

Minnesota Ground Water Association

www.mgwa.org

Newsletter

September 2016
Volume 35, Number 3

Featured:

- ◆ Salary Survey, page 1
- ◆ White Paper Update, page 3
- ◆ Minnesota Hydrogeology Atlases, page 4
- ◆ Geologic Atlas of Blue Earth County, Part B, page 12



MGWA President
Ole Olmanson

Inside:

President's Letter	1
MGWA Social Hour	2
Member News	2
MGWA News	3
Abbreviations and Acronyms	4
Agency News	10
Student Section	11
Featured Photo	11
MGWA/MGWAF Minutes	18

President's Letter

It's fall in Minnesota and many long-time residents would agree, it is quite possibly the best season to live here. There are plenty of warm days left, but the humidity and mosquitos of summer are gone for the year. The only folks that could disagree are those young enough to be heading back to school. The loss of summer freedoms seem to heavily outweigh benefits of a proper education in their minds.

On the topic of education, the MGWA's White Paper Committee has been working hard over the last year to study the role of groundwater in our education systems. Their work is highly appreciated; I know that they have quite thoroughly examined the topic and have authored a comprehensive report to give the rest of us plenty to think about. MGWA members can expect an in-depth review at the fall conference.

At the time of writing this letter, we are final-

izing the program for the fall conference and here are the details I have to share. The conference will be held on November 16. The title this time is "Modern Advances in Minnesota Ground Water". We will use the day to highlight the newest science, policy and information available to us. You can expect a great day of presentations and networking with your industry peers. There will definitely be something for everyone.

As I mentioned in a previous letter, our spring conference attendance had very good student representation. We hope to see that continue this fall. We encourage anyone who may have students with projects to contact us about presenting a poster of their work. This type of activity helps to build strong relationships between the current and future groundwater professionals.

— continued on page 4

Taking the Pulse of the Membership:

Results of the Second MGWA Salary Survey – Part One

by Kelton Barr

This spring the MGWA initiated its second salary survey, five years after its first survey. In all, 208 of the 507 members participated, or 41 percent. Perhaps because the survey had an expanded scope, including questions for the membership from the current White Paper work group, 127 respondents submitted salary information, or 25% of the membership. While this is double the rate of response for other organizations' salary surveys, it is less than half of the response for our first survey. If you participated with your salary info, we thank you!

The tabulated results will be reported in this and the next newsletters. This article will describe the educational levels and types of employment of our membership and the effects of these on levels of compensation as determined from the survey results.

Educational Levels

The 208 respondents reported 2 associate's degrees, 282 bachelor's degrees, 159 master's degrees, and 19 doctoral degrees, for a total of

462 degrees. Quite obviously, our respondents have multiple degrees, with a number of them reporting multiple bachelor's degrees and master's degrees. A well-educated group!

Of the respondents with salary information, 50 (39.4%) reported having a bachelor's degree, 70 (55.1%) reported having a master's degree, and 7 (5.5%) reported having a doctoral degree as their highest diploma. For the remainder of this article those reporting salary information

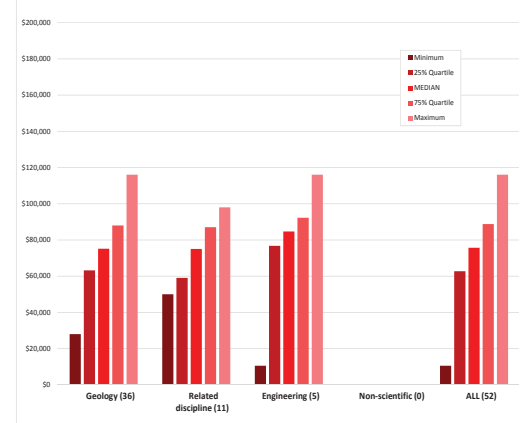


Figure 1. Annual salary – Bachelor's degrees

— continued on page 6

MEMBER NEWS

MGWA Newsletter Team

Editor-in-Chief

Tedd Ronning

Xcel Energy

tedd.a.ronning@xcelenergy.com

Sherry Kroening

Minnesota Pollution Control Agency

sharon.kroening@state.mn.us

Joy Loughry

current issue editor

Minnesota DNR

joy.loughry@state.mn.us

Andrew Streitz

Minnesota Pollution Control Agency

andrew.streitz@state.mn.us

Eric Tollefsrud

Geosyntec Consultants

ETollefsrud@geosyntec.com

Ruth MacDonald

Minnesota DNR

ruth.macdonald@state.mn.us

Advertising Manager

Jim Aiken

Barr Engineering Co.

(952)832-2740

jaiken@barr.com

MGWA Management

WRI Association Mgmt Co.

(651)705-6464

office@mgwa.org

MGWA Web Page

Visit www.mgwa.org for MGWA information between newsletters and to conduct membership and conference transactions.

Newsletter Deadlines

Issue	Due to Editor
December '16	11/04/2016
March '17	02/03/2017
June '17	05/05/2017
September '17	08/04/2017

© Minnesota Ground Water Association. ISSN: 1098-0504

Material in this publication may be reprinted if appropriate credit is given. Views expressed in this publication do not reflect official MGWA policy unless expressly stated as such.

A Minnesota couple working to improve water quality

Do you know who Pat and Bob Tammen are? How about a hint? They are both retired MGWA members, live in Soudan, and are regulars at MGWA meetings. And they are VERY concerned with the quality of water in Minnesota. If you need a refresher on who this dynamic couple is, and want to learn more about their full time effort to protect this important resource, check out the link below. And say hi when you see them at the fall conference!

<https://www.youtube.com/watch?v=Own0bsHQCn4>



Tim Cowdery Recognized as Civil Servant of the Year

Tim Cowdery, MGWA member and USGS hydrogeologist for the Minnesota Water-Science Center, received the 2016 USGS Civil Servant of the Year Award from the Federal Executive Board of Minnesota. Every year, the Board recognizes federal employees who have shown outstanding performance.

Tim was nominated for this award because he maintains high standards of scientific rigor and professionalism in every aspect of his work. Tim was instrumental in building a program that investigated the hydrology and water quality of the Glacial Ridge National Wildlife Refuge and has built strong collaborative relationships with the US Fish and Wildlife Service, the Nature Conservancy, numerous state agencies, and Native American tribes in Minnesota.

In 2015, Tim developed and implemented a robust database process critical to the mission of the USGS. Tim strives to find more efficient ways to manage the USGS groundwater data program. Tim also is a mentor for student and early-career employees. Tim volunteers his time and talents with the Girl Scouts and has served as president of the board of the Lyndale Neighborhood Association in Minneapolis.

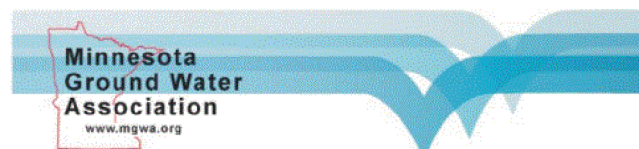


MGWA SOCIAL HOUR TUESDAY, OCT. 18

Minnesota Ground Water Association Happy Hour

An opportunity for students to socialize with professionals in the groundwater, hydrogeology and geology industry, and to learn more about the Minnesota Ground Water Association.

Appetizers provided by MGWA. Individuals must purchase their own drinks. Look for tables designated with MGWA signs. Street parking available along Como Ave and nearby streets.



Tuesday, October 18
4:30 – 6:30pm

@

Sporty's Pub & Grill
2124 Como Ave SE,
Minneapolis, MN 55414

Free appetizers!

**Network with
professionals!**

MGWA's Corporate Members

Braun Intertec

Rochester Public Utilities

Respec

Barr Engineering

NTS

Links at www.mgwa.org

Abbreviations and Acronyms

- ◆ ASTM – American Society for Testing and Materials
- ◆ DNR – Minnesota Department of Natural Resources
- ◆ MDA – Minnesota Department of Agriculture
- ◆ MDH – Minnesota Department of Health
- ◆ MGS – Minnesota Geological Survey
- ◆ MPCA – Minnesota Pollution Control Agency
- ◆ USEPA or EPA – United States Environmental Protection Agency
- ◆ USGS – United States Geological Survey

President's Letter, cont.

Here is the MGWA Fall Conference outline as it stands as the newsletter goes to press:

Modern Advances in Groundwater

In this current age of information and technology, our understanding of the world is changing at a rapid pace, this includes all aspects of the groundwater field as well. Data is easier to acquire, process, and share. New techniques can be applied to old problems, information can be shared instantly across the globe, and water can now be measured by satellites orbiting our planet.

The MGWA Fall Conference will highlight a broad range of new and interesting advances in groundwater. It will include updates on local groundwater issues, new mapping efforts, advancements in data collection, new understanding of emerging contaminants, and a discussion of how groundwater science has entered the space age.

Who Should Attend?

This conference will be of interest to consultants, scientists, students, regulatory agencies, elected officials, and other professionals in groundwater related industries. The selected speakers will cover a wide range of topics with the intention of providing relevant content across the groundwater spectrum. MGWA conferences are designed to foster an environ-

ment of education and collaboration for all individuals associated with the groundwater community.

Invited Speakers:

- ◆ John Bolton - NASA, Seeing Water From Space
- ◆ Virginia Yingling - MDH, Understanding PFOS and PFOA
- ◆ Greg Brick - DNR, MN Spring Mapping
- ◆ Mindy Erickson - USGS, Surface Water-Groundwater Interaction at White Bear Lake
- ◆ Crystal Ng, U of MN, Lessons Learned from the Bemidji Oil Spill
- ◆ MGWA White Paper Committee, Minnesota's Groundwater Education Gap
- ◆ John Dustman, Summit Envirosolutions, Groundwater Analytics for the Future of Aquifer Resource Management

Please check our website for the most up to date information on the conference program and registration. I know that these meetings have filled to capacity in the last few years, so don't wait too long to sign up.

Have a great fall season, and I'll see you at the conference.

Minnesota Hydrogeology Atlases Completed

By Roberta Adams

The second and third installments of the Minnesota Hydrogeology Atlas (MHA) series were completed in spring 2016 by the DNR County Geologic Atlas Program and are now available for the public.

- ◆ The Pollution Sensitivity of Near-Surface Materials, HG-02
- ◆ Water-Table Elevation and Depth to Water Table, HG-03

The atlases include a report, map plates, and GIS data. The coverage is continuous statewide but can be used by a specific area defined by the user. The first installment, Pollution Sensitivity of Bedrock Surface HG-01, was released in the fall 2015.

