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LETTER FROM THE PRESIDENT

By Rick Peterson, WWWA President

Greetings everyone,

As Summer has fully arrived in Wisconsin, so has construction season. It is getting difficult to plan out routes that don't involve some kind of detour around some construction project. I guess that's the price we pay for living in such a beautiful state with the many distinct seasonal changes that affect the roads we travel.

Speaking of travel, as we drive around from job to job, I hope you have a little chance to enjoy the scenery around you. We are truly blessed with an abundance of natural wonders throughout this great state.

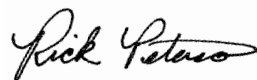
The Association continues to be busy with committee work through the Summer dealing with Continuing Education, Code updates and Convention planning. The DNR has asked the WWWA for input on different issues relating to Continuing Education which we will share with you as we receive more information through continued dialog with them.

The Association has been responding to some extreme weather situations involving flooding in certain areas of the state by quickly adjusting and running the appropriate TV commercials and issuing press releases regarding the need to test your well water after such events happen. Our Association management team is on top of things and very quick to respond when the need arises. We have also had a measured response to some political ads that were generalizing, and painting well water in a bad light.

I hope that you are all enjoying the issues of the Well Log that you have been receiving and see the value in such a newsletter. We will continue to strive to publish a newsletter that is worthy of your time and is relevant to our industry. I strongly encourage anyone to submit articles related in any way to our industry and the things that affect it. We need to hear your thoughts and opinions on various issues related to our precious resource.

Again, as I have in past letters, I urge you to take time from your busy schedules to spend time with your families and friends enjoying all that our state has to offer in this oh-so-short of a time called Summer in Wisconsin. 💧

Enjoy and be safe,



Rick Peterson, Clean Water Testing
920-841-3904, rick@water-right.com



WWWA BOARD OF DIRECTORS

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WPWS REPORT

By Jeff Beiriger, WPWS Executive Director

WWWA ADDS TO TALLY FOR WELL PROJECT

During the Spring Golf Outing, it was announced the Wisconsin Water Well Association had donated a portion of the proceeds from the Bowling Tournament at the Annual Groundwater Conference to help support the well project. Directors, at their most recent Board meeting, agree to round up that contribution so that a total of \$1,000.00 was raised by the WWWA for well projects.

Many thanks to everyone who helped make this contribution possible. Through the work on the well projects in Uganda and other locations, we are bringing much-needed water to communities, but we are also raising awareness about the importance of groundwater and the well drilling and pump installing business in Wisconsin.

WATER WALKS

WPWS has created a step-by-step instruction sheet for holding a Water Walk in your area. A Water Walk is a half-day event where a group (school, church, civic, business) makes a walk with empty containers, fills them, and then makes the return walk with the filled containers. The walk recreates locally the experience of many communities in the world, where water is obtained by walking to a water source rather than having it available in their homes or a more central location in their community.

Pledges are secured prior to the walk and collected by the participants in the days following and the money raised is

then donated to the well fund for a future project. The events have an educational component too, with information about groundwater, well drilling, the recipient community, site conditions, and more provided to participants either the day of or in the days ahead of the walk itself.

A walk with as few as 20 people raising \$50.00 each provides \$1,000.00 for the well fund and it takes just \$5,000.00 - \$7,500.00 to provide each drilled well. A Water Walk in your area can bring attention to our industry and goodwill for your business and help us accomplish more in the years ahead.

For more information, contact the WPWS at (888) 782-6815 or jeff@assocmgmtservices.com. The information is also available through the WWWA website at <http://www.wisconsinwaterwell.com/>.



EXECUTIVE DIRECTOR MESSAGE: WANT TO GET MORE INVOLVED? SOON YOU CAN!

By Jennifer Rzepka, CAE, WWWW Executive Director



An exciting change is coming for WWWW in 2019. The Board of Directors has recently decided to reorganize the way that the activities of the organization are currently handled. Today all the work of the association is done at the Board table, by the entire Board, and is reported on by Taskforce groups focused on a specific topic.

By definition, a Taskforce is formed when there is a specific objective to achieve, and when that task is complete, the Taskforce is disbanded. However, planning the recurring Annual Conference, or considering the future year's Legislative platform are not Taskforce-type of activities.

To be more representative of how the WWWW really works, five formal Committees will be created (with Subcommittees as needed), and any specific Taskforces that are still needed will fall under one of those Committees. All members will be invited to work on projects and serve on these Committees. Becoming involved as a Committee member or in the work of a Taskforce is a great way to see if a leadership position is something you'd like to consider in the future.

The chart to the right shows how the workflow will change if this is adopted by the membership.

Once the necessary bylaws amendments are drafted by the office and vetted by the Board of Directors, they will be proposed to the voting membership for consideration at the 2019 General Membership Meeting. In the meantime, please reach out to the office or any member of the Board to ask questions or volunteer if this is work you'd like to do starting in 2019. 💧

Jennifer Rzepka, CAE

Jennifer Rzepka, CAE
Executive Director

Current Taskforces	Proposed Committees
Legislative	Legislative Committee All these Taskforce topics are regularly monitored and reported on by the WWWW Lobbyist, Jeff Beiriger. As necessary, they will fall within this committee when regulatory and legislative topics or other matters concerning the DNR arise.
GeoThermal	
PVC Well Issues	
Other Boreholes	
NR810/820	
NR812	Convention Committee Since the work of this group is on an ongoing basis, and more members than just the Board of Directors can be involved in the planning, formation of a Committee broadens the opportunity for the membership at large.
Convention	
Continuing Education	Education Committee The logistical work of planning the schedule, timing, location, the DNR review and reporting process and other details of the Continuing Education events are all handled within the WWWW office. The primary role of this former Taskforce was to identify the speakers and topics, so this new Committee will have a strategic, forward-thinking scope of considering what the current and future needs of training are for pump installers, well drillers and those working with heat exchange.
Media	Communication/Marketing Committee The role of this taskforce has morphed over the years, most significantly with the reimplemention of the newsletter in 2017. The focus has been on television commercials, but is now more broad as it addresses those, the newsletter, social media and the website. In the future a subcommittee will be formed under this committee to look into a website overhaul.
Membership	Membership Committee Though there's no change in name, there will be a very targeted, two-prong focus of this Committee: retention (keeping current members satisfied) and recruitment (bringing in new members). Both are critical tasks that need constant and continual focus for an organization to thrive. The office will be instrumental in handling the task work, renewal process, follow-up and building of contact databases, but it's a colleague asking a colleague about WWWW that makes tremendous difference in a member's choice in joining and renewing their dues.

