor

Approval of Minutes – Rob called meeting to order at 7:35 a.m. Minutes for the Regular Board Meeting held on March 7, 2002, were approved.

Treasurer's Report – Jennie reported that most membership dues are in and the estimates for the Spring Conference income and expenses look good. Jennie passed out a January-December 2002 Profit Loss Statement and the Spring Conference income and expenses.

Membership – Sean passed out membership totals and estimated approximately 400-550 members for the year.

Web Page – Sean is looking into another provider for a lower cost.

Foundation – Gordy is working on setting up a meeting. Gordy will present a short report on the Foundation at the Spring Conf.

Education – Sean indicated that the Education Committee will be meeting on 4/11/02. Mike Trojan requested that Sean attend the meeting to continue work on the Web Page.

Newsletter – Norm Mofjeld will be the next Newsletter Editor. Tom will introduce Norm at the Spring Conf. Sean indicated that the Newsletter is produced in (pdf) electronic format. Members could receive an email telling them the Newsletter is available with a link to the web site for them to

download it if they desire. Sean mentioned that the MGWA Members that work at the MPCA did not receive their newsletters. Tom will work with Sean to make sure they get copies of the Newsletter.

Old Business –

Newsletter Editor: Norm Mofjeld will be the Newsletter Editor. Tom Clark will introduce him at the Spring Conf.

20th Anniversary: Jennie suggested Oakshore Park in Hugo Township for the Summer Picnic. Date is August 3, 2002.

Advertising Corporate Membership. Starting to solicit more advertising. A mailing will go out this week or next and calls should be made to follow-up on the mailing, as mailing alone has not been productive in other endeavors. Jennie indicated that she thought Jim Aiken would be making the calls. It was also noted that the current corporate members need to be renewed. Rob will have Jim Aiken call the current corporate members.

Awards: Sean has text from Leigh Harrod and the logo. He will coordinate with Hammond to have the award made. Jim will be following up on how Matt will get to the Conference. After the Conference a letter should be sent to the committee thanking them for their service and telling them that their names will be considered for next year's Award Committee. The Board will discuss this item after the Conference.

New Business –

Spring Conf. Over 100 people are registered. Rob mentioned that all is going well, but that help is needed the day before and the day of the Conference for set up and parking. Jim and Jon will help out with parking. Jon will also help out the day before. Rob is writing a Health and Safety Plan. Drillers will be handling their own permits.

MN Water Conf. 2002 (St. Cloud April 17 - 20): Jim offered to bring a display and to the conference. A display has been ordered. Sean and Jennie will put a display together.

Fall Field Trip. Marty is working on this and Jennie has contacted DNR's

— continued on next page

MGWA Minutes, cont.

SE MN Karst Hydrologist Jeff Green about suggestions.

Future Meeting Location. Board can continue to meet at USGS; members should sign in upon entering.

Meeting was adjourned at 0915.

May 2, 2002

USGS WRD Office in Mounds View, MN, 7:30 am

Attending – Rob Caho, President; Jim Stark, Past President; Marty Bonnell, President-Elect; Eric Hanson, Treasurer; Norm Mofjeld, Newsletter Editor; Sean Hunt, WRI; Jennie Leete, WRI; Jon Pollock, Secretary; Mark Ferrey, Education Committee

Approval of Minutes – Rob called meeting to order at 7:35 a.m. Minutes for the Regular Board Meeting held on March 7, 2002, were approved as amended.

Treasurer's Report – Net approximately \$6,400.00– from Spring Conference; however, some additional expenses still coming in. Jennie handed out Spring Conference financial sheet, Balance Sheet as of May 2, 2002, and the Profit and Loss Statement from January 1 through May 2, 2002. The Board approved a transfer \$13,000.00 to Foundation for endowment.

Membership – Sean passed out membership total (496). Discussion of the history of the Membership Committee. Committee has not met regularly for several years. Committee members include Rob, Eric, Sean, Jon and Jim Aiken. Jon will schedule a Membership meeting.

Web Page – Sean is looking into another provider for a lower cost. Tom Alvarez at MDH would like to have link from their web page to the MGWA web page. Sean will follow up.

Foundation – Transfer of \$13,000.00 to Foundation for endowment approved by Board (see Treasurer's Report above).

Education

– Mark Ferrey e-mailed information to Board members on May 1, 2002, concerning MGWA providing comment to pending legislation. Mark indicated that this idea came out of the MGWA Fall Conference and that no current legislation was acting as a driving force for the initiative. There was discussion on how the MGWA could provide input and how other organizations provide input. Board asks Education Committee to look into the process other organizations use to provide official comment on public issues.

– Education Committee members have been giving presentations at schools and Mike Trojan has been working with Sean on the web page. Rob mentioned that the MGWA now has purchased a display board.

Newsletter

– Norm reported that a Newsletter subcommittee has been formed to make the transition from paper to electronic format. The June issue is progressing on schedule and Norm will add Education Committee's idea to provide public policy input to June issue.

– Jennie estimated the cost to transfer all back issues of the newsletter to a searchable electronic format would be approximately \$2,800.00 and that CD's could be sold for \$20.00 to \$25.00. March was the first issue to be completely electronic. The Board suggested that the Newsletter Team be informed of the cost of the transfer and should evaluate whether they think this should be done.

Old Business

20th Anniversary: Approximately 300 pens and 400 anniversary mugs left from the Spring Conference. No shirts ordered yet, but will be for sale at picnic.

Advertising Corporate Membership.

Two more corporate members – LBG and Liesch. Renner will be advertising in

business card size ad.

Spring Conference: Jennie will send Rob stationary for thank you letters.

– Sean passed out comments on Spring Conference. It appears that approximately 20 people filled out evaluation form and comments were favorable.

– Awards: Matt Walton was unable to attend conference. Picture of Plaque for Newsletter:



New Business –

Fall Field Trip: Rochester – Jeff Green of DNR Waters suggested several field trip stops.

Fall Conference: Small municipalities and water supply.

Summer Picnic: August 3rd

Next Meeting – The next Board Meeting will be June 6, 2002, 7:30 a.m. at the USGS office in Mounds View. Meeting was adjourned.

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Join the Minnesota Ground Water Association!

If you are reading this newsletter second-hand, we'd like to take this opportunity to invite you to become a member of MGWA for 2002. Annual dues are \$25 for professional members and \$15 for students. Members are entitled to purchase a paper copy of the annual membership directory for \$7; an electronic version will be available on the website for paid members. Additional donations to the MGWA Foundation will be gratefully accepted. Membership rates valid until August 1, 2002. After that date, please check the MGWA web site for current information.

*Dues paid to MGWA are **not** deductible as charitable contributions for federal income tax purposes. However, dues payments are deductible as ordinary and necessary business expenses to the extent allowed by law. The MGWA Foundation is a 501(c)3 non-profit and donations paid to MGWAF **are** deductible as charitable contributions.*

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Hog Roast August 3rd!

MGWA will celebrate its 20th birthday with a hog roast in the tradition of Bruce Bloomgren's famous gatherings. The location will be Oakshore Park in Hugo (meet at 4779 126th St North). Look for a more detailed invitation later this summer.

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