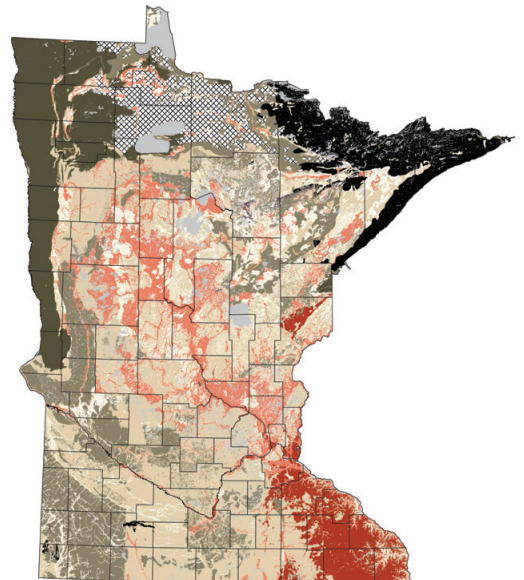
The Minnesota Hydrogeology Atlas series is a statewide format for groundwater information, building on maps and data initially published

— *Figure 1. Pollution sensitivity of near-surface materials in Minnesota. This map depicts the statewide pollution sensitivity of the near-surface materials for Minnesota. Generally, areas of coarse-grained material are modeled as higher sensitivity to pollution compared to areas of fine-grained material. Exceptions exist where special conditions occur.*

for the County Geologic Atlas series.

The MHA provides general data for evaluating the impact of potential pollutant sources on groundwater and are components of surface-water infiltration planning. However, additional site-specific information is required to make accurate determinations on a smaller scale. Information and downloads are available on the website.

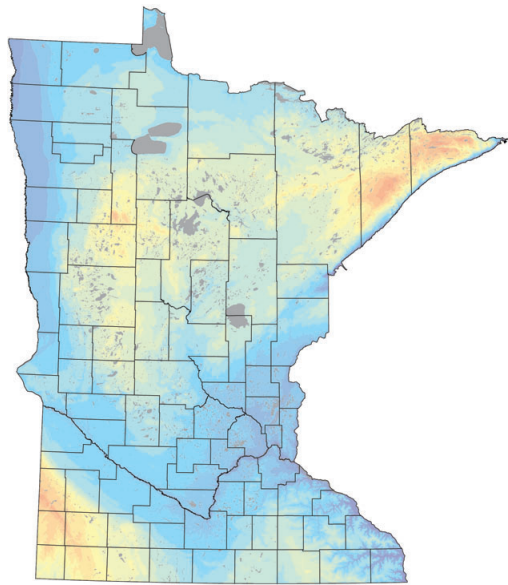
— *continued on page 5*



Minnesota Hydrogeology Atlases, cont.

Minnesota Hydrogeology Atlas:

http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status_mha.html



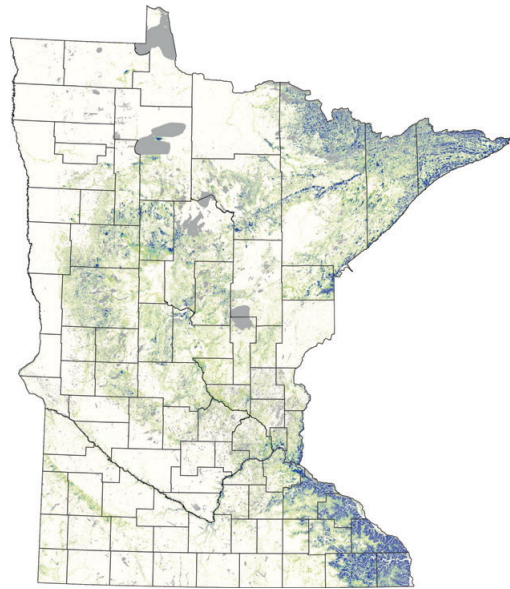
— Figure 2. Water-Table Elevation in Minnesota

This map depicts the statewide water-table elevation for Minnesota. The water table is typically within 10–30 feet of the land surface and generally mimics the surface topography: deeper in the uplands and shallower in the valleys. In upland bluff areas near deeply incised river valleys, the water table can be more than 120 feet below land surface.

For More Information

For related atlases, search the DNR website for County Geologic Atlas Program, Maps and Studies:

http://www.dnr.state.mn.us/waters/groundwater_section/mapping/atlas.html



— Figure 3. Depth to Water Table in Minnesota

This map depicts the statewide depth to water table for Minnesota. Depth data were derived by subtracting water-table elevation from the land surface topography using the statewide 30-meter digital elevation model (DEM) derived Light Detection and Ranging (LiDAR) data.

HG-02 Pollution Sensitivity of Near-Surface Materials

The sensitivity to pollution of near-surface materials is an estimate of the time it takes for water to infiltrate the land surface to a depth of 10 feet. It is intended to estimate the time of travel through the unsaturated zone to reach the water table, which is assumed to be 10 feet below land surface everywhere for the purposes of this method.

Sensitivity varies across Minnesota. Generally, areas of coarse-grained material are modeled as higher sensitivity to pollution compared to areas of fine-grained material. Sensitivity is based on a two layer model, using the hydraulic conductivity of soils and surficial geology unit textures. Exceptions to the two layer model exist where special conditions occur, such as karst and bedrock at or near surface.

HG-03 Water-Table Elevation and Depth to Water Table

The water table is defined as the surface below which sediment is saturated with groundwater. It occurs in both aquifer and non-aquifer sediment across the entire state. In general, the water table is within 10 feet of the land surface and follows the surface topography. However, the water table can be more than 120 feet below land surface near deeply incised river valleys such as the St. Croix, Minnesota, and Mississippi river valleys. In this report, the water-table elevation represents the elevation of the water table relative to sea level, and the depth to water table represents the distance from the surface to the water table.



LABORATORIES, Inc.

P.O. Box 249
NEW ULM, MN 56073-0249

**Independent laboratory services, specializing in
testing of groundwater, soil, hazardous wastes,
sludges and drinking water.**

On site sampling services available

Call: (800-782-3557)

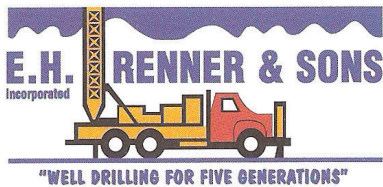
Salary Survey, cont.

will be called “respondents.”

Figures 1, 2, and 3 summarize the salary distributions for those respondents whose highest degree(s) is one or more bachelor’s, master’s, and doctorate degrees, respectively, which have been further differentiated by type of degree, *i.e.* geology, engineering, a related scientific discipline, or non-scientific discipline. Not too surprisingly, the more respondents a degree group had, the greater is the range of salaries, indicating that individual employment situations ultimately determine salary levels. Also unsurprisingly, these figures show a general increase in salary with successively higher degrees with the median base income for bachelors, masters, and doctorate degree holders of \$75,700,

ROGER E. RENNER
President

(763) 427-6100
Mobile:(763) 286-9355
Fax: (763) 427-0533



NGWA Certified Master Ground Water Contractor

15688 Jarvis St. NW
Elk River, MN 55330

rener@ehrenner.com
www.ehrenner.com

THEIR WELL

Over 120 Years of Service



- Geo Probing
- Soil Borings
- Monitoring Well
- Remediation Wells
- Angle Drilling
- Rock Coring
- Well Televising
- Gamma/E-logging
- Test/Production Wells
- Pump Sales/Service
- Well Rehabilitation
- Well Abandonment

**Certified Master
Groundwater Contractor**



1-800-450-8000

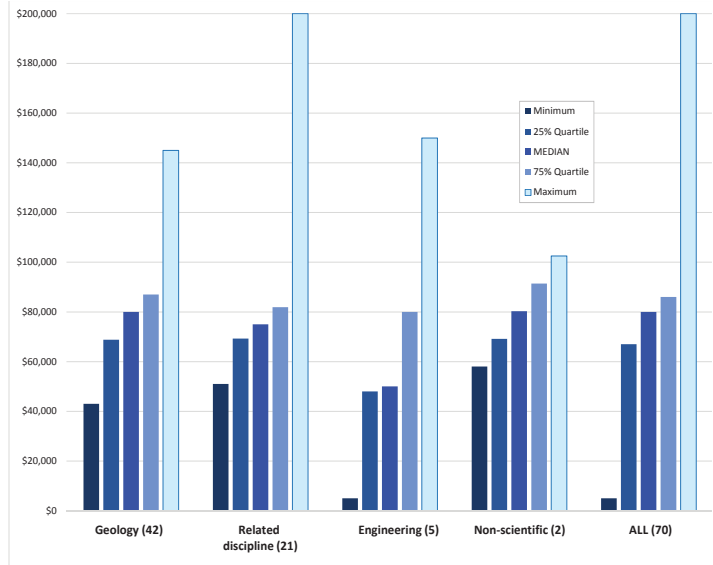


Figure 2. Annual salary – Master's degrees

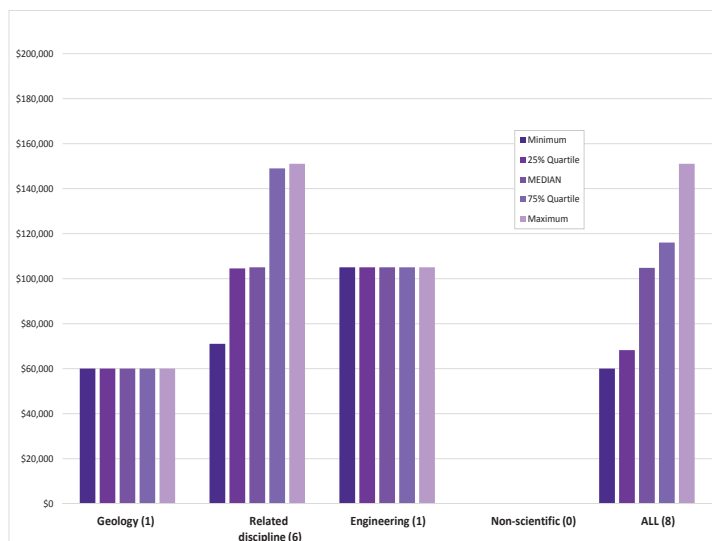


Figure 2. Annual salary – PhD degrees

\$80,000, and \$104,800, respectively. For each degree, engineering degrees tended to receive higher pay than geology or related degrees, but half of the bachelor’s and master’s degree holders generally earned in the mid-\$60K to mid-\$80K range with half of PhD holders earning in the \$70K to mid-\$110K range.

Types of Employment of our Membership

Respondents were given 14 types of employment to describe their current and past places of employment as a groundwater professional. Nine of these employer groups (education, research, federal, state, county, city, regional, non-profit, and other public) will be collectively referred to as Public Sector groups. 74 respondents (59.2%) are currently employed in these groups. Five other groups (consulting, laboratory/testing, mining/construction, drilling, and other private) will be collectively referred to as Private Sector groups. 51 respondents (40.8%) are currently employed in these groups. In addition, one member reported as unemployed, 3 reported as part-time or semi-retired, and 10

— continued on page 7

Salary Survey, cont.

reported as retired; too few of these members reported financial information to discuss further here.

Results

Figure 4 shows the distribution of the respondents among the employer groups. As can be seen, the largest groups are State (50) and Consulting (41). All of the other groups are composed of less than a dozen respondents with 24 in the other Public Sector groups and 10 in the other Private Sector groups.

Figure 5 summarizes the range of professional experience of the respondents in each employer group. While reported by current employer group, the total professional experience of each respondent is reflected in this figure. Furthermore, this figure includes the experience information for those survey participants that did not report financial information so as to more fully reflect the experience distribution within each employer group.