LOBBYIST REPORT: ELECTION SEASON COMES EARLY IN 2018

By Jeff Beiriger, WPWS Executive Director

The legislative session has been over for a couple of months now, allowing legislators to spend time in their districts ahead of the Fall elections. Before we fast forward to November, let's not forget the special election held in June and the August primary.

In early June, a Senate seat and an Assembly seat were up for grabs as the Walker administration was ordered by a judge to conduct a special election for the seats. The judge ruled that citizens should not go without representation for nearly a year. The administration noted that the expense of the election was unwarranted since the winners of the special elections would be seated after the session had ended, giving them little or nothing to do on behalf of the districts' residents. Following the judge's ruling, the Walker administration considered an appeal, but decided instead to order the special elections.

In the Assembly district vacated by Keith Ripp, covering most of Columbia County and western Dodge County, Jon Plumer, a Republican, was elected with 53 percent of the vote. His Democratic challenger, Ann Grove Lloyd, received 45 percent of the vote. Notably, her performance in the district was considerably better than Democrats had performed in the 2016 elections.

In the Senate district vacated by Frank Lasee, covering much of Northeast Wisconsin, Democrat Caleb Frostman won the election over Andre Jacque by 2.5 percentage points. While the margin of victory was not huge, the shift in the district from earlier elections, including the 2016 Presidential election, was, creating optimism for Democrats as they look to the Fall elections.

While Democrats would love to control the Governor's office and the State Assembly, it's the State Senate where they believe they have their best chance to take over at least one part of State government and in doing so, slow or halt the Republican agenda that has been advancing unchecked since the 2010 elections gave Republicans control of the legislature and Governor's office, but perhaps more importantly, the redistricting process, which can affect future elections.

Recently, the Wisconsin redistricting plan was challenged in the U.S. Supreme Court and the Court decided to not decide. While this gives Democrats a chance to challenge the district maps again, it also leaves the existing maps in place for upcoming elections. Essentially, the Court held, in a technical ruling, that the case before them needed to specifically identify who was damaged by the redistricting

maps and couldn't be decided by the Court absent a grieved party.

With another pickup earlier in the year, Democrats have now picked up two Senate seats in two special elections. Low turnout elections have generally favored Republicans, so this is cause for optimism for Democrats, but both sides will really dial up their efforts leading into the general election, especially with the governor's office and a U.S. Senate seat at stake.

For Democrats, their pick for the U.S. Senate is clear – incumbent Senator Tammy Baldwin. Republican candidates have been in a fierce battle for their party's nomination, but that won't come until a primary in August. That extended battle bodes well for Baldwin as Republicans commit more and more resources to the primary election rather than the general.

On the flipside, Democrats have failed to coalesce around a candidate for Governor, though a few candidates have started to vacate the field following the Party's primary and recent polling data. If Democrats are still in a fierce primary battle themselves, they too could be squandering resources that could otherwise go toward the general election, giving back any advantage they might have gained from the disputed Republican primary for the U.S. Senate.

Things will be in full swing come the primaries and really go into high gear after Labor Day. Most recently, Democrats have seen some of their early polling leads slip and incumbent Republicans have seen an uptick in their favorability, including the President and Governor Walker. Mostly, voters are pointing to the economy as the reason for their increasing favorable ratings, so much may depend on the direction it takes over the next few months. A downturn could certainly derail Republican hopes that they will be rewarded for their efforts to shrink government and lower taxes.

All in all, this one is going to be as hard to predict and polling data, in light of the 2016 elections, must be taken with a grain of salt. Even in a worse-case scenario for Republicans, they'll still control the White House and, most likely, the Wisconsin Assembly, so the effects will likely yield more of a stalemate than a change in direction. Then things *really* get interesting going into 2020! But let's not get too far ahead of ourselves.... 💧



BEHIND THE SCENES IN LOS ALAMOS

By Lori Huntoon, Newsletter Editor

Lori Huntoon, Newsletter Editor and former WWSA Board Member, has recently relocated to New Mexico to participate in the Los Alamos Legacy Cleanup Contract for the Los Alamos National Laboratory.

As the Groundwater Monitoring Supervisor for Newport News Nuclear BWXT-Los Alamos (N3B), Huntoon works with Tetra Tech, which leads the entire Water Program scope of work as Tech2Solutions (a joint venture with Sealaska). The environmental work is conducted by N3B under contract to the U.S. Department of Energy, Office of Environmental Management.

A bit of history:

Located in northcentral New Mexico, Los Alamos was selected as the location for design and development of the first nuclear weapon in late 1942. A top-secret facility, the area provided controlled access, steep canyons for testing high explosives, and the ability to design infrastructure (including nuclear reactors) within the canyons that could not readily be seen from above. Since its inception in 1943 as part of the Manhattan Project, Los Alamos National Laboratory's primary mission has been nuclear weapons research and development.

The laboratory's focus continues to be a solution to national security challenges through scientific excellence. Today, the laboratory is responsible for the design surety of nuclear weapons, in addition to the safety, security, and effectiveness of the nuclear stockpile, as well as nuclear nonproliferation and counter-terrorism, particle accelerator developments, health physics, fusion power research, and significant super-computing capabilities. Health research includes recent breakthroughs on a potential HIV/AIDS vaccine and cancer detection and treatment technologies.

The Project:

The Los Alamos Legacy Cleanup Project is responsible for protecting the regional aquifer and reducing risks to the public, workers, and the environment associated with legacy waste material, facilities and sites.

The objectives of the project include:

- protect, characterize, and monitor the regional aquifer;
- clean up contaminated media and contaminated legacy waste sites at Los Alamos National Laboratory and surrounding private- and government-owned lands, including groundwater and surface water;
- decontaminate, decommission and demolish inactive facilities;



Plutonium utilized in nuclear weapons development



View of Los Alamos and the Los Alamos National Laboratory



Replica of Fat Man, WWII Plutonium Bomb Dropped on Nagasaki in 1945

Los Alamos continued on next page

- retrieve, characterize, and prepare legacy mixed-low level radioactive waste and transuranic waste for shipment off-site, and;
- eventual transfer of sites to the National Nuclear Security Administration for long-term surveillance and monitoring as needed, or to the County of Los Alamos for redevelopment.

