Thanks to Essential Workers

Proposed Lead & Copper Rule Revisions

Pond Odds and Ends

Operation During Challenging Times

Pump Curves: What do they mean?

Where are we in the State of Wisconsin?
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OFFICIAL PUBLICATION OF THE WISCONSIN RURAL WATER ASSOCIATION

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Wisconsin Rural Water Journal is the official publication of the Wisconsin Rural Water Association,  
published quarterly by the WRWA, 350 Water Way, Plover, WI 54467. Non-profit third class bulk mailing  
permit paid at Plover, WI. Copyright 2020. All rights reserved.

Contributions from operators, managers, clerks or industry are encouraged and welcome. Editorial content reflect  
the views of the authors and do not necessarily represent the views of the Wisconsin Rural Water Association.

Address all letters to the editor, advertising inquiries and correspondence to: Wisconsin Rural Water Association, 350 Water Way, Plover WI 54467.
Summer and all its hot days are finally here and I hope everything is going well for everyone. Hopefully you are all staying safe in the field and around any roadwork or construction projects you may have going on. Remember to stay away from the COVID-19 bug and continue staying distanced and sanitized.

Speaking of COVID-19, thanks to all the operators who have kept up their duties during this problem and also to the operators who were willing to help out area communities if there was a problem.

After canceling conference last Spring, the board had to sit down and discuss the Operator's Expo at our last board meeting. After much discussion we felt that the safety of everyone could not be guaranteed, so we decided to cancel the event. Chris and the staff are looking into ways of putting classes on-line and including vendors with some product demonstrations. This “Virtual Expo” should be fun and a good chance to earn some CEUs.

Finally, our staff have been available for emergencies throughout this pandemic and they have done a great job delivering maintenance equipment and going through emergency response plans with operators across the state. I’d like to thank them for their continued hard work.

Please have a safe and wonderful Wisconsin Summer! Ramon

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Congratulations
Glen McCarty
Operator of the year
District 3

WRWA Mission:
Assisting, educating and representing our members in the Water & Wastewater Industries.
Well, where did spring go? It past right by my window as I sat in quarantine. WRWA staff spent the entire spring inside safely working remotely with operators around the state. We, as well as you, were deemed to be essential employees and had the chance to continue bringing technical assistance and training to you. We had to work a few things out to do so; had anyone heard of ZOOM before this crisis hit us? Wish my stock market outfit would have heard of it, I could retire early! I would really like to thank everyone that worked with WRWA and attended our training over the past few months. It helps us to maintain our contracts with National Rural Water and USDA Rural Development. We are still working on training for water operators. Our water training has fees attached to it and we are looking to get together an excellent set of classes that we feel good about charging for. Stay tuned and we will have things going quickly.

Our normal face to face training is an ongoing wait to see where we can hold classes and if municipalities want to welcome operators from outside of town. This is a concern especially after isolating for so long. It would be extremely difficult to be the vector for a COVID transmission or be the cause of others getting sick. The thing we worry about is spreading this disease through the water/wastewater industry and causing an interruption in services. We have strived for over 30 years to prevent this from happening and do not want to be the cause of an outbreak. This was the biggest reason for canceling both the Conference and the Operator Expo.

And as a reminder, you need to keep up all the routines that you have been practicing since early March. Frequent hand washing, use of gloves, wearing a mask, distancing from your colleagues and customers, using sanitizer on your hands, disinfecting frequently touched surfaces and staying home when you are not at work. If you have not gotten sick yet, then you are doing a great job, just continue to do it. This is a lot to ask since everyone is in a rush to get out and enjoy summer with friends, neighbors…and thousands of people from out of your region or state! It just has to be this way until there is a vaccine.

Until then, life goes on. There are a few things coming down the pipe that we will be keeping track of. PFAS has not gone away, phosphorus is still a problem in this state, water disconnections have to be sorted out and fees paid and the Governor has created a means for all villages, towns, cities and counties to get some reimbursement for COVID expenses. Keep in touch and we’ll get through this. Chris

A Time of Reflection

Chris Groh,
WRWA Executive Director

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Thank you to the entire WRWA staff for their continued efforts on behalf of all Utility workers in the state, not only during this unprecedented trying time, but always. It is much needed and is more appreciated than you could know. Stay safe!