All but three groups have medians of less than ten years of professional experience. Of the three groups with higher medians, Drilling respondents reported a median of less than 15 years, Research respondents reported a median of 40 years, and Education respondents reported a median of 45 years. This may suggest that these last two employer groups may be experiencing higher rates of retirement in the near future. Of note, all of the employer

groups had median levels of experience of 7.5 years or less with the exceptions of Education, Research, and Drilling which had median years of experience of 45, 40, and 12.5, respectively.

Figure 6 summarizes the statistics by employer group for salary (base salary, bonus, and overtime) of the respondents. For the employer groups with 5 or more respondents, median Public Sector salaries ranged from \$70,000 to \$90,000, and the median Private Sector salaries ranged from \$95,000 to \$105,000.

Figure 7 summarizes the statistics by employer group for employer-provided benefits (retirement, insurance, etc.) of the respondents. Again looking at the employer groups with 5 or more respondents, median Public Sector benefits ranged from \$14,000 to \$24,000, and median Private Sector benefits for the Consulting group was \$11,000; the other Private Sector employee groups had less than 5 respondents.

Figure 8 summarizes the statistics by employ-

— continued on page 8

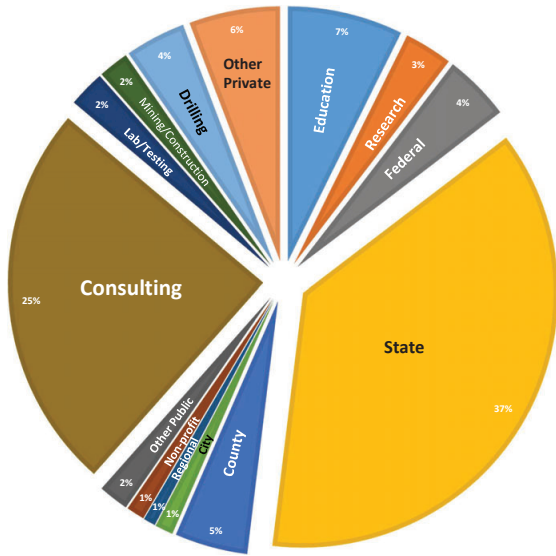


Figure 4. Employment of MGWA survey respondents

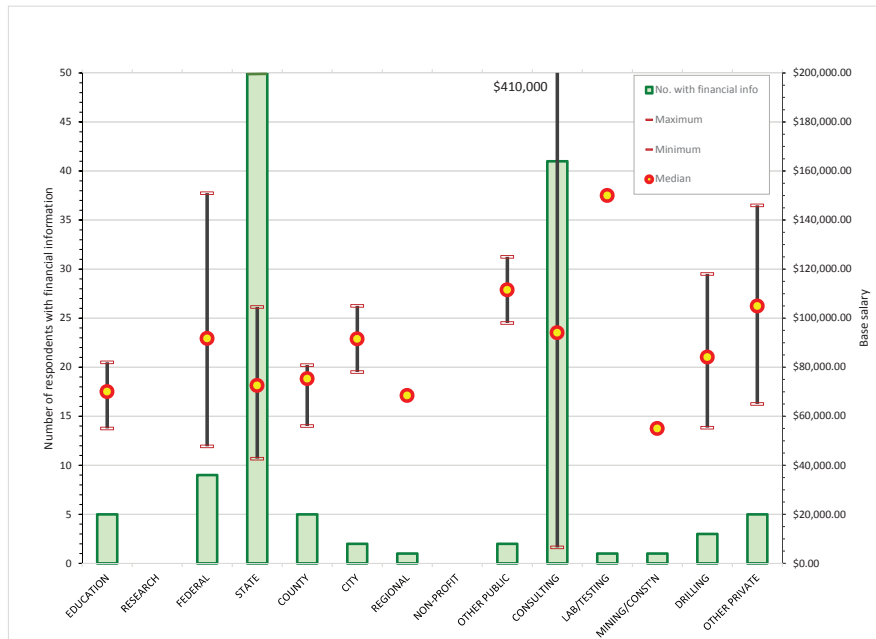


Figure 5. Members' total professional experience, by employer groups

DOWNHOLE WELL SERVICES, LLC.

- Radial View Color Video Inspection (4 in. min.) • Axial View Color Video Inspection (2 in. min.) • Natural Gamma Logging • Electric Logging (R & SP) • Caliper Logging
- Temperature Logging • Impeller Flow Logging • Normal Resistivity Logging
- Spectral Gamma Logging

Jim Traen, Manager / Geophysical Technician
 8145 Long Lake Road, Mounds View, Minnesota 55112-6033
 Ph. (651) 238-1198 • Off. (763) 785-1876 • Mob. (612) 708-7824
 Fax (763) 784-2244 • Email: Jim@DownholeWellServices.com
 Web Site: DownholeWellServices.com

Environmental Site Assessments
Mining Environmental Permit Compliance
Soil & Groundwater Remediation
Wetlands Delineation/Mitigation
Dewatering System Design & Operation
Geotechnical Engineering
Construction Materials Testing

Environmental Science & Engineering

www.netechnical.com 218-741-4290

Salary Survey, cont.

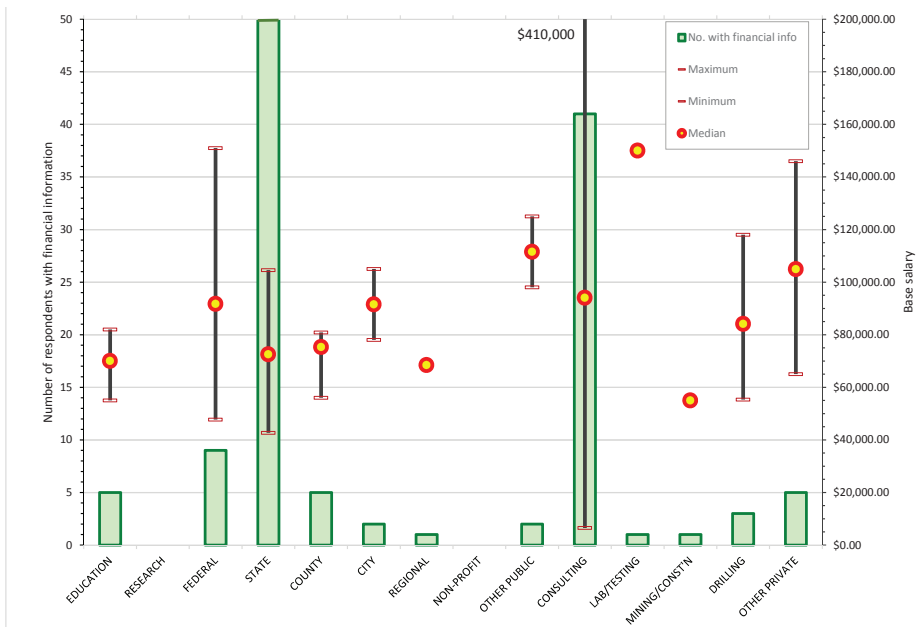


Figure 6. Respondents' annual salaries, by employer groups

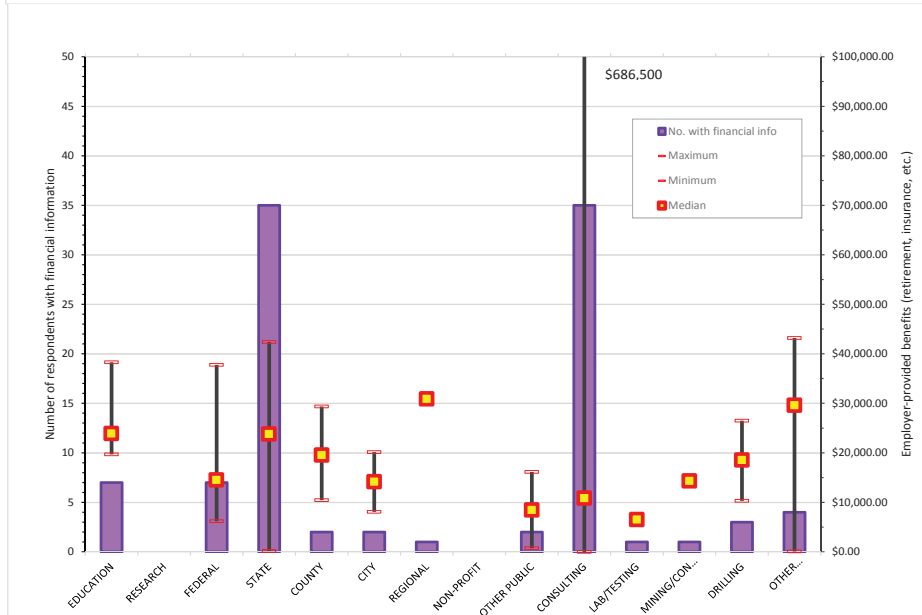


Figure 7. Respondents' annual benefits, by employer groups

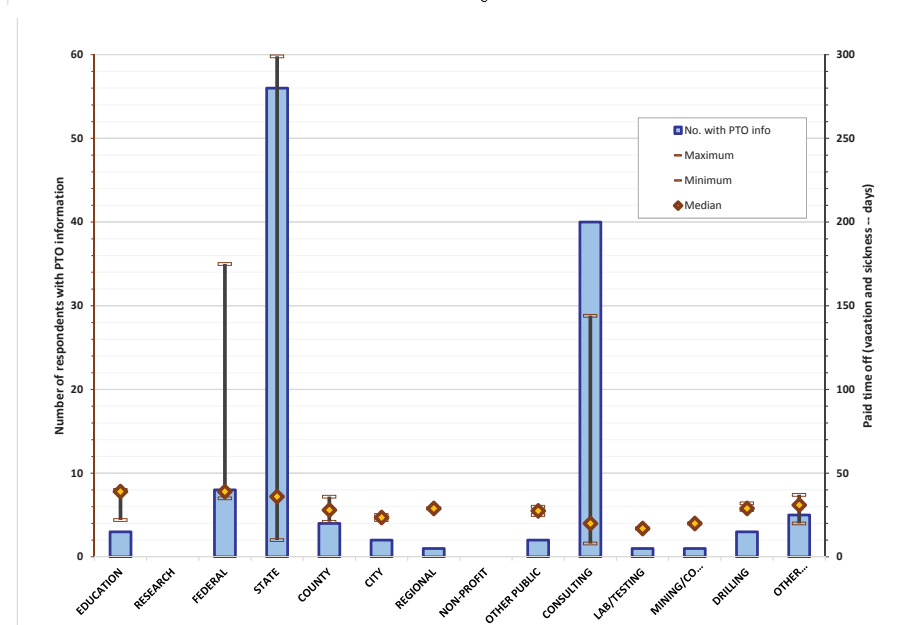


Figure 8. Respondents' paid time off, by employer groups

— continued on page 9

Salary Survey, cont.