The N3B Los Alamos Legacy Cleanup Contract is valued at approximately \$1.75 billion over ten years. The Water Program scope of work includes:

- Groundwater Monitoring
- Well Drilling
- Surface Water Monitoring
- Storm Water Corrective Actions
- RDX Contamination Remediation
- Hexavalent Chromium Remediation

RDX (Royal Demolition Explosive or Research Department Explosive) has been detected in samples collected from springs, perched groundwater in alluvial wells (75 feet bls), and wells completed in the regional



Angle drilling of remediation well

aquifer (greater than 1000 feet bls). The plume of hexavalent chromium contamination is approximately a half mile wide, and extends over a mile long. The contaminant plume is located within the upper 75 feet of the regional aquifer. Due to complex site geology, diagonal drilling has been utilized to locate wells beneath mesas and sensitive areas. Monitor wells cost \$2M-\$3M each to install and develop. 💧

WPWS HOLDS GOLF OUTING

By Jeff Beiriger, WPWS Executive Director

On Tuesday, May 8, the Wisconsin Pump & Well Suppliers held their Spring Golf Outing at Trappers Turn in Wisconsin Dells, WI. The outing not only brought the industry together for a day of camaraderie, but also raised money for additional well projects. Funds from the outing have been used to build three water wells in Uganda and a location for a fourth is being discussed already. In all, nearly 50 golfers attended and, together with the event sponsors, raised more than \$2,000.00 for the well projects.

Sponsors of the event were:

Federated Insurance

First Supply

Franklin Electric

Headwater Wholesale

Marshall Well Drilling

Pentair

Preferred Pump & Equipment

Rep-Rite Burk and Associates

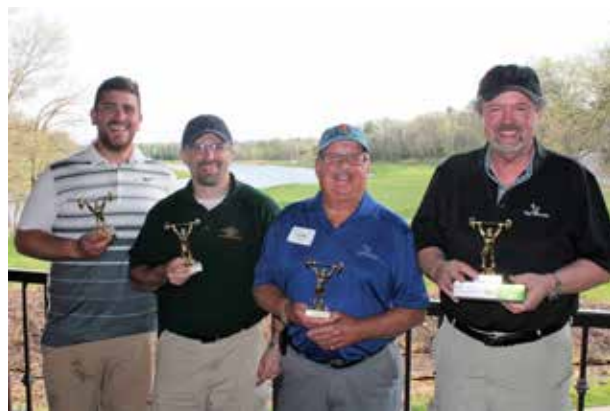
Rundle-Spence

Trappers Turn

Water Compliance Specialists

WPWS

**Wisconsin Water Well
Association** 💧



The winning foursome, pictured with their "I'm Pumped" trophies were (L to R) Karl Sprung, Aaron Gilson, Jeff Kuhn, and Jerry Ellis.

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INTRODUCING THE NEWEST MEMBERS OF THE DNR'S PRIVATE WATER SUPPLY FIELD STAFF

By Marty Newssman, Private Water Supply Field Supervisor, Wisconsin Department of Natural Resources



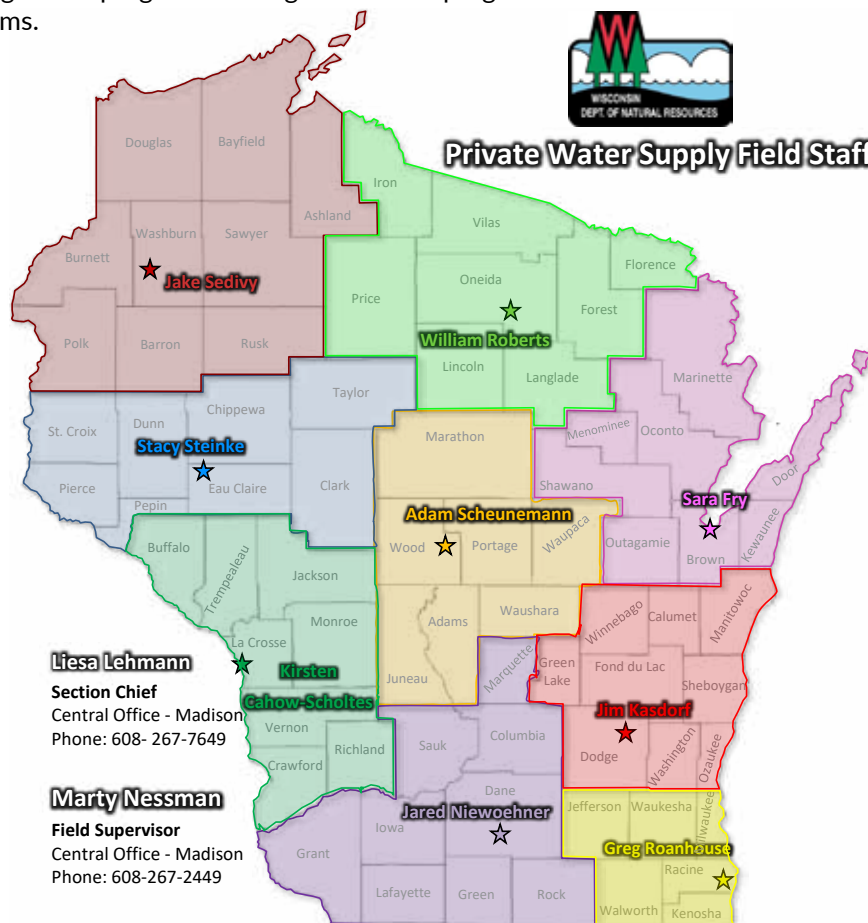
The Private Water Program has hired Adam Scheunemann as a Water Supply Specialist based in the Wisconsin Rapids office. His first day was on May 29, 2018. He has been assigned the counties that Steve Janowiak covered before he moved over to the Remediation and Redevelopment program of the DNR. Adam comes to

the Private Water Program from the CAFO program that permitted large animal production facilities. He has previous experience in the Drinking Water program working with public water supply systems.



The Private Water Program has also hired Sara Fry as a Water Supply Specialist based in the Green Bay office. Sara's first day was on June 10, 2018. She has been assigned the counties that JaNelle Merry covered before she was promoted to Field Supervisor in the Public Water program of the DNR.

Prior to joining the Private Water program, Sara worked with public water supply systems in the Drinking Water program. 💧



Private Water Supply Specialist (Office Location) Primary Phone #'s

Jake Sedivy	(Spoonerville)	cell: 715-416-3331	William Roberts	(Rhineland)	office: 715-365-8934 cell: 715-360-7297
Stacy Steinke	(Eau Claire)	cell: 715-225-2852	Greg Roanhouse	(Sturtevant)	office: 262-884-2356 cell: 920-387-7872
Adam Scheunemann	(Wisconsin Rapids)	cell: 715-299-0587	Jim Kasdorf	(Horicon)	office: 920-387-7872 cell: 715-579-9729
Kirsten Cahow-Scholtes	(La Crosse)	office: 608-785-9976 cell: 608-417-9570	Sara Fry	(Green Bay)	office: 920-662-5147 cell: 920-360-2688
Jared Niewoehner	(Fitchburg)	cell: 608-228-0309			



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SCHOLARSHIP APPLICATION

EDWIN HUNTOON SCHOLARSHIP

Edwin W. Huntoon (1917-2011)

Ed Huntoon served the WWWA as Editor of the newsletter, and was a proponent of the water well industry throughout the world. He started in the industry as a driller in the rock quarries, then for the US Army during WWII and on water supply projects around the world. Ed was a licensed pump installer, master plumber, and journeyman plumber. He was the recipient of the NGWA Life Member Award in 1991, and the NGWA Oliver Award in 1995 for outstanding contributions to the groundwater industry. He served as the Waupaca County Wellhead Protection Committee Chairman until his passing at the age of 93.