Respectfully,
Ruth Mueller, Utility Director, West Bend Water & Sewer Utility

Hi Kay,
I cannot thank you and your team enough for putting these workshops on via zoom. The information is great, I love the convenience of not having to leave the plant, and your timing is perfect as things have slowed down enough with the pandemic that I am able to learn and earn my CEUs.

Thanks again for your hard work and all that you guys do!
Jen Marzu, EHS Manager, LignoTech USA, Inc.

Todd,
Just a note of Thanks for always helping us out. It makes our job (when we have a main break) so much easier & efficient when we can count on you to give us a speedy response.
It would be difficult to do what we have to do without your help.
Thank you,
Jill Bahu, Village President, Village of Hawkins

Jeff,
I wanted to Thank You so much for locating our water main break. Without you we would have had to break up a much larger area of new pavement we had put in last year in order to find our leak. We feel more educated on the services you provide and safer knowing to stay off of it as much as possible.
You are very educated, personable and responsive to our needs. I again want you to know how much we appreciate everything you did for us on 6/16/20.
Thank You,
Judy Denzer, Lockmaster, Lock and Dam No. 4

Hello Chris,
I wanted to thank all of you at WRWA for being there for us operators, and to thank Jeff LaBelle in particular for helping me when our water tower froze and for finding leaks in our water system. He is a pleasure to work with and is always willing to help any way he can.
Village of Radisson Public Works

Good Morning Mr. Chris:
Just wanted to send you a note to say thanks for your leadership and support over the years as I make my exit June 30. I leave with total confidence in Matt and the staff he has put into place. The future is bright and the challenges and obstacles which are sure to come, will be overcome with leaders like yourself.

As you may already know and starting July 1, I will be working with Napoli Shkolnik Law firm to support the NRWA PFAS class action lawsuit. My job will be to identify and facilitate communication with utilities who have been impacted or have the potential to be impacted by PFAS compounds. There is no cost to the utility and the lawsuit is not against local companies who may have used the compound, it is against the manufactures. In fact, those local companies can join the lawsuit. There is no cost and when a settlement is reached, the utility has the choice of accepting or rejecting the settlement. Everything to win and nothing to lose, but they must be registered to receive the settlement. If you know of any systems, I would appreciate an introduction.

If I can support the association or any system as it relates to PFAS, please reach out. It has indeed been a pleasure to work with you over the years and I hope to see you around the bend.
Stay safe.
Sincerely,
Sam Wade, National Rural Water Association

We get letters and emails!
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- Tank Structural Repair Specifications
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Ponds and Lagoons are a commonly constructed for treating wastewater in smaller communities. Although it may seem that little needs to be done for a pond to function properly, regular maintenance and planning will improve the overall operation of a pond. Some considerations for proper pond operations include aeration, weed and critter control, and sludge depth. Some long-term options for pond operations include meeting limits that may decrease in the future and when to de-sludge your pond.

Ponds were developed as a cost effective way to treat wastewater in smaller communities and sanitary districts. Ponds come in many different shapes and sizes, as well as, in many different configurations. Some ponds have blower aeration while others are so far from town that there is no cost effective way to get electricity to the pond. If electricity is an issue some things that can be tried are buying solar powered aerators or putting a windmill in the pond to help introduce air. Aeration is a valuable process to add to wastewater because it gives bacteria oxygen and also helps mix the wastewater. Air is important, if you have aerators, make sure they are functioning properly. If your pond does not have aeration working to introduce air to your pond may pay dividends.

A common problem with ponds is weed and critter control. If you operate a pond, it is good practice to stay on top of weed control both around and inside the pond. Mowing around the pond and spraying weeds is important for maintaining a pond. If weeds on the bank of a pond are allowed to grow unencumbered, roots may damage the liner of your pond. Weeds within your pond like duckweed are more of an issue for process. In some cases having a little weed cover can help. It is useful to remove duckweed so it doesn’t take over your pond. Some people rake it off and others have made devices to float a trash pump around so you can suck the duckweed off the pond. Critter control is something that will be easier the cleaner you keep your pond. If you have critters around your pond make sure you consult your DNR rep to determine the proper way to move or eliminate animals. Animals like beavers, turtles and otters can burrow in and damage your pond liner.