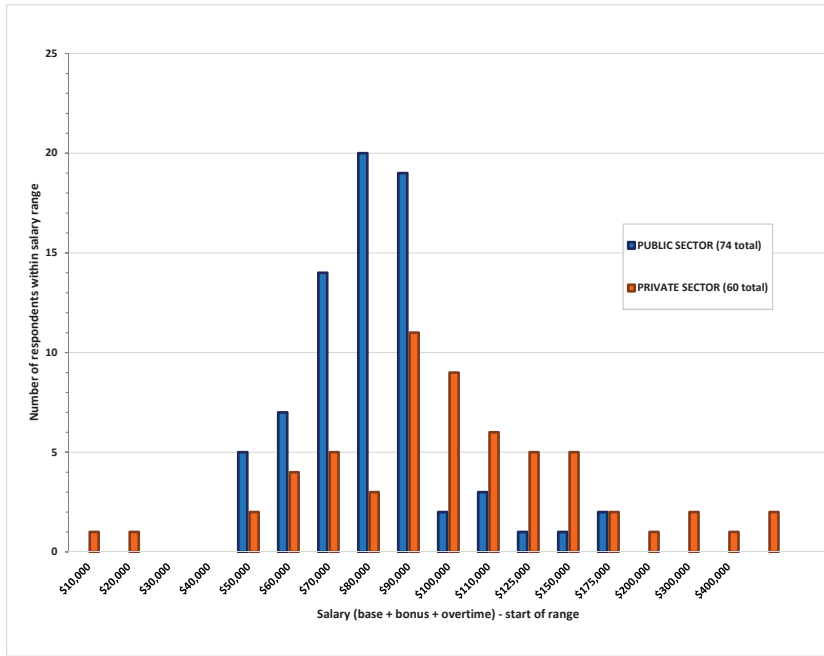


Figure 9. Annual salary – public sector vs. private sector

er group for paid time off (vacation and sickness days) of the respondents. Again looking at the employer groups with 5 or more respondents, median Public Sector PTO ranged from 36 to 39 days, and median Private Sector PTO ranged from 20 to 31 days.

Public vs. Private Sectors

Figure 9 compares the salary (base + bonus + overtime) of the Public and Private Sector employer groups taken together. As can be seen, the Public Sector salaries cluster more tightly, ranging from the \$40,000-\$50,000 bracket to the \$150,000-\$175,000 bracket and has a median salary in the \$70,000-\$80,000 bracket. In contrast, the Private Sector salaries have a much wider spread, ranging from the \$0-\$1000 bracket to the \$400,000-plus bracket and has a median salary in the \$90,000-\$100,000 bracket.

Taking the salary, benefits, and PTO together, it appears that the Private Sector employer groups generally have somewhat higher salaries, but the generally greater benefits and PTO of the Public Sector groups make the total compensation of the Public and Private Sectors to generally be equivalent.

These results are meant to provide a context for the types of compensation for individual professionals and for groups of professionals. We hope that this information can be useful for overcoming anecdotal comparisons of the different types of educational levels, lengths of employment, and places of employment.

NEXT ISSUE: Further demographics of the membership and compensation by gender and age.

BARR

opportunities
in changing times

We're proud to support MGWA and to have been named the nation's top environmental services firm to work for.*

*Environmental Business Journal and CE News

Barr's wide client-sector base and simple dedication to service have allowed us to thrive and grow for more than 40 years. If you are looking for a new opportunity and a fresh take on what consulting can be, please contact us or visit our website.

We work on some of North America's most challenging Brownfields, water management, mining, and energy projects. To meet the growing demand from our clients, we are adding the following professionals:

- hydrogeologists
- geologists and geochemists
- environmental engineers
- Phase I specialist
- environmental data technician

resourceful. naturally.

800.632.2277 Barr Engineering Co. www.barr.com/careers
Minnesota Michigan Missouri North Dakota Alberta

Mark Brigham Selected as the USGS Minnesota Science Center's Investigations Section Chief

Reprinted from USGS Minnesota Water Science Center Newsletter

Mark has been selected as the Minnesota Water Science Center's Investigations Section Chief. In that capacity, he will manage the Minnesota Water Science Center's hydrologic studies. Mark has worked at the USGS in Minnesota his entire professional career, starting in 1991 when he was hired out of graduate school to work on the National Water Quality Assessment (NAWQA) Program's study of water quality in the Red River of the North Basin. This 5-year study examined pesticides, nutrients, and other contaminants in groundwater and surface water, as well as hydrophobic organic and trace-metal contaminants in fish and stream sediments. After working on several studies in Minnesota, he spent 12 years as the team lead for the NAWQA Program's Mercury in Stream Ecosystems team. This team produced more

than 50 papers and reports (<http://water.usgs.gov/nawqa/mercury/pubs/>).

Most recently, Mark served as team lead for the MN WSC's Biogeochemistry team and managed a study on contaminants of emerging concern in tributaries to the Great Lakes. Outside of work, Mark enjoys canoeing, hiking, and cycling in the great outdoors. He has also coached youth hockey and fastpitch softball, and volunteered at two environmental education non-profit organizations. Mark's full professional profile is at: <http://profile.usgs.gov/mbrigham>



Groundwater Restoration and Protection Strategies

Managing Resources at the Watershed Level

By Carrie Raber, Minnesota Department of Health

In partnership with other state agencies, the Minnesota Department of Health is initiating the Groundwater Restoration and Protection Strategies (GRAPS), a process to provide groundwater and drinking water information and management strategies on a watershed scale for incorporation into local water management plans. GRAPS fits into the Watershed Approach for resource planning in Minnesota.

Why GRAPS

The impetus of GRAPS stemmed from two specific needs. First, the desire for better inclusion of groundwater and drinking water information in state level planning. And second, a grassroots initiative requesting incorporation of groundwater data into local planning efforts to create implementation and engagement activities. From these interests GRAPS was born.

Elements of GRAPS

Building the foundation: Characterization of the physical setting at the watershed scale.

An understanding of the surface water, groundwater, climatic, and land use issues is a necessary prerequisite to creating a context for review and assessment of data. The Minnesota Pollution Control Agency currently creates Groundwater Reports, organized around the hydrologic cycle, for their Watershed Restoration and Protection Strategies (WRAPS) work. The goal is for these stand-alone reports to set the stage for GRAPS efforts as well, eliminating the need for carrying out a separate and redundant effort.

Groundwater data and information compilation and review: What do we know?

State data and information about groundwater is scattered across multiple state agencies, and is often organized at the program level. This diversity and spread of data sources is confusing to local implementers and a process needs to be established to as-

semble and deliver this data, organized by watershed where possible. Additionally, this data need to be delivered in a manner that makes it understandable to local implementers, as well as local officials. For example, data about nitrate levels in drinking water wells presented as raw numbers, may not drive action without understanding that water quality standards are 10 mg/L for nitrate in drinking water. At a minimum, GRAPS is delivering data snapshots at the time the report is prepared. However, GRAPS is evaluating ways to develop methodologies to deliver data in real time so that it is available to local decision makers at the time of implementation.

Assessment: Identification of problems, issues and opportunities

This step involves assessing the available data and information relative to appropriate and relevant standards and priorities. Such efforts are intended to conclude in the identification of issues relative to groundwater quality or quantity. For instance, a review of private well water quality data and township-scale nitrate testing may identify large areas in which groundwater resources exhibit nitrate concentrations above the standard. This issue will be identified, aggregated and organized at the major and minor watershed scale to assist local implementers in their work.

Action plan: Goals, objectives, measures

Provide details on water quality and quantity issues and identify what needs to be done to clean up groundwater that is impaired and to protect areas that are at risk of becoming impaired, as well as protect aquifer levels to maintain sustainability goals and support healthy ecosystems.

Meeting local needs: outreach, capacity development, resource availability

One of the key pieces of any process to package and deliver information is to prepare the recipients to understand and make effective use of the information. MDH commissioned the Freshwater Society to conduct a needs assessment study to identify the barriers and obstacles faced by local implementers in executing implementation activities to benefit groundwater resources. Groundwater training and tools are being developed, in addition to the GRAPS report, to address the needs at the local level.

— continued on page 11

Internship and Interest in Geology and Hydrogeology

By MacKenzie Murphy; 2016 MGWA Scholarship Recipient

As an intern at Cedar Corporation, an environmental consulting company, I have applied many of the techniques and skills relating to hydrogeology and environmental remediation that I learned in school. During my first internship last summer, I was involved in numerous projects from well installations, monitoring well sampling, and gas tank removals, all requiring soil and water sampling. I sampled and reviewed results from water testing to further comprehend the importance of proper technique and to understand how a substance may be transported underground.

This summer, Cedar Corporation was subcontracted to work at the Ashland Superfund site, along Lake Superior and Chequamegon Bay. The Superfund site in Ashland, Wisconsin is currently undergoing a wet dredge (June 2016) as part of the Phase II environmental remediation. Cedar Corporation was contracted for air monitoring, but on this large operation, soil and water samples also are collected periodically for the purpose of observing the progress of the project.

Along the site perimeter, air monitoring stations are positioned to intercept air to test if any on-site activities will affect the public. Soil and water samples are collected from monitoring wells, some reaching to the Copper Falls Aquifer.

The size of this project has exposed me to the various opportunities the environmental field offers. Because of its size and the number of different professions working on site, I am able to interact and experience different areas of work. Most of my learning comes when I get to observe a professional in a different field, and understand how their field of specialization involves my own, and how the two professions interact with each other. For example, the vast amount of engineers of different specialties on site each have their own areas of sampling and monitoring.

MDH GRAPS, cont.

The results of this study can be found on the MDH GRAPS webpage, http://www.health.state.mn.us/divs/eh/water/dwp_cwl/localimplem/index.html.

Implementation: through local watershed scale planning efforts

The hope is that the information and management strategies contained within GRAPS report get carried forward into local water management plans, such as the One Watershed One Plan. These planning efforts direct staff time and Clean Water Fund dollars to execute groundwater activities.

Scale of effort

There are two current GRAPS pilots underway, the Pine River Watershed and the North Fork Crow River Watershed. These reports will be available for review later this year. The GRAPS effort will continue to be piloted until the process is better refined to meet the needs of local implementers.

Continue to monitor the progress of GRAPS on the dedicated program page on MDH's website, http://www.health.state.mn.us/divs/eh/water/dwp_cwl/localimplem/index.html.



Figure 1. Here is an Odor Fan that sprays a scented mist, this is used as part of the air monitoring to limit the site's exposure on the public.

As an environmental intern, I have received hands-on application to the environmental and hydrological fields of geology within a business setting. I plan to continue working in the environmental remediation field, to further my experience on sites such as these.

Featured Photo



Safety First! MGWA members Jeff Neisse from Carlson McCain (l) and Tedd Ronning with Xcel Energy (r) demonstrate the use of appropriate PPE during a petroleum release investigation.

The editors invite you to submit photos of members at work for publication. Our membership takes part in a wide variety of activities so let other members see the kind of work you do. Send photos with a caption to anyone on the newsletter team listed on page 2.

Geologic Atlas of Blue Earth County, Part B

Introduction

In June, 2016 the second part (Part B) of the Blue Earth Geologic Atlas was published by the Minnesota Department of Natural Resources (DNR). This atlas is the 26th in this series of geologic atlases which are produced in collaboration with the Minnesota Geological Survey (MGS, Setterholm, 2012). This Part B atlas is the first to be assembled in a report format for easier web viewing.