EDWIN HUNTOON ELIGIBILITY

- 2.6 grade point average or above
- Must be child or grandchild of a current WWWA member
- Must be applying to or enrolled in a post-secondary institute (college), as a full time student

OWEN WILLIAMS SCHOLARSHIP

Owen W. Williams (1922-2014)

Owen Williams served the WWWA as Executive Secretary, and represented the Association at many conferences, meetings, and legislative sessions. He served in the Navy aboard the USS Barb during World War II, and served as State President of the US Submarine Veterans. He devoted significant time and energy in the formation of the Wisconsin Water Well Guild, creation of continuing education classes, and promotion of Association membership. He encouraged others to "make greater strides to meet the challenge of protecting the environment."



OWEN WILLIAMS ELIGIBILITY

- 2.6 grade point average or above
- Must be child or grandchild of a current WWWA member
- Must be applying to or enrolled in a technical/trade/vocational institution, as a full time student

APPLICATION PROCEDURES

- Applications should be submitted to the Association by November 1. No exceptions.
- Applications should include written essay and two letters or recommendations.

APPLICATION SELECTION PROCESS

Personal information is removed from each application and is assigned a number. Applications are then sent to a review committee. The committee makes their choices based solely on the information provided by the applicant and the references submitted. The WWWA will notify the scholarship winners prior to January 1, 2019 by email.

Awards are presented at the Annual Wisconsin Ground Water Conference. Current college students will be presented the scholarship at the conference, while high school students will receive the scholarship after the completion of their first semester. Verification of current enrollment is required.

INSTRUCTIONS FOR COMPLETING SCHOLARSHIP APPLICATIONS

- Download the application or complete the form online at: wisconsinwaterwell.com
- Fill out the application, respond to both essay questions, and submit two letters of recommendation from persons who can attest to your character and assess academic ability
- Submit the form online or send to the WWWA office

MANUFACTURERS SPOTLIGHT

EPIROC USA

The WFWA sincerely appreciates the support of Epiroc USA – a bowling lane sponsor and speaker at the 2018 Wisconsin Groundwater Conference.

Epiroc is a new brand formed from Atlas Copco's Mining and Rock Excavation business area as a leading producer for the mining, infrastructure and natural resource industries. They use cutting-edge technology to develop innovative drilling, rock excavation and construction equipment while also providing world-class service and consumables. The new brand allows them to better serve their customers by building on the proven quality and expertise of Atlas Copco while narrowing their focus to provide more support and equipment that enhances productivity, energy efficiency, safety and ergonomics.

For more information: <http://www.epiroc.com>. ♦

Clark Herbst – Sales Representative, Midwestern Region

Epiroc USA LLC, Milwaukee, WI 414-760-1193



SUPPLIERS SPOTLIGHT

HOLE PRODUCTS

The WFWA sincerely appreciates the support of Hole Products as an exhibitor at the 2018 Wisconsin Groundwater Conference.

Hole Products has a long history of servicing the drilling industry. The company started in 2007 and has continued to grow and expand with 7 warehouse locations in the United States and a newly opened international warehouse in Canada. Through hundreds of years of combined work experience, their main focus has always been in servicing all drilling markets with the necessary products, knowledge, and solutions.

2018 has allowed Hole Products to expand into areas such as hammer breaking and rebuilding services, and they have the capabilities to break hammers up to 10". Their local



Wisconsin distribution center can accommodate almost any delivery with vehicles that utilize a piggyback forklift.

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For more information, log onto: www.holeproducts.com. ♦

THE BARABOO RANGES: PART THREE- DECIPHERING THE STRUCTURE OF THE BARABOO RANGES

By Tom Riewe

When geologists encounter highly tilted layers of bedrock, one of the first things they want to determine is the underlying structure of their beds. In order to accomplish this, they must first answer the question: *Which way is up?* That is, if the layers have a vertical orientation today, geologists must figure out which ones were originally on top and which ones were at the bottom. Often this is not obvious, especially with ancient, highly deformed bedrock sequences.

Geological beds are usually laid down horizontally, on the floor of an ocean or on top of an existing continental platform. Subsequently, over the course of millennia, they can be thrust upward or downward by powerful tectonic forces acting within the earth's crust. In some cases highly tilted beds are found so completely deformed that they are lying upside down with respect to their original position; and often there is no easy way to establish which ones were laid down first and which ones later.

During the periods of regional metamorphism that occurred in Wisconsin 1,630 and/or 1,450 million years ago, the quartzite beds of the north limb of the Baraboo Ranges got warped into vertical orientation. (Photo 1.) The geologists who first studied them in the late 1800's sought to decipher how these beds ended up so contorted.

Van Hise Rock - A Key to Understanding the Structural Configuration

On the western fringe of the north Range - nine miles west of the City of Baraboo, near the Village of Rock Springs - Van Hise Rock juts above the ground surface. (Photo 2.) It lies within Ableman's Gorge (aka The 'Upper Narrows') (Photo 3.). Here, through eons of time, the Baraboo River has cut a gap through the bedrock ridge. (Figure 1.) Van Hise Rock stands alone just outside the base of the nearby bluff of the vertical beds of the north limb and is composed of the same quartzite layers. (Photo 4.) & (Figure 2.)

So how and why did Van Hise Rock become significant? Although it has the same beds as the bluff in the nearby north limb, it was not obvious to early geologists whether it had, at one time, tumbled off the nearby bluff or was an erosional



Photo 1. The vertical beds of quartzite in the western bluff of Ableman's Gorge - within the north limb of the Baraboo Ranges.



Photo 3. Van Hise Rock. The author's hand is positioned at the juncture between the phyllitic quartzite beds and one of the pure quartzite beds. (Photo by Kyle Riewe)



Photo 2. Ableman's Gorge, where the Baraboo River has, over the millennia of time, cut a gap through the north limb of the Baraboo Ranges.