Along with everyday maintenance an operator of a pond or lagoon should always be planning for when a pond needs the sludge removed. A couple of other long-term planning items would be having an idea of what your future permit may include and considering if your pond will need upgrades and additions.

Jesse Hass,
WRWA Wastewater Technician/Trainer
Wastewater Specialist
An operator should check sludge depths often to know how their pond is functioning. If your pond has too much sludge it will become more difficult to meet limits. Ponds all operate differently so it may be anywhere from 15 to 30 years before you need to take out sludge. If you are a new operator knowing when your pond was de-sludged is an important piece of information to have.

A couple of other long-term planning items would be having an idea of what your future permit may include and considering if your pond will need upgrades and additions. Ponds discharge in a variety of ways. Some discharge continuously while others only discharge for part of the year. Some ponds discharge so receiving waters while others drain into seepage cells or spray their effluent for irrigation. Ponds that discharge to receiving waters may already have phosphorus limits or may receive limits for phosphorus in the future. Ponds that discharge to groundwater will have nitrogen limits. To meet more stringent limits a pond may need to feed chemical, add new cells, add covers, install curtains, add tanks or other technology and upgrades may be needed. Knowing your pond and how it operates will help you decide the best strategy for optimizing how your pond runs.

Ponds are a popular way for communities to treat wastewater. Some ponds were built years ago and are nearing the time when upgrades need to be considered. Be diligent and try to educate yourself on your future limits. Having a strategy in place to meet lower limits will be vital for remaining compliant. Along with future planning, make sure to do regular maintenance to extend the lifespan of your pond. Lastly, having a sound preventative maintenance schedule is important for cost savings a proper functioning pond.

Jesse
Thanks to Essential Workers

By Annetta Von Rueden

I just wanted to send out a HUGE shout out and THANK YOU to all of the essential workers who have gotten all of us through this unexpected time. The Pandemic. Police, fire fighters, doctors, nurses, nursing home workers, grocery, retail store employees, and gas station attendants. Post office workers and all couriers, shipping who have this country moving. You are all admired for your courage, strength, and bravery.

There is another group of unmentioned, essential workers that are just as critical. You all know who you are. The undermentioned, and unspoken Superhero’s who are on the front lines everyday 24 hours a day, 365 days, year after year delivering clean, safe drinking water to every home and business in every community in the state and in our nation.

Safe drinking water is taken for granted. Water is essential to life; we all need it to survive. It happens because a highly dedicated group of professionals who take pride in their jobs, performing all sorts of tasks, operations, maintenance, lab, and paperwork. Not to mention keeping compliance with DNR and EPA rules and regulations. It takes skill, great knowledge and dedication. Each and every day the water utility is ran like a well-oiled machine thanks to you all. Without you these water and wastewater systems wouldn’t be where they are today. Wherever you travel in the state all of the operators are great people.

There is a subset of our heroic operators in this state. A very special thank you to the 60 or so operators that have volunteered to go to other systems that may be undergoing a COVID incident. These operators have shown to be especially brave in helping other systems provide safe water and clean wastewater throughout the state.

You are the true Superhero’s, the backbone, and what makes the water industry superior above all else. **THANKS FOR ALL YOU DO!**

Stay safe and see you on the road. Annie
Hello Everyone,

Well it has been a long and strange few months for us at Wisconsin Rural Water Association. I’m glad to announce that we are back on the road and providing technical assistance to all your small water system needs. Please feel free to contact me if you are in need of the following services:

- Leak detection and repair
- WI DNR paperwork
- Water Sampling Assistance
- Lead + Copper (WQP)
- Operator Certification
- Distribution System Inspections
- Operation and Maintenance

These are just a few services we can provide to your Small water systems. Please don't hesitate to call if your water system is having any kind of technical assistance issues. We are more than happy to help and keep your system in compliance.

Thank you, and have a wonderful day!