These atlases are produced to help citizens and local governments understand the geologic setting and inherent pollution sensitivity of the aquifers at a county scale. This information can potentially be used to make land-use decisions that take aquifer sensitivity, water quality, and sustainability into account.

The focus of the atlas is the pollution sensitivity assessment in Blue Earth County for the water-table aquifer, seven buried sand aquifers, and the bedrock surface. Pollution sensitivity is defined

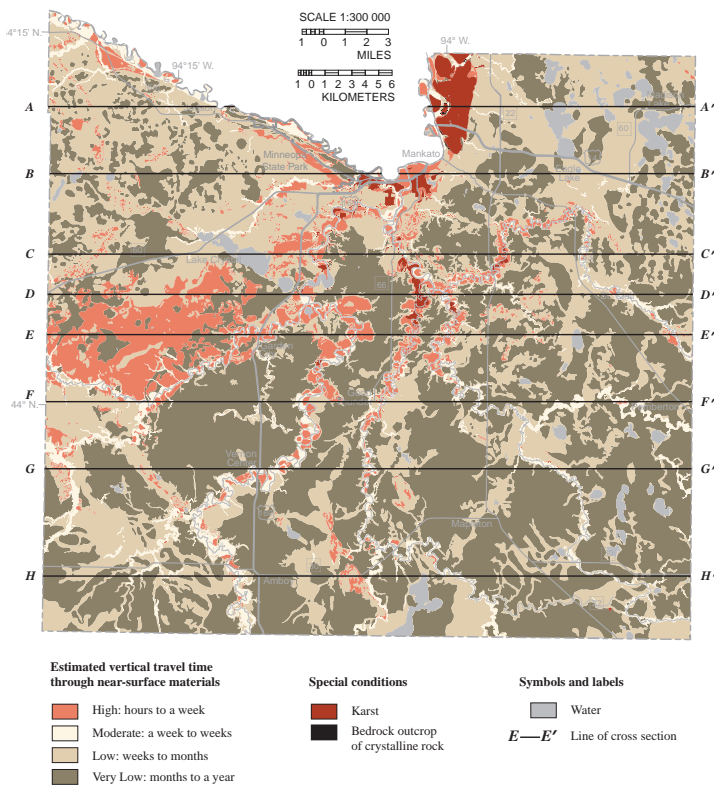


Figure 1. Pollution sensitivity of near-surface materials
 Low to very low pollution sensitivity conditions are common in the eastern and southern portions of the county, with the exception of the larger stream valleys. Moderate to high pollution sensitivity conditions occur in the northwestern portion of the county. This pollution sensitivity model assumes a 10-foot-deep water table and vertical travel of possible pollutants through unsaturated, near-surface materials. Map modified from Minnesota Hydrogeology Atlas series HG-02.

Karst primarily occurs where 50 feet or less of unconsolidated sediment overlies Paleozoic carbonate bedrock, the St. Peter Sandstone, or the Hinckley Sandstone. Karst allows a direct, very rapid exchange between surface water and groundwater and significantly increases groundwater contamination risk from surface pollutants.

by the physical properties that affect downward migration of pollutants to the groundwater. The main variable is the rate that water travels from the surface to the aquifers.

Near surface geologic characteristics and pollution sensitivity

The origin of the county topography and surficial deposits can be traced back to late-glacial events as ice retreated and a proglacial lake formed (Setterholm, 2012, Part A, Plate 3). Layers of silt and clay that settled out of it form the level surface that covers much of the county. The glacial lake sediment overlies layers of fine-grained glacial sediment (till). Areas of sand and gravel are generally thin (0 to 20 feet) and are located north of the Watonwan River in the west-central portion of the county where meltwater streams entered the lake from the west, depositing a sandy delta. Otherwise surficial sand deposits are mostly limited to the six larger river valleys within the county.

The limited extent and thickness of surficial sand across much of the county creates conditions of generally low pollution sensitivity for all aquifers with significant local exceptions in the major river valleys and the west central portion of the county. The geologic sensitivity rating of the near-surface materials (Figure 1) is based on the time range required for water at the land surface to travel vertically through the vadose zone to the water table. The vadose zone is the unsaturated zone between the land surface and the water table. Because the water table is not well mapped everywhere, it is assumed to be at 10 feet below land surface for this calculation.

The travel time through this thin surface layer varies from hours to approximately a year in Blue Earth County, assuming a contaminant moves conservatively with water from the surface to the target. Areas with relatively short travel times (hours to weeks) are rated high or very high. Areas with longer travel times (months to a year) are rated low or very low.

Additional details are outlined in “Methods to estimate near-surface pollution sensitivity, GW-03” (DNR, 2016).

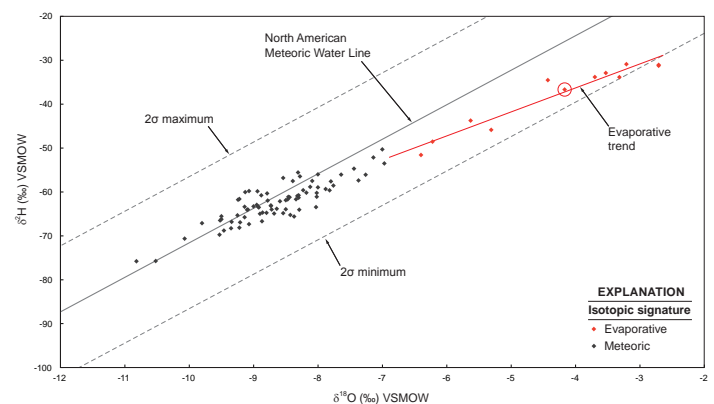


Figure 2. Graph of stable isotope values from groundwater samples
 Stable isotope values from groundwater samples are compared to the meteoric water line. The red symbols that plot beneath the meteoric water line in the upper right portion of the graph represent water with an evaporative signature. Madison Lake appears to have been the source for most of these samples with evaporative signatures. The circled dot represents a sample collected from Madison Lake.

— continued on page 14

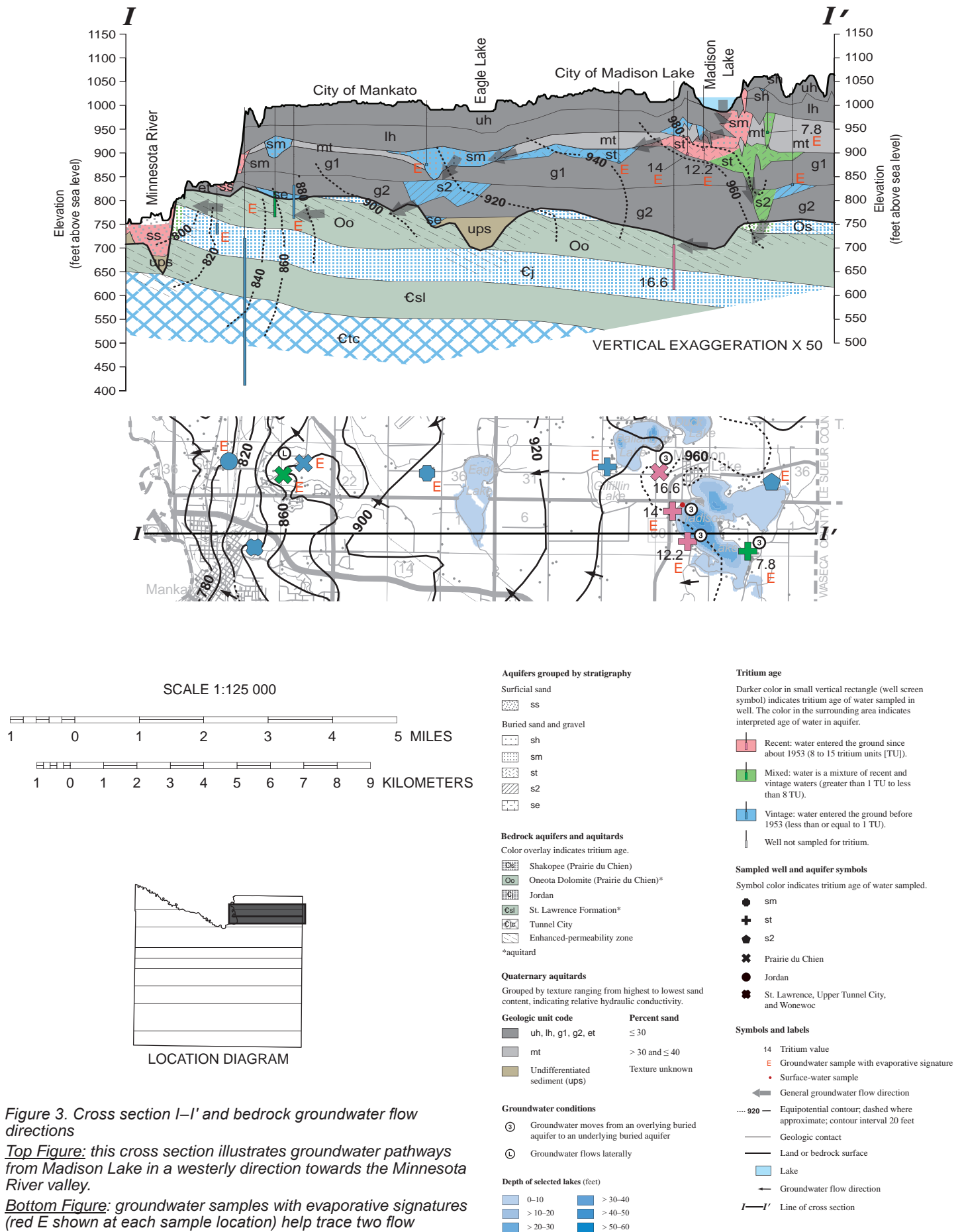


Figure 3. Cross section I-I' and bedrock groundwater flow directions

Top Figure: this cross section illustrates groundwater pathways from Madison Lake in a westerly direction towards the Minnesota River valley.

Bottom Figure: groundwater samples with evaporative signatures (red E shown at each sample location) help trace two flow pathways from Madison Lake to the Minnesota River valley (black arrows).

Buried sand and gravel aquifers and bedrock stratigraphy

Deep sediment layers were deposited during multiple episodes of glaciation during the past 2 million years. An unsorted mixture of clay, silt, sand, and gravel was brought to the region by glaciers and was deposited directly by the ice (till). In places it was sorted as it was deposited by meltwater streams (primarily sand and gravel) and lakes (primarily silt and clay). Glacial deposits are highly variable and the associated sand aquifers are typically thin (20 to 50 feet thick) and discontinuous with lateral extents rarely exceeding several miles. Buried aquifers are typically surrounded by fine-grained, lake- and glacial-sediment layers that serve as aquitards.