Photo 4. Van Hise Rock, as it appears from the western bluff of Ableman's Gorge. The eastern bluff of Ableman's Gorge can be seen in the background. Highway 136 is in the foreground.



Figure 1. Topographic map of the area just north of Rock Springs, Wisconsin; showing the location of Ableman's Gorge and Van Hise Rock. (United States Geological Survey)

The Baraboo Ranges continued on next page

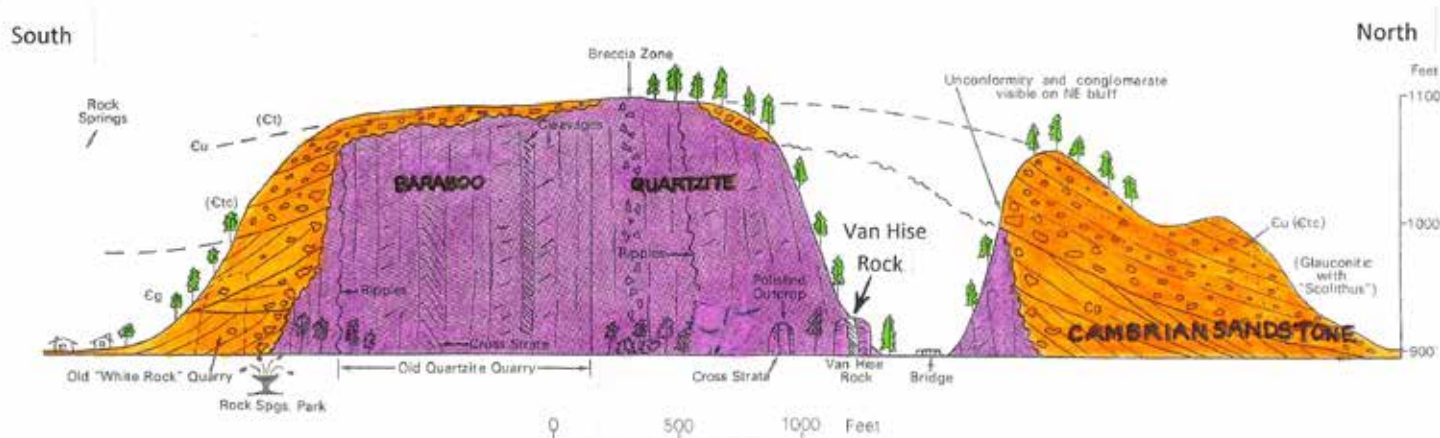


Figure 2. A north to south diagram of Ableman's Gorge (the 'Upper Narrows' of the Baraboo River). The Baraboo Quartzite of the north limb of the Baraboo Ranges is shown in purple. The younger Cambrian Sandstone, which was deposited unconformably^β on the quartzite, is shown in orange. Van Hise Rock lies within the river gorge. It is shown at the base of the north-facing cliff of quartzite.) ^β(The term 'unconformably' here indicates there was a very long time gap between the time when the quartzite was first exposed and the younger Cambrian Sandstone was subsequently deposited on top of it.) (After Dalziel and Dott, Wisconsin Geological & Natural History Survey, 1970)

remnant – still resting in its original position. In order to use this rock as evidence to help them understand the structure of these vertical beds they had to answer another essential question. Was Van Hise Rock *in situ*? That is, was it in its original position and place; or had it been transported from somewhere else?

In situ: a Latin term that means 'on site' or 'in position'.

The answer to this question – affirmative as it turns out – was one of the keys that allowed geologists to gain an understanding of the complex folded structure of the Baraboo Ranges. Van Hise rock helped geologists determine, for these quartzite beds, 'which way was up'.

Charles R. Van Hise, a 19th Century geologist (and a future President of the University of Wisconsin) carefully studied this rock – the rock which would later carry his name. He found a layer of dark shaley phyllitic quartzite** sandwiched between two solid layers of pure quartzite. (Figure 3.) After comparing the layers in Van Hise Rock to the layers in the cliff wall of the nearby bluff, he found that both had the same sequence of beds. And, more importantly, these beds had the same orientation and angles of inclination.

**The original bed of dark sandstone, before it was metamorphosed into this phyllitic quartzite layer, had a 'muddier' composition than the sandstone beds that became pure quartzite.

He thus came to the realization that this rock was not – as it first appeared – just a huge block of bedrock that had tumbled down off the nearby cliff wall. Van Hise Rock had been left in its original place and position and was just an outlying extension of the bluff.***

***Back then the cliff wall and the rock were closer together. In subsequent years, when the highway right-of-way was widened, the cliff wall was cut back to the west, away from the rock.

Once he recognized that Van Hise Rock was *in situ*, he realized that it could provide evidence to help explain how the beds of the north limb got thrust into vertical orientation. This realization also eventually

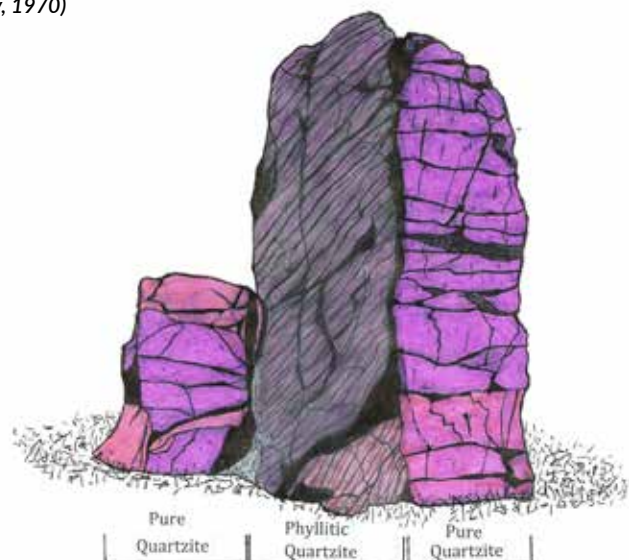


Figure 3. A diagram of the structure of the quartzite beds of Van Hise Rock. The unusual angle of the phyllitic quartzite beds sandwiched in the middle of the rock – between two beds of pure quartzite – offered evidence that the shaley phyllitic layers had been thrust upward into an orientation significantly beyond vertical.

helped succeeding geologists develop a more complete understanding of the structural configuration of the entire Baraboo Ranges. The explanation they worked out came down to a matter of angles.

The tectonic forces that thrust the pure quartzite beds of the north limb into vertical orientation also lifted the phyllitic quartzite layers along with them. This was a result of the earlier events of metamorphism when pressure applied to these formations slowly compressed both the quartzite and the phyllitic beds and, in this locale, bowed them upward. However, compared to the pure quartzite layers, the phyllitic quartzite layers ended up inclined at rather unusual angles.