George Taylor
Small Water System Circuit Rider
715-321-4145
gtaylor@wrwa.org
During our virtual National Rural Water Association in-service we needed to sit through many webinars. As expected, some webinars were pretty painful to listen to, while others really caught my attention. Lead and Copper has been a hot topic since at least 2014. Now the EPA has finally proposed its revisions to the infamous Lead and Copper Rule. This is the first major revision since 1991.

There are numerous proposals to this rule. Mostly these changes focus on lead in household water lines. I will hit on a few highlights of the revisions since all of the revisions would take up this whole magazine. The proposal continues to maintain the “action level” for lead at 15 ppb, but also includes many changes that may impact water systems throughout the state.

“TRIGGER LEVEL”

As stated earlier, the “action level” remains at 15 ppb. EPA added a “trigger level” of 10 ppb. The “trigger level” is not a health-based standard. At this “trigger level,” systems that currently treat for corrosion would reevaluate their treatment system, while systems that do not currently treat for corrosion would need to conduct a corrosion control study. This proposal also requires an outreach program to customers with Lead Service Lines (LSL).

Corrosion control treatment (CCT) will be based on the 90th percentile of the “trigger level” (10 ppb). If you exceed the “action level,” your reevaluated/re-optimized CCT will need to be proposed to the state and implemented.

If two annual sampling periods have no “trigger level” exceedances, systems may drop back to reduced monitoring. If later, an “action level” is exceeded, systems must implement CCT.

Under this revision, the use of Calcium Carbonate Stabilization will need to be removed as EPA feels that the use of this treatment proves to have inconsistent results. EPA recommends orthophosphate as the main CCT to be utilized.

LEAD SERVICE LINE INVENTORY (LSL)

This revision is also requiring all water systems to inventory their Lead Service Lines (LSL). This inventory will be made public and will need to be submitted to the state 3 years after the rule promulgation. Galvanized pipe will be treated as lead pipe as original coatings of galvanized pipe may contain lead. This inventory will need to be updated annually and submitted to the state. The state will then submit to the EPA.

LEAD SERVICE LINE REPLACEMENT (LSLR)

All water systems need to submit a LSLR plan which is due 3 years after promulgation of the rule. LSLR goals for exceeding the “trigger level” need to be agreed upon with the state. There is a mandatory LSLR for systems exceeding the “action level.” There is no longer partial LSL replacement. As EPA feels that partial replacement will disturb the existing LSL and cause a bigger issue.

DISTURBANCE REQUIREMENTS

These are requirements in the revision where you work with the home owners to maintain safe water after a minor or major disturbance.

A minor disturbance would be considered a temporary shut off of water. If this happens, you are to provide to the home owner flushing procedures so they may clean their water lines.

A major disturbance would be a replacement of a meter, pigtail, gooseneck, or a break in the line. If any of these happen, you will need to provide take a PBCU sample at the location and get results to the customer.
within 30 days. Also, you will need to provide to the customer pitcher filters and 3 months of cartridge filters. The EPA finds that disturbances can last up through 3 months.

**NEW TIERS**

With the new revision the EPA has eliminated any dates in the tier classification. They are as follows:

- **Tier 1**: Single family residence with lead service lines
- **Tier 2**: Multi-family residence with lead service lines
- **Tier 3**: Single family residence with copper pipe and lead solder
- **Tier 4**: Representative sample (residence contains no lead)

**MONITORING REQUIREMENTS**

The revision is requiring systems to collect as many samples from Tier 1 as possible, then Tier 2, then Tier 3, then Tier 4. “Trigger level” exceeders must sample annually for 3 years under 10ug/L at the standard number of sites before qualifying for reduced monitoring. “Action level” exceeders must sample annually for 2 years of 6 month samples (4 sampling events), and 1 annual at the standard number of sites before qualifying for reduced monitoring.

**SAMPLING AT SCHOOLS & CHILD-CARE FACILITIES**

The revision requires lead sampling at schools and child-care facilities on a regular basis. The system must develop a list of all schools and child-care facilities within the water system and update this list every 5 years. Systems must provide public education to the schools and child-care facilities, sample for lead every 5 years (Five 250 ml samples at each school; two 250 ml samples at child-care facilities), then share the results with the facility, health officials and the state within 30 days. System will document if any facility refuses to take samples since the system cannot require the facility to do so. The sample results are not included in the 90th percentile.