The bedrock formations of Blue Earth County are regionally extensive, gently dipping layers of sandstone, shale, and carbonate rock that range from 50 feet to greater than 200 feet in thickness. These formations include in ascending order (oldest to youngest) the Mt. Simon Sandstone, Eau Claire Formation, Wonewoc Sandstone, Lone Rock (Tunnel City Group) and St. Lawrence Formations, and the Jordan Sandstone. The stratigraphically higher and younger layers (Ordovician age) comprise mostly carbonate rock (limestone, and dolostone) and include units such as the Prairie du Chien Group and the Platteville Formation. There are limited occurrences of the Ordovician St. Peter Sandstone in the southeastern portion of the county and scattered occurrences of much younger, Cretaceous marine rocks including shale and sandstone. The aquifers associated with the non-Cretaceous bedrock layers are more commonly used for water by municipalities and commercial operations because of their thickness, extent, predictability, and features that affect water yield.

Source-water connections: stable isotopes of oxygen and hydrogen

Hydraulic connections between surface-water bodies and underlying aquifers can be determined by the relative proportions of the stable isotopes of oxygen and hydrogen in groundwater samples. Precipitation has a characteristic isotopic ratio. Surface water that begins as precipitation has an isotopic composition that lies along a regional trend line or meteoric signature (North American meteoric water line, IAEA/ WMO, 2006). Repeated evaporation and precipitation cycles in surface water cause fractionation of ¹⁶O and ¹⁸O or ¹H and ²H, resulting in different mass ratios (evaporative signatures) in rain, snow, rivers, and lakes. Evaporative signatures resulting from fractionation will plot along a shallower slope than the meteoric water line (Figure 2) (e.g., Ekman and Alexander, 2002; Kendall and Doctor, 2003).

Nine groundwater samples with evaporative signatures were collected downgradient of Madison Lake, the deepest lake in the area having a maximum depth of approximately 60 feet. Lake water is likely seeping into the shallow sm aquifer, which is hydraulically connected in this area to the underlying st aquifer (Figure 3). Five occurrences of samples with evaporative signatures in this area were collected from the deeper st aquifer. As this lake water and groundwater mixture moves downward through these interconnected aquifers, it also flows west toward the Minnesota River valley. Along this flow path the st aquifer has hydraulic connections to the underlying s2 aquifer and the Prairie du Chien–Jordan aquifer.

Pollution sensitivity of Buried aquifers and bedrock surface

The pollution sensitivity modeling process for buried aquifers provides a qualitative evaluation of recharge rate or flow of

surface water into deeper aquifers. This, along with the flow direction (indicated by the potentiometric surface contours), gives a good indication of areas at the surface that may require additional protection. Maps of rapid or focused recharge to specific aquifers are shown in the atlas. Rapid recharge presents a significant risk to groundwater quality.

In focused recharge, overlapping portions of the aquifers may be connected by complex three-dimensional pathways and may allow surface water and pollutants to penetrate into even the deepest areas. These aquifers might otherwise be assumed to be protected because of their depth.

In areas where aquitards are thin (10 feet or less), recent recharge water and pollutants, can travel to the underlying aquifers until a significant barrier such as a thick aquitard is encountered. The sensitivity of the aquifer is inversely proportional to the thickness of that protective layer: the thicker the protective layer, the lower the aquifer sensitivity (Figure 4). The thickness of the protective

Thickness of protective layer between the aquifer and the nearest overlying recharge surface (in feet)				
0–10	> 10–20	> 20–30	> 30–40	> 40
VH	H	M	L	VL

Figure 4. Pollution sensitivity rating matrix for buried aquifers and bedrock surface

layer was calculated by subtracting the elevation of the top of the aquifer from the elevation of the adjacent overlying recharge surface and then ranked for the protection it afforded. These pollution sensitivity models were initially developed by DNR (Berg, 2006) in collaboration with MGS and use custom GIS cross section tools and GIS spatial analyst functions in ESRI ArcMap. The map of the pollution sensitivity for the top of the bedrock surface is included as an example in the Mankato and surrounding areas (Figure 5)

Summary and conclusions

Low to very low pollution sensitivity conditions are common in the eastern and southern portions of the county, with the exception of the large stream valleys where sandier sediment is present. The northwestern portion of the county has near-surface sensitivity values of moderate to high where sandier sediment is common.

The majority of groundwater samples collected for stable isotope analysis across the county showed that most precipitation (normal rain and snowmelt) infiltrated directly into the subsurface and did not reside for long periods in lakes or other surface-water bodies. Isotopic signatures around and downgradient of Madison Lake differ; water with an evaporative signature that was detected in the bedrock aquifers is interpreted as demonstrating a connection between the lake and underlying buried aquifers.

Residence-time analysis of groundwater samples using the radioactive isotope tritium and other chemical species validated sensitivity models that were based on the presence of a specified thickness of protective material (aquitard) overlying each aquifer. Groundwater samples with mixed to recent tritium values correspond to areas of moderate to very high sensitivity and those with vintage tritium values correspond to areas of very low to low sensitivity.

— continued on page 15

Blue Earth Atlas, cont.

Finally, another interesting discovery not covered in this article were the common occurrences of elevated arsenic values in groundwater samples from wells in contact with glacial sediment of the New Ulm Formation (73 percent or 16 of the 22 sampled wells in the New Ulm Formation).

The Geologic Atlas of Blue Earth County, Minnesota, Part B is available as printed copies through the MGS: <http://www.mngeo.state.mn.us/mapsales.html> or Blue Earth County Environmental Services Department by contacting Julie Conrad, Land Use and Natural Resources Planner at (507) 304-4381, Julie.Conrad@blueearthcountymn.gov, <http://www.co.blue-earth.mn.us/index.aspx?nid=96>

References cited

Berg, J.A., 2006, Sensitivity to pollution of the buried aquifers: Geologic Atlas of Pope County, Minnesota, Minnesota Department of Natural Resources, County Atlas C-15, pl. 9, Scale 1:150,000.

Ekman, J., and Alexander, S., 2002, Technical appendix to part B in Regional hydrogeologic assessment, Otter Tail area, west-central Minnesota: Minnesota Department of Natural Resources, Atlas Series RHA-5, 13 p.

Kendall, C., and Doctor, D., 2003, Stable isotope applications in hydrologic studies, chap. 11 of Holland, H.D., and Turekian, K.K., eds., Surface and ground water, weathering, and soils: Amsterdam, The Netherlands, Elsevier, Inc., Treatise on Geochemistry, v. 5, p. 319–364.

DNR, 2016, Methods to estimate near-surface pollution sensitivity: Minnesota Department of Natural Resources, St. Paul, GW-03, http://files.dnr.state.mn.us/waters/groundwater_section/mapping/gw/gw03_ps-ns.pdf.

Setterholm, D., 2012a, Geologic atlas of Blue Earth County, Minnesota: Minnesota Geological Survey, County Atlas Series C-26, Part A, 6 pls.

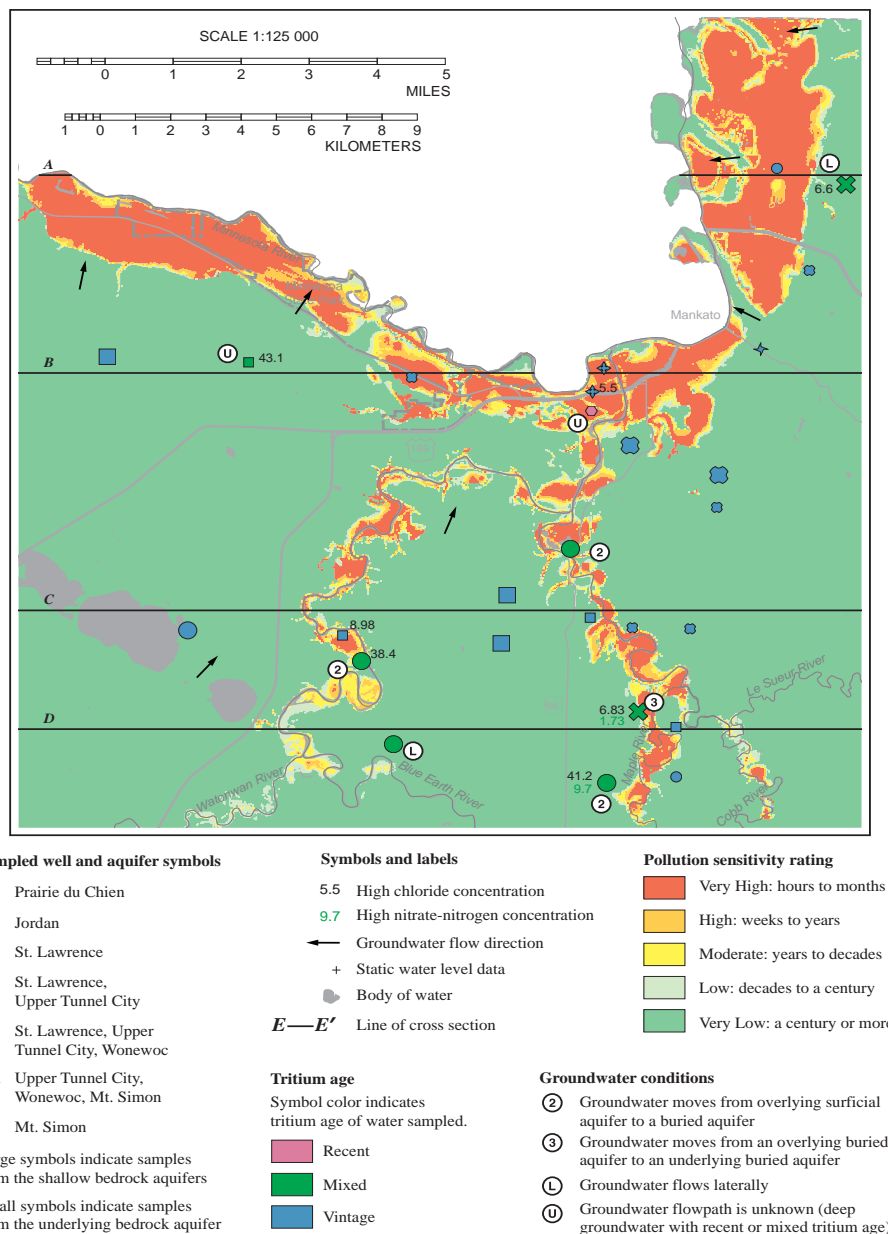


Figure 5. Pollution sensitivity of the bedrock surface and bedrock groundwater flow directions

NEW PUBLICATIONS / LINKS

New Study Shows High Potential for Groundwater to be Corrosive in Half of U.S. States

A recent U.S. Geological Survey assessment of more than 20,000 wells nationwide indicates that groundwater found in 25 states and the District of Columbia has a high potential for being naturally corrosive.