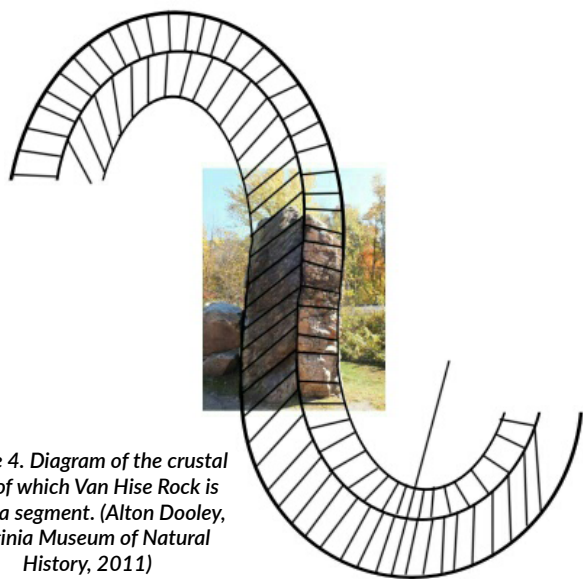


Figure 4. Diagram of the crustal fold of which Van Hise Rock is likely a segment. (Alton Dooley, Virginia Museum of Natural History, 2011)

As the phyllitic quartzite beds were being squeezed – being more soft and pliable – they got ‘smeared’ across the surfaces of the more solid quartzite beds. They slowly slipped past one another and ended up oriented at much different angles than the much harder and more rigid pure quartzite layers. Traces of this smearing and the angles of these phyllitic quartzite beds provided evidence regarding how the deformation occurred – and what implications this had.

Van Hise took note that, within Van Hise Rock, not only had the pure quartzite beds been thrust up on end – slightly beyond vertical – but that the phyllitic quartzite beds were turned even further. In fact they ended up lying almost completely upside down, at a reverse angle of 155 degrees to the horizontal. This made him realize that he could use these phyllitic layers, with their unique and uniform bed angles, as an evidence marker. So he decided to attempt to find outcrops exposed on other segments of the Baraboo Ranges.

He surmised that an examination of the orientation of the bedrock layers at other outcrop sites might help him come up with a method to determine the underlying structure of these ranges. If he could find bedrock outcrops exposed in the south limb of the ranges, he could compare the angle of the layers at those sites to the comparable layers exposed in Van Hise Rock. Then, by inference, he could compare the angles of the layers in the south limb to those in the north limb.

Later on he and his colleagues, including C. K. Leith, found bedrock layers exposed at other places on the south limb. At those sites they found the angle of both the pure quartzite and the phyllitic quartzite layers not only right side up but sloping at an angle of only 30 degrees off horizontal although the individual phyllitic beds – being shaley and thereby more ‘plastic’ – also got smeared here in the south range and ended up tilted to a more steep angle of 70 degrees. (Photo 5.)

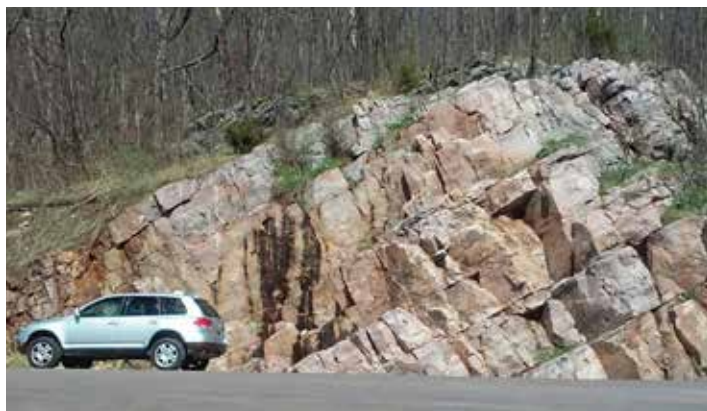


Photo 5. ‘Point of Rocks’ outcrop in the south limb of the Baraboo Ranges along former Highway 12, a mile south of the City of Baraboo. One of the phyllitic quartzite layers in the south limb of the Baraboo Ranges is just barely visible at the top of this outcrop. Both sets of these layers are inclined at an angle of 30° off horizontal but the individual shaley beds within the phyllitic layers ended up tilted at a greater angle of 70 degrees off horizontal.

They realized the significance of these widely differing angles of inclination of the quartzite layers in the south range as compared to those exposed within Van Hise Rock – and the north range. With this knowledge they were then able to envision possible configurations of the structure of these ranges.

A couple of decades later, using the discoveries of Van Hise and Leith, a geologist at the Wisconsin Geological and Natural History Survey – Samuel Weidman – studied the results of their work. He understood that when bedrock layers end up in vertical orientation, it is usually the result of compression folding within the earth’s crust.

Weidman compared the angles of the quartzite layers in Van Hise Rock to the angles of comparable layers found in outcrops in the south range. He came to the realization that the individual shaley beds of the phyllitic quartzite layers line up with – and are parallel to – the major axis line of the fold of the layers of bedrock (a concept later to be known as *Van Hise’s Rule*). As a result of this analysis Weidman was able to determine that the north and south ranges are two segments of a syncline, a structure like two ocean waves, with the trough between them.

Weidman’s insightful conclusion was based on the realization that Van Hise Rock was just a segment of a much larger fold in the Baraboo Quartzite – the top of which had been eroded away and the bottom of which remained as a buried extension, lying beneath the exposed portion of the rock. (Figure 4.) Once this became clear to him, in 1904, the overall structural configuration of the Baraboo Ranges fell logically into place. (Figure 5.)

Van Hise Rock had thereby been a key segment of evidence that allowed these early geologists to determine the structure of these complex and picaresque ridges.

To honor this significance, in 1997 the National Park Service designated Van Hise Rock a National Historic

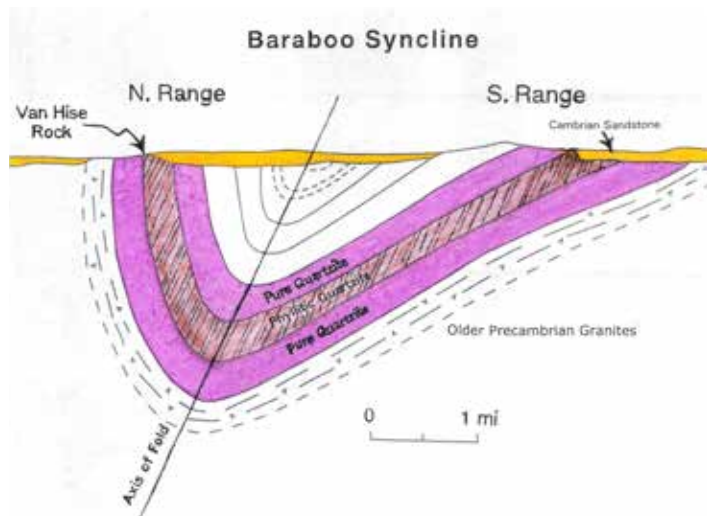


Figure 5. A cross-section of the Baraboo Syncline. Note how the individual beds of the phyllitic quartzite layer are aligned with - and parallel to - the major axis of the fold of the syncline. (After Zawacki, 2015)

Landmark, one of only twenty-four such sites in Wisconsin. Ableman's Gorge was also established as one of Wisconsin's 673 State Natural Areas by the Department of Natural Resources.