**FIND AND FIX**

Find and Fix has been added to the revision as a follow-up to any single tap that exceeds the 15 ppb “action level.” A follow-up sample must be taken after 30 days. The results of this sample are not included in the 90th percentile. Systems must provide results to the customer within 30 days after receipt. The system will collect water quality parameters (WQP) at that home and other homes with similar or smaller pipe size within ½ mile. The plumbing needs to be similar to the home that had the exceedance. The system must determine if CCT is causing the problem or an adjustment of that treatment may be able to fix the problem. The system must submit mitigation to the solution to the state for approval within 6 months. (The state then has 6 months to approve the plan)

There are more revisions to the rule affecting reporting, CCR language, public education, alternatives for small systems, and primacy requirements. This revision is to come to fruition in late 2020. To see all of the revisions, go to EPA’s web site and search for the Lead and Copper Revisions. I hope this did not confuse you too much.

Stay healthy.

https://www.epa.gov/sdwa/lead-and-copper-rule-long-term-revisions
### PSC WATER RATE INCREASE ORDERS ISSUED
**MARCH 1, 2020 – MAY 31, 2020**

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<th>ORDER ISSUED</th>
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<td>Cross Plains Water Utility</td>
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<td>43.98%</td>
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<tr>
<td>Loganville Municipal Water and Sewer Utility</td>
<td>03/10/20</td>
<td>27.08%</td>
</tr>
<tr>
<td>Tomahawk Municipal Water and Sewer Utility</td>
<td>03/13/20</td>
<td>47.01%</td>
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<tr>
<td>Green Bay Water Utility</td>
<td>04/01/20</td>
<td>4.36%</td>
</tr>
<tr>
<td>Lake Mills Light and Water Department</td>
<td>04/07/20</td>
<td>16.91%</td>
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<tr>
<td>Wausau Water Utility</td>
<td>05/19/20</td>
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### PSC CONSTRUCTION AUTHORIZATIONS ISSUED
**MARCH 1, 2020 – MAY 31, 2020**

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<tr>
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<td>Potosi Municipal Water Utility</td>
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<td>Woodville Water and Sewer Utility</td>
<td>04/27/20</td>
<td>$1,800,750</td>
</tr>
</tbody>
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MEMBERSHIP & AD RATES

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Septage Haulers/Plumbing Co. $150
Less than 1,000 people served $315
1,001 – 2,500 $390
2,501 – 6,000 $455
6,001 – 10,000 $520
Over 10,000 $585
Associate $520
Corporate $1,465
Corporate Gold $2,750

JOURNAL ADVERTISING RATES

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<th>NON-MEMBER 1-Time</th>
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For information on advertising & the benefits of membership at the different levels, please contact Renee at the WRWA office: 715-344-7778 or rkoback@wrwa.org. *Must be employed by a WRWA system, associate, or corporate member, retired and state or federal employees.
First of all, I want to tell you how that I am so proud of all of you wastewater operators. During this pandemic, you’ve gone to work every day, doing what it takes to meet you permit limits and keep Wisconsin’s lakes and streams clean. You are the Essential Workers that few of us appreciate or talk about. Thank you for your dedication.

It’s difficult, if not impossible, to be “socially distant” working as a wastewater or collection system operator. There are times when a pump fails, a sewer plugs, heavy equipment needs work, etc. that call for more than one person to work closely together. Since February, I’ve received many inquiries as to the possibility of acquiring COVID-19 from wastewater. Finding good information has been like talking to me when I first wake up in the morning; you never quite get any worthwhile information. There are lots of “Be Careful!” quotes out there. In doing research on COVID-19, I realized that very little is really known about the virus. Most of the information is comparing it to the SARS outbreak in China a few years ago, since the viruses are somewhat similar. I started a Facebook Group Page “Essential Workers Water and Wastewater Operators” to post information from reliable sources on pandemic issues in the wastewater treatment field. Many operators sent helpful information and sources of help. National Rural Water, Water Environment Federation, TPO magazine, and others have placed information online.