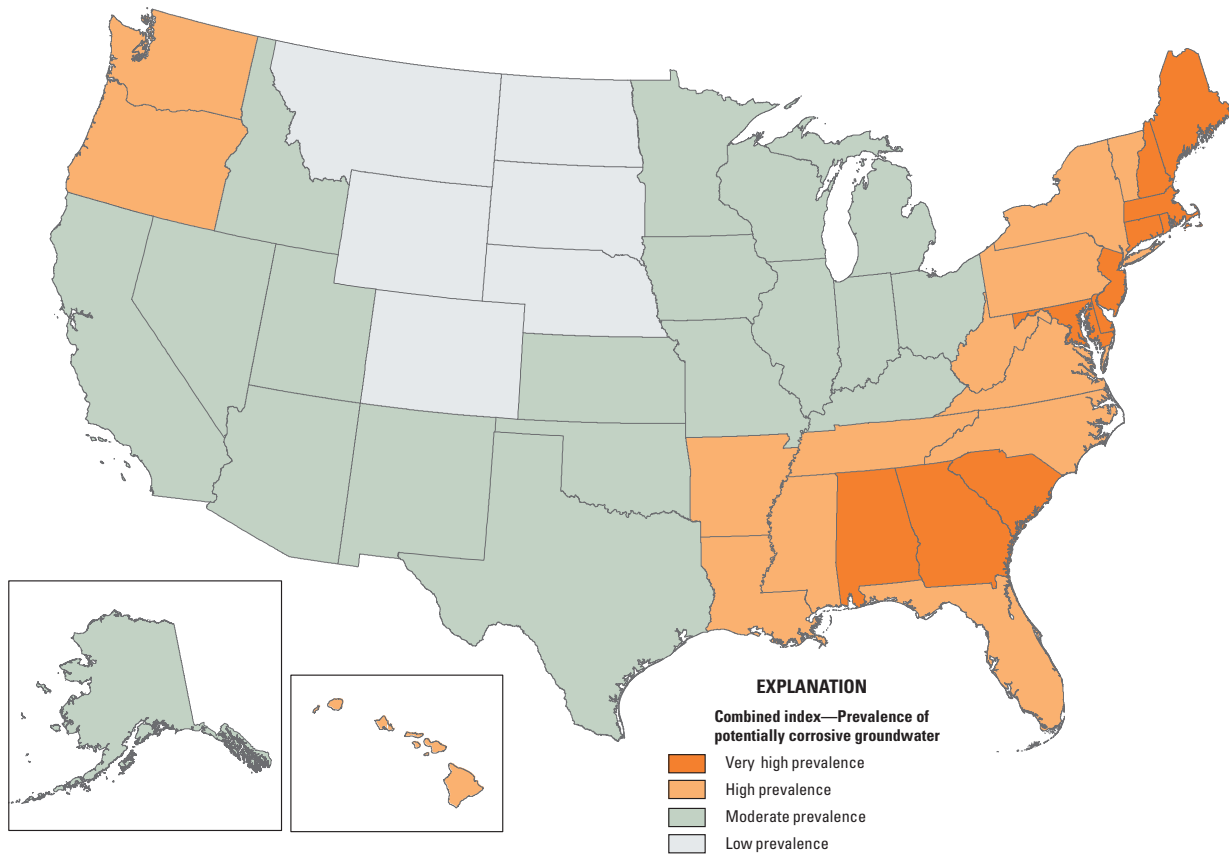
The findings have the greatest implications for homeowners with private drinking water systems. Naturally corrosive water is not dangerous to consume by itself. Nevertheless, it can cause health-related problems by reacting with pipes and plumbing fixtures in homes. If plumbing materials contain lead or copper, these metals may be leached into the water supply by corrosive water. Signs of corrosive water causing leaching of metals may include bluish-green stains in sinks, metallic taste to water, and small leaks in plumbing fixtures.

Two indicators were used to assess the potential corrosivity of groundwater. The first index is the Langelier Saturation Index, an indicator of whether mineral scale may form on the inside of pipes and prevent the release of lead to drinking water. The second indicator, the chloride-to-sulfate ratio, measures the potential of source water to promote the release of lead in pipes through galvanic corrosion.

These two indicators were combined into one indicator to assess the prevalence of potentially corrosive groundwater nationwide.

View maps, download the data, and learn more about this national assessment of groundwater corrosivity online.

For additional information, contact Ken Belitz, Chief, Groundwater Assessment-National Water-Quality Assessment Project kbelitz@usgs.gov



The prevalence of potential corrosive groundwater was highest in 25 states in the northeast, southeast, and northwest. About 24 million people in these states are dependent on private water systems for drinking water.

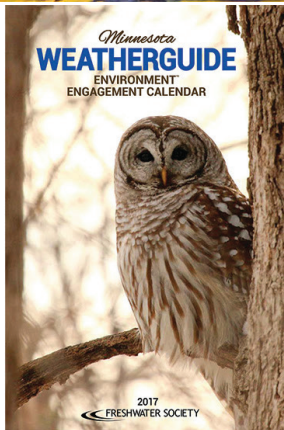
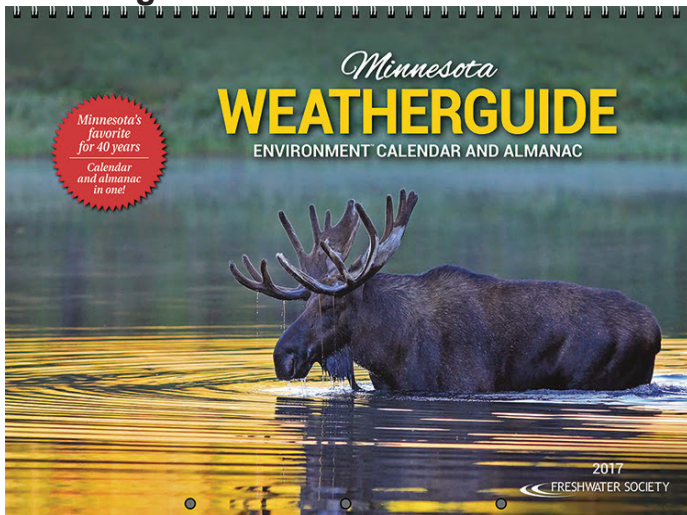
Links of Interest

Researchers from University of Wisconsin find manure application has led to groundwater contamination:
<http://www.mdpi.com/2079-9276/4/3/655/pdf>

3m Reduces Pumping Levels at Former Landfill:

<http://www.swcbulletin.com/news/region/4086225-3m-reduces-pumping-levels-former-dump-site>

Weatherguide Sales Benefit MGWAF



The calendar has been Minnesota's favorite calendar for 40 years and comes in both a wall and engagement format. It includes daily information on sunrise/sunset times, moonrise/moonset, normal and record high/low temps, and record precipitation, along with moon phases, significant events and special dates, meteorology, phenology, astronomy, and amazing regional photography. Enjoy nature notes by Jim Gilbert (WCCO radio), articles by your favorite KARE 11 and MPR meteorologists, and gardening tips from Grow with KARE.

SUN R/S 6:22 am 8:08 pm	21
MOON R/S 6:07 am 8:16 pm	
NORMALS Max 80/Min 61	1:30 pm: New Moon Harvest (Ojibwe)
RECORDS High: 98/1947 Low: 44/2004 Pcpn: 3.64/1924 Snow: 0	(Solar eclipse: begins 11:44 am, max 1:07 pm, end 2:29 pm)

Support Minnesota Groundwater Association Foundation and get a start on your holiday shopping!

The Minnesota Weatherguide Environment™ Calendar and Almanac makes the perfect gift under \$20 for everyone on your list: teachers, parents, grandparents, aunts, uncles, friends, colleagues and co-workers, party hosts, and nature enthusiasts. They will appreciate it every day and use it all year long.

The Minnesota Ground Water Association Foundation is participating in the Freshwater Society's fundraising program. \$5 from every calendar sale will go directly to the MGWAF when you use the group fundraiser code: **2017MnGwtrAF**.

Go to freshwater.org/fundraiser and enter the code at checkout!

What Kind of Science Do You Need?

Groundwater and Waste Water Testing | Phase 1 & 2 ESA's
Water Resource Planning | Soil, Water, and Vapor Sampling
Industrial Hygiene | Hazardous Materials Inspections

BRAUN
INTERTEC
The Science You Build On.

952.995.2000 | braunintertec.com

MGWAF BOARD MINUTES

MGWA Foundation Board of Directors

President

Scott Alexander
University of Minnesota
(612)626-4164
alexa017@umn.edu

Secretary

Amanda Strommer
Minnesota Department of
Health
(507) 649-0854
amanda.strommer@state.mn.us

Treasurer

Cathy von Euw
Stantec
(651)255-3963
cathy.voneuw@stantec.com

MGWA Liaison

Lanya Ross
Metropolitan Council
(651)602-1803
lanya.ross@metc.state.mn.us

Director

Stu Grubb
Northeast Technical Services
(651)351-1614
grubbss@aol.com

Director

Eric Mohring
Board of Water and Soil
Resources
(651)297-7360
eric.mohring@state.mn.us

**The MGWA Foundation
is a 501(c)3 charitable
organization. Donations
to the Foundation are
deductible on your state
and federal income tax
returns.**

MGWA Foundation Minutes

Meeting Date: June 16, 2016

Members Present: Members Present: Scott Alexander, Cathy von Euw, Eric Mohring, Stu Grubb, Stephanie Souter, and Amanda Strommer (via conference call)
Others Present: Sean Hunt, MGWA Management and Kent Seward, Wells Fargo Advisors

Current Business: Review Draft Investment Policy Statement
Kent Sward from Wells Fargo Advisors and Stu went over a summary of the subcommittee meeting and a draft of the investment policy. Kent gave the board a detailed overview of his responsibilities as the investment manager. Changes were made to the draft policy. Risk tolerance is moderate. The changes will be routed via email for board approval. Then Kent will set up the new accounts and funds will be transferred.

New grant applications.

Metro Children's Water Festival for \$2,000-

Eric made a motion to approve and Stu second. All in favor; motion carries.

Heinle UW Madison for \$1,000-

Application is for a design flow apparatus to be used for teaching within lab setting. Concerns with setting precedent that if a student is not funded through the scholarship that they could obtain funds through the grant program. Discussion on if the application fits the grant criteria. Possibly could use funds but with qualifier that intent of funds is to provide education. Scott will contact applicant to discuss and ask how it would be used and which classes it would be used for. Board discussed that it would be helpful if there was a summary of how to construct one of these as an end product that could be provided and shared with other educational institutions. Then vote via email.

Stu made a motion to approve grant proposal for \$1,000 with conditions that Scott contact him and obtain amendment that specifies deliverable of a construction manual and specific courses it would be intended to be used for and that it be openly available, Stephanie seconded. All in favor; motion carries.

March 18, 2016 Meeting Minutes.

Stu made a motion to approve and Cathy seconded. All in favor; motion carries. Minutes sent to newsletter.

Review current years finances.

Total for the MGWAF fund is \$146,448.28 as of 6/11/16. Total for the HOP fund is \$30,334.10. Credits since last meeting included the donations, Amazon smile, and returned student scholarship checks from conference. Debits this quarter include \$2,000 for the student scholarships. HOP also continues to receive credits from donations.

Update of Scholarship Policy.

Carry forward to September meeting.

MGWA Liaison Report.

Report by Sean – MGWA Board met and discussed anticipation of funds from previous calendar years and discussion of where funding should go. Amanda and Sean will look back to previous years funding but average is \$5,000 a year in spending. Welcome to new board member Stephanie Souter who was officially approved by the MGWA board!

MGWA BOARD MINUTES

Minnesota Ground Water Association Board Meeting Minutes

Meeting Date: Tuesday, June 14, 2016

Location: Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN

Attendance: Ole Olmanson, President; Evan Christianson, President-Elect; Emily Berquist, Treasurer; Andrew Retzler, Secretary; Sean Hunt, WRI; Jeanette Leete, WRI; Kelton Barr, MGWA White Paper

Past Minutes: Approved.