In subsequent years Van Hise, along with his mentor, Roland Irving, Weidman and others studied these types of bedrocks all over the world. These geologists came to be known as the "Wisconsin School of Precambrian Geology". After decades of study they were able to develop an understanding of how these bedrocks were originally created, subsequently metamorphosed and, in some locales, deformed into contorted configurations.

Next Article: How have geologists determined the age of the Baraboo Quartzite?

Much of the information in these articles is based on classroom and seminar presentations by the late Geoscience Professor Robert H. Dott, Jr. and by Emeritus Professor L. Gordon Medaris, Jr., both of the University of Wisconsin, Madison.

Also special thanks to Bruce A. Brown, Wisconsin Geological & Natural History Survey who reviewed these articles and provided many helpful suggestions; and to Phil Fauble, Hydrogeologist at Wisconsin's Department of Natural Resources, who provided much useful information regarding issues relating to the Baraboo Ranges. 💧

Tom Riewe is a retired DNR Hydrogeologist who spent his entire career in the Private Water Supply Section working with Wisconsin's Licensed Well Drillers and Pump Installers. A native of northeastern Wisconsin, he now spends his time dog-sitting, falling off bicycles and slipping & falling on hazardous hiking trails.

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June 12, 2018

MARKETING MATTERS: WHO DO YOU THINK YOU'RE TALKING TO?

by Tara Schessler, In Time Creative

Summer is a very busy time for the Water Well and Pump industry. Whether you are a supplier, service operation, installer or driller, you are likely working some pretty long hours right about now. So, if you don't have the energy or the time to read this article today, I encourage you to save it for later when you can put some thought into the following details about finding your most valuable prospective customer and/or client.

First, I'd like to point out that I truly don't make these ideas and concepts up. The findings I share with you are tried and true, derived from various trainings, books and seminars I engage in throughout my career as an Account Executive with WAOW TV 9 in Wausau. In this edition of Marketing Matters we will take a look at who your IDEAL prospect is. Answer these questions and find out how to make EVERY marketing effort you do speak to them directly. But first, let's talk about why this matters.

Before you write that print ad, design that billboard, produce that TV or radio spot you need to make sure you know who you're talking to. If you've read any of my previous articles, you may recall the importance of the female head of household. She is the one who makes the decisions about what to buy, who to call and when to schedule service for her household. This is a great start for the well drillers, pump installers and service business owners. However, what about suppliers? Who should you be targeting. Furthermore, just knowing how old and which gender your ideal prospect is really isn't enough. We need to dive deeper.

How it works.

Print out the below questions and schedule a meeting with all customer service and executive staff. Have everyone answer individually, or if you have a very large staff, break up into groups. Then as a large group share your answers. Put them up on a whiteboard, large paper on an easel or somewhere so all can see. Figure out who your IDEAL Prospect is.

Age:

Gender:

Relationship status (married, single, spouse's name):

Occupation (both individual and spouse if applicable):

Household Income (both individual and spouse if applicable):

Family (how many children, ages):

Goals, dreams, desires, wishes:

How do they like to be sold?

In person, through surveys, word of mouth, mail, do they like to read or do they like to engage in face to face conversation....

What pain are they in? What problem can you solve for them?

Name: Yes, give them a name!

**Exercise found in "Branding is OUT Results are IN!" By: Tom Ray, Executive Vice President of Jim Doyle & Associates, a marketing firm of speakers, authors, trainers and consultants.*

Example: I work with a wide variety of businesses and work for a news station. I've learned firsthand how the above exercise helps our newsroom decide on what to report each day. After going through the these questions, WAOW has decided that the ideal viewer is Lori Durawski. She is 42, has three children, is a Wausau resident, married to Tom who is 45, went to college at UW-Stevens Point, is a part-time teller at a bank, has a salary of \$20K, etc. I won't go on, but you get the point.

Recently, I had the pleasure of walking a Beauty School through this process. The staff and I had a great discussion of who their ideal prospective student was for recruitment. I won't go into details, but her name is Abbie.

The bottom-line is this, if your entire staff knows who your business is serving and why it MATTERS to them, the message should be the same and the leads will turn into happy customers with a higher retention rate. Consistency is always key.

Now, after you've completed this, write it up and give it to everyone in the office or shop. When you are about to decide on a marketing campaign, a sponsorship, a community involvement effort, you can decide, "Well does 'John' care?" and if someone in your company says "Who is John," well then they aren't paying attention and that's another matter all together. EVERYONE in your business should know who 'John' is, or whichever name you give your IDEAL prospect. When staff are engaging with customers, they should always keep this information in mind and ask themselves "am I solving their problem?"

This exercise is meant to guide your marketing efforts to gain you the most positive results. If you are answering your



*Marketing Matters continued
on next page*

most prospective client/customer's questions before they even ask them, don't you think it puts you one, two or 10 steps ahead of your competition? It's also designed to create a stellar customer service level companywide.