The CDC website states “Recently, the virus that causes COVID-19 has been found in untreated wastewater. While data are limited, there is no information to date that anyone has become sick with COVID-19 because of exposure to wastewater. Standard practices associated with wastewater treatment plant operations should be sufficient to protect wastewater workers from the virus that causes COVID-19. These standard practices can include engineering and administrative controls, hygiene precautions, specific safe work practices, and personal protective equipment (PPE) normally required when handling untreated wastewater. No additional COVID-19–specific protections are recommended for workers involved in wastewater management, including those at wastewater treatment facilities.”

What I have found is that the virus is found in fecal matter. The virus is 80 to 120 nanometers in size. A human hair is 60-120 µm. One nanometer equals 1000 µm. So… you get the picture; you’re dealing with something pretty small here.

Studies are being done in cities like Madison on comparing the density of the virus in wastewater compared to the number of positive COVID-19 cases in the corresponding cities. According to the University of Minnesota it can be found in aerosols, so you folks with DAFS or aeration, especially in enclosed rooms, need to be careful. The
dilution factor is to our advantage at wastewater treatment plants, although collection system operators may want to make sure they are using PPE.

During the SARS epidemic, the virus had supposedly spread through plumbing, so working on laterals from a building with COVID-19 patients may increase risk. The virus can survive both cold and warm water. It can be viable in water for several days depending on various factors according to the CDC. There have been reported cases of wastewater operators being infected across the U.S. and in Wisconsin, although the sources of infection are not all known and are probably community spread. You probably have a better chance of catching it from a salesperson without a mask or a toddler (the human petri dish) than you have from wastewater. According to studies, wastewater operators do develop immunities against some things over time. However, this is a new virus, and they are still learning about it as you can probably assert from the news.

I’ve been dealing with some very small systems that have no PPE for their workers. Remind your employers that providing PPE is the law – both state and federal. It’s up to you to use it.

So, my scholarly advice to you? Be careful!
As you know, we all test for this. The DNR usually requires the operator to test every three years. Some municipalities may have to test more often due to having a contaminate issue. Some of us may wonder what are VOC’s and why do we test for them. As an operator, it’s your responsibility to not only sample correctly, but also to ensure the removal of the contaminate. I will give a brief overview of VOC’s and how they can be removed.

WHAT IS A VOLATILE ORGANIC COMPOUND (VOC)?
VOC’s are composed of two categories; Synthetic and Organic. Volatile organic compounds (VOC) are chemical solvents or cleaners (and their byproducts) that are derived from petroleum products or contain carbon. They are volatile because they evaporate into air relatively easily. They are man-made contaminants that arise from industrial processes. A synthetic substance or compound (SOC) refers to a substance that is man-made by synthesis, rather than being produced by nature. It also refers to a substance or compound formed under human control by any chemical reaction, either by chemical synthesis or by biosynthesis. Some examples of synthetic are herbicides, pesticides, paints, and dyes.

There are many different organic and synthetic compounds; the most commonly found in our drinking water comes from the run off of pesticides, herbicides and industrial spills. The run off and spills, if not properly cleaned up, slowly seeps through the ground and contaminates the ground water source. VOCs are known to cause cancer and may cause vital organ damage.

There are 4 basic methods for removing VOC’s. They are air stripping (forcing the VOC to evaporate), granular activated carbon, advanced oxidation process and reverse osmosis ultrafiltration. EPA has approved packed tower aeration for the removal of all regulated VOC’s and granulated activated carbon for all VOC’s except vinyl chloride.

Air stripping is probably the most common and the most economical to run. Air stripping consists of water falling through a tower filled with some type of plastic or ceramic media. As the water falls, a blower forces air up into the falling water. The air makes contact and strips the VOC’s out of the water. A well-maintained air stripper will work very efficiently and have many years of service life.

The second most common method of removal of VOC’s is Granular Activated Carbon (GAC). Water flows through the media and the VOC’s are absorbed. GAC filters require the operator to remove and dispose of the media or regenerate. A caution with GAC is it can remove radon. Radon builds up on the media which can lead to a radiation source.