Newsletter: Newsletter has been passed to Leete and is still being compiled. Expected completion end of June.

Treasury: Berquist discussed the treasury report with the Board. The total income for the period of January 1, 2016 – June 14, 2016 is \$64,684.88; total assets for this period are \$131,231.93. Net income from January 1, 2016 – June 14, 2016 is \$12,366.16.

Web Page: Minor updates were made to the web page. Hunt received the Spring Conference recordings from the University. Recordings still need to be processed and added to the conference web page. Migration of web page content from the old system to the new WordPress system still planned for the near future.

WRI Report: Hunt discussed membership numbers with the Board. Membership is down compared to this time last year. Hunt and Leete reported that the Sinkhole Conference accounting issue from last meeting has been resolved.

MGWAF: MGWAF is currently discussing and reviewing investment options and plan to meet with a Wells Fargo investment banker at their next meeting. MGWAF will also be discussing student scholarships and two funding requests. Leete suggested that MGWAF prepare a rough budget for the Board to make better decisions as to where funds are needed the most when gifting MGWA surplus funds. The Board discussed this idea and agreed. Hunt will discuss this idea with the MGWAF at their next meeting.

Old Business: White Paper. Barr updated the Board on the status of the current and future white papers. The white paper on gaps in groundwater education has sent out several surveys to MGWA membership and industry professionals, and the results are being compiled and analyzed. This white paper group is on schedule to be done by the Fall Conference. Their aim is to have a first draft to the committee in early July, and possibly a final draft to the Board in late August. Christianson asked whether or not the results of the surveys would be included in the white paper report. Barr responded that results will likely be placed within the appendices of the paper as long as the reported results don't interfere with any confidentiality agreements. Barr reported that the committee just finished tallying volunteers for the next white paper topic on drain tiling. Fourteen applicants volunteered, and 3 withdrew due to scheduling conflicts and/or conflicts of interest. A couple of the volunteers will need to become MGWA members to participate. Barr and Hunt will look into this. Barr commented that this white paper group highlights a diverse and balanced collection of volunteers with backgrounds in academia, groundwater research, and industry professionals having firsthand experience with drain tiling. Andrew Streitz is working to set-up their first meeting as a white paper group. Barr also discussed with the Board the meeting between the White Paper Committee and Tom Meersman, a Star Tribune reporter, and the benefits this will have on the writing style of the white papers to make them more accessible and captivating to a wider audience.

Social Hour. The Board tentatively plans to host another Social Hour on Wednesday, July 27 at Urban Growler. Recommendations from past Social Hour events were taken into consideration and will be utilized, such as tabletop signs, nametags, and a better description of the Social Hour location. Berquist will be in contact with Urban Growler to make reservations.

New Business: Fall Conference Topics. The Board discussed ideas and topics for the 2016 Fall Conference. Hunt reminded the Board that pre-registration for the conference will begin in October, and recommended that conference details be finalized by September at the latest.

Board Meeting Time. Scheduling conflicts prevented the Board from meeting during the previously agreed upon time of the first Thursday of every month. The Board agreed upon a new meeting time of the second Tuesday of every month. There will not be a Board meeting in the month of July. The next Board meeting will take place on Tuesday, August 9 from 11:30am – 1:00pm at Fresh Grounds Café.

Meeting Date: Tuesday, August 9, 2016

Location: Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN

Attendance: Ole Olmanson, President; Lanya Ross, Past President; Evan Christianson, President-Elect; Emily Berquist, Treasurer; Jeanette Leete, WRI; Sean Hunt, WRI; Tedd Ronning, Newsletter Editor, Samira Reul von Laufenberg (DNR intern), Guest

Agenda: Approved with the addition of two items: 1) Minnesota Water Reuse interagency work group and 2) money for the MGWA Foundation.

Past Minutes: Approved, with correction to A) the spelling of Tom Meersman's name and B) the

MGWA Newsletter September 2016

MGWA 2016 Membership Dues

Sustaining Member	\$65
Professional Member:	\$45
Retired Member	\$25
Full-time Student Member	\$20
Newsletter (printed and mailed)	\$20

Membership dues rates were revised at the July 1, 2015 meeting of the MGWA Board.

ECAD
Engineering

*Environmental Concepts &
Design, Inc.*

**Celebrates 20 year
Anniversary**

1996-2016

**St. Paul & Walker, MN
1-800-709-5263**

www.ecadEngineering.com

MGWA BOARD MINUTES

MGWA Board Meeting Minutes, cont.

The MGWA Board meets once a month, currently over lunch, on the second Tuesday at Fresh Grounds on W 7th Street in St. Paul.

Members are welcome to attend and observe

- Newsletter:** reason for changing the meeting day due to schedule conflicts. The newsletter was completed and sent out. The newsletter team is always looking for articles and member news. In discussion, Leete noted that Jay Frischman was just promoted to Steve Thompson's former position.
- Treasury:** Berquist discussed the Treasury Report with the Board. For the period January 1, 2016 to August 9, 2016, total expenses are \$58,012.13; net income is \$6,959.49. As of August 9, 2016, MGWA has \$123,723.53 in Checking/Savings and total liabilities and equity of \$125,825.26. As of August 9, 2016, the net income for MGWA's programs is \$18,499.86 and administrative labor expenses are \$20,713.00.
- Web Page:** WRI and Olmanson are working on a draft of the updated website, with the goal of switching over before conference registration opens. Olmanson and Hunt will coordinate to set up conference registration using the new system.
- WRI Report:** WRI Report: Leete pointed out that MGWA has yet to give last year's profits to the MGWA Foundation; only approximately \$16,000 were transferred the year before that. Leete suggested transferring approximately \$80,000 to the MGWA Foundation. This would reduce the amount in the MGWA checking account to less than \$40,000, which would still allow MGWA to address upcoming conference and other budget needs. Ross moved that MGWA transfer \$80,000 to the MGWA Foundation. Christianson seconded the motion. A vote was called; all Board members present voted in favor. The motion passed. Hunt reported on membership, which is generally slow this time of year. He raised the question of turning students into automatic members when they register for conferences. Previously, student conference attendees weren't turned into members like other conference attendees are. With changes in how email/contact information changes, keeping students as year-long members is more feasible than it was in the past. Christianson moved for a MGWA policy change so that students who sign up for conferences will be signed up for the year as members. Berquist seconded the motion. A vote was called; all Board members present voted in favor. The motion passed. Leete reported that WRI is currently filling out taxes for the year.
- MGWAF:** The MGWA Foundation awarded \$2,000 to the Metro Children's Water Festival and a grant of \$1,000 for an educational tool being developed at the University of Wisconsin. MGWAF is also discussing investment policy, which is being led by Stu Grubb.
- White Paper:** Education white paper: Hunt reported that a survey is being developed to identify qualifications that employers are looking for in applicants for groundwater positions. Hunt sent a draft to Bruce Olson. Drain Tile white paper: Hunt reported that the work group had a kick off meeting and is getting set up with Google Drive.
- Old Business:** Social Hour: Berquist suggested Sporty's Pub & Grill on Como Avenue in Minneapolis. This location is near a superfund site that students are learning about in Tipping's hydro course at the U of M. She suggested hosting the next social hour in October, when students are most likely to attend. Fall Conference: Olmanson led a discussion of the Fall Conference. The proposed title is 'Modern Advances in Groundwater'. He has one confirmed speaker: Greg Brick, DNR, to provide an update on the Spring Inventory. The Board discussed other potential speaker topics, including:
- ◆ Two recent MGS studies
 - ◆ An update on White Bear Lake, if USGS reports are ready, which could include a technical discussion as well as discussion of setting protection elevations
 - ◆ White Paper Education Committee update
 - ◆ Extended MGWAF presentation
 - ◆ Using LCCMR grant database to identify possible topics. For example, naturally occurring copper-nickel bedrock (maybe tie to copper sulfide mining)
 - ◆ Crystal Ng's work on the Bemidji oil spill with a student researching sulfides and wild rice
 - ◆ NASA remote sensing and drought prediction
 - ◆ Smart wellfields
 - ◆ MDH policy discussion of well code updates and/or new contaminants (current state of these moving targets)
- Olmanson will follow up on leads before the next meeting. Olmanson asked if any awards would be given at the fall conference, and asked about bringing the Water Bar to the conference. Ross noted that she was working with Metropolitan Council to pay for Water Bar at the conference. The Board offered to comp the exhibitor rate for the Water Bar exhibit.
- New Business:** The interagency coordination team on reuse is soliciting an MGWA member for a stakeholder advisory group. Ross moved to appoint Olmanson as the MGWA representative to Minnesota's Water Reuse Interagency Work Group's Stakeholder Advisory Group. Christianson seconded the motion. A vote was called; all Board members present voted in favor. The motion passed.
- Next Meeting:** Tuesday, September 13, 2016

Save These Dates

2016 and 2017 MGWA Conferences

11/16/2016

4/26/2017

11/15/2017

DAKOTA TECHNOLOGIES

HIGH RESOLUTION SITE CHARACTERIZATION SPECIALISTS

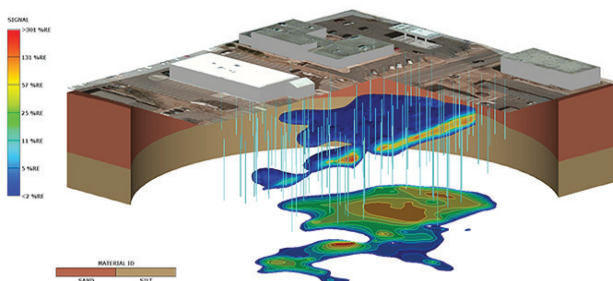
Dakota Technologies provides state-of-the-art services for hazardous waste site investigations, specializing in the rapid site assessment of subsurface LNAPL and DNAPL.



Our rapidly growing fleet of equipment includes **11 UVOST** and **5 TarGOST** units, along with **multiple MIP, HPT** and **combination LIF-HP** units. Our team of expert operators is ready to mobilize **nationwide** to meet all of your time-critical project needs.

Dakota's HRSC Services Include:

- ◀ **UVOST® & UVOST-HP**
Petroleum LNAPL screening
Hydrostratigraphic profiling
- ◀ **TarGOST® & TarGOST-HP**
Coal tar and creosote screening
Hydrostratigraphic profiling
- ◀ **DyeLIF™**
Chlorinated DNAPL screening
Hydrostratigraphic profiling
- ◀ **Membrane Interface Probe & MiHpt**
VOC screening & hydrostratigraphic profiling
- ◀ **Hydraulic Profiling Tool**
Hydrostratigraphic profiling
- ◀ **Advanced Data Analysis**
Maximize LIF data value
- ◀ **Data Visualization**
2D & 3D Conceptual site models



www.dakotatechnologies.com
info@dakotatechnologies.com
701.237.4908

Maple Grove, MN | Morris, MN | Kansas City, MO | Fargo, ND | Columbus, OH | Charleston, SC