Thank you again for your time and interest in the Marketing Matters articles. For my next entry we will talk about the website statistics and results from the 2018

Wisconsin Water Well Association ad campaign, and if there's room, I'll sneak in some snippets about beating the competition with powerful messaging that will position you as a leader in your field. 💧

Sincerely,
Tara Schessler

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Central Well Drlg & Pump
Service Inc.
Brandon, WI

Allen Smith
Bloyer Well & Pump, Inc.
Rockford, IL

Christopher Smith
Bloyer Well & Pump, Inc.
South Beloit, IL

Jeffrey Solofra
JS Services
Burlington, WI

Steven Solofra
Solofra Plumbing
Burlington, WI

Randy Soper
Mike's Plbg, Htg &
Elec Inc.
Pulcifer, WI

Timmy Soper
Gillett, WI

Jeffrey Speth
Judd Pumps &
Plumbing LLC
Montfort, WI

Eric Stahl
Grundfos
Rochester, MN

Brian Stangret
Midwest
Elevator & Drilling
Waconia, MN

Michael Steffi
Steffi Drilling & Pump Inc.
Willmar, MN

Todd Sticha
NDS Drilling Supply
Company Inc.
Elko New Market, MN

Steven Styczynski
Kramer Well Service Inc.
Weyerhaeuser, WI

William Suckow
Suckow Well Drilling
Menomonie, WI

Kenneth Sweeney
Ken Sweeney Well
Drilling & Pumps
Franklin, WI

Steven Tesmer
Eckmayer Inc.
Waterloo, WI

Jeffrey Thron
Mantyla Well Drilling, Inc.
Lakeland, MN

Richard Thron
Mantyla Well Drilling, Inc.
Lakeland, MN

John Treutel
Stratford Plumbing &
Heating
Straford, WI

Jim Valentine
Rep Rite Burk
Hilbert, WI

Thomas Van De Hei
Water Right/Clean Water
Testing, LLC
Appleton, WI

Eric Van De Yacht
Leo Van De Pump
Installing
Green Bay, WI

Tom Van De Yacht
Ground Source Inc.
De Pere, WI

Troy Van De Yacht
Leo Van De Yacht
Well Drilling
Green Bay, WI

Ralph Volkman
Ralph's Water
Conditioning LLC
Black Creek, WI

Brian Vukodinovich
Aqua Well & Pump
Systems Inc
North Prairie, WI

Trisha Vukodinovich
Aqua Well & Pump
Systems Inc
North Prairie, WI

Vern Wagner
Wagner Plumbing
Wautoma, WI

Bruce Walker
Wisconsin Well & Water
Systems LLC
Grand Marsh, WI

Bradley Webster
Brad Webster &
Sons Drilling Inc.
Poynette, WI

Alan Wepking
Wepking Pump Service
Lancaster, WI

David Werner
Werner Pump Service
Jefferson, WI

Jerome Wojkiewicz
Aqua Service
Rice Lake, WI

David Woyak
4-D Water Well And Pump
Service LLC
Hartland, WI

Lloyd Wurzer
Cahoy Pump Service
Sumner, IA

Raymond Young Jr.
Chicken Young's
Well Drilling
Gillett, WI

THE NGWA FOUNDATION AND THE GROUNDWATER FOUNDATION TO MERGE, CREATING SOLE ORGANIZATION FOCUSED ON ADVANCING GROUNDWATER KNOWLEDGE THROUGH EDUCATION, COMMUNITY OUTREACH, AND PROFESSIONAL DEVELOPMENT

Merger Aligns Key Organizations to Effectively Raise the National Profile of the Groundwater Industry

Existing Staff and Operations for the Groundwater Foundation to Remain Intact

(WESTERVILLE, OH – May 29 , 2018) – The National Ground Water Association's (NGWA) Foundation for Groundwater and the Groundwater Foundation today announced the organizations will enter into a merger, establishing the foremost Foundation dedicated to protecting groundwater and enhancing professional practices in the industry. Under the agreement, the combined entity will carry the Groundwater Foundation name and will leverage administrative and operational support from NGWA.

Background

Established in 1994, the NGWA Foundation is an IRS-approved public charity that is focused on conducting educational initiatives, research, and other charitable activities to broaden public understanding of groundwater. The NGWA Foundation is operated by the National Ground Water Association.

Similar to the NGWA Foundation, The Groundwater Foundation is a not-for-profit group that connects people, businesses, and communities through grassroots education and action. Established in 1985, the Foundation provides motivational and inspirational education and community-based action programs that involve individuals, communities, public and private entities in groundwater conservation and protection.

Established in 1948, NGWA is a community of groundwater professionals advocating for the responsible development, management, and use of water. The Association's members include leading public and private sector groundwater scientists, engineers, water well system professionals, contractors, manufacturers, and suppliers of groundwater-related products and services. The group, headquartered in Westerville, Ohio, is the "go-to" source on significant and timely issues impacting groundwater and champions for the public's access to safe, sustainable water.

Merger Creates Groundwater "Community"

The organizations believe this merger is important as it creates a hub of information and charitable outreach for

groundwater professionals and the public alike. Folks in the industry will have a strengthened resource for education, networking, and professional development. The public will have access to the latest science, research, field work, scholarships, breaking news, and comment from proven leaders in the groundwater industry.

"Since 1994, the NGWA Foundation has established numerous programs to assist those working with, and those that need groundwater. This merger aligns our Foundation with an organization that shares our passion, extends our combined vision, and bolsters our grassroots efforts to educate, inspire action, and to create a community of Groundwater Guardians to protect this critical resource," said Terry Morse, CEO of NGWA.

Jane Griffin, executive director of the Groundwater Foundation, says the merger will provide a robust platform to effectively deliver various community programs and initiatives.

"NGWA and the Groundwater Foundation have been partners for several years and we have complementary strengths, experiences, and industry knowledge.

While the Groundwater Foundation has a national presence, our mission is to boost groundwater awareness at the local level, and merging with NGWA's Foundation allows us to extend this mission, address issues, and educate at every level," said Ms. Griffin.

Details

The Groundwater Foundation will remain in Lincoln, Nebraska, and staff will be retained. The group will be supported by NGWA. As Foundation executive director, Mrs. Griffin will report to NGWA CEO Morse. NGWA staff and operations will remain unchanged.

"One of our key messages to our diverse membership is that we truly are 'better together' in our collective efforts to advance the groundwater industry. We're excited to merge with a fantastic organization that allows us to expand this message to its members, to individuals, and to local communities alike," said Mr. Morse.

For more information on the merger, please visit www.ngwa.org.



*Providing & Protecting
Wisconsin's Groundwater*

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WWWA CALENDAR OF EVENTS

SEPTEMBER 4, 2018

**Tanzania: The Challenge of Developing Water
Well Sources Supplies
(NGWA Webinar)
3-3:30pm ET**

OCTOBER 2-3, 2018

**Groundwater and Agriculture: Meeting the
Demands While Protecting Resources
(NGWA workshop #172)
Cedar Rapids, Iowa**

OCTOBER 25, 2018

**Minocqua Continuing Education
The Waters of Minocqua
8116 Hwy 51 South
Minocqua, WI 54548**



DECEMBER 3-6, 2018

**2018 NGWA
Groundwater Week
Las Vegas, Nevada**

JANUARY 9-11, 2019

**2019 Wisconsin Groundwater Conference
Kalahari Resorts & Conventions
Wisconsin Dells, WI**

MAY 14, 2019

**WPWS Spring Golf Outing
Trapper's Turn Golf Club
Wisconsin Dells, WI**