The other two methods of removal of VOC’s are Reverse Osmosis and Advanced Oxidation. Reverse Osmosis uses a very fine membrane in which water is forced through to remove the contaminates. Advance Oxidation is a chemical treatment process to remove VOC’s.

It is important to understand VOC’s and the processes in which to remove them. If you have any questions on the testing process or the removal of VOC’s, please contact your Wisconsin Rural Water Circuit Rider for more information. See Ya Soon Todd Weich, WRWA Water Circuit Rider
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Centrifugal pumps come in a variety of shapes and sizes, and each pump comes with its own specific curve. Curves are also specific for the nominal RPM (revolutions per minute) as indicated on pump name plates – the pump curve shown here is for 1750 RPM. The key pump parameters to focus on are the flow rate, on the x-axis of the graph, and the total head, on the y-axis of the graph.

In the upper left of the graph you will notice 9.5", 9" and on down to 7" – these numbers indicate impeller diameters (thick, solid black lines). Centrifugal pumps can be fitted with different impeller sizes, and for each impeller size the pump is limited to impeller line combinations of flow and head. For example, follow the 8.5" impeller curve until the curve lines up with 70 feet of total head (on the y-axis). At that point, this means that the pump will achieve a flow rate of 200 gpm.

At the top of the graph you will notice 50%, 60%, onto 79.5%, and then as you move farther to the right you will notice the number going down to 65% (thin, solid, horseshoe-shaped black lines). These percentages indicate efficiency percentages. So for this specific pump and RPM, the best efficiency point would be 79.5%. Generally speaking, as you step down impeller size you get farther away from the best efficiency point.

Near the bottom of the graph, notice the solid black line that moves from lower left to upper right. This line represents the net positive suction head required (NPSHR) in feet. This line indicates the suction side pressure required (in feet) to operate the pump at specific flow-head conditions. Generally speaking, if the pump is not supplied with adequate NPSHR then the pump will be subject to cavitation. This is the reason why pumps are often placed in the basements of water or wastewater treatment facilities.

This is a very brief overview, but nonetheless, it should provide some basic concepts behind pump curves. Be well, stay safe, stay efficient.

Centrifugal pumps come in a variety of shapes and sizes, and each pump comes with its own specific curve.
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- *Algoma*
- *Allouez*
- *Antigo*
- *Ashwaubenon*
- Bailey's Harbor WWTP
- Bear Creek
- Bellevue
- Birnamwood
- Black Creek
- Bonduel
- Bowler
- Brazeau Sanitary System #1
- Cecil
- Clintonville
- Coleman
- Combined Locks
- *Conserve School*
- Crandon
- Crivitz
- Darboy Sanitary District
- Denmark
- *DePere*
- Eagle River
- Egg Harbor
- Echo Sanitary District
- Embarrass
- Ephraim
- Fish Creek Sanitary District #1
- Florence
- Forest County Potawatomi
- Freedom Sanitary District #1
- *Gifford*
- Gildford
- Goodman Sanitary District
- Grand Chute
- *Green Bay*
- *Green Bay*
- *Green Bay*
- Gresham
- *Hiawatha Mobile Homes Estates*
- Hobart
- Holland Sanitary District #1
- Hortonville
- *Howard*
- Iola
- *Kaukauna*
- Kawana
- Kimberly
- Lakeland Sanitary District
- *Lakeland Village*
- Lakewood Sanitary District #1
- Land O' Lakes Sanitary District
- Laona Sanitary District
- Lawrence Utility District
- Leadville
- Lena
- Little Chute
- Luxembourg Wastewater Treatment Facility
- Manawa
- *Marinette*
- Marion
- Mattoon
- Menominee Tribal
- *Merrill*
- **Merrill Area Public Schools**
- **Natural Beauty Growers**
- New London
- Niagara
- Nichols
- **Northernaire Sanitary District**
- **Northland Mission Inc.**
- Oconto
- Oconto Sanitary District #1
- Oconto Falls
- Oneida Nation Utility
- Peshtigo
- Phelps Sanitary District
- Pound
- Pulaski
- Rhinelander
- Russell Sanitary District #1
- Scott
- Seymour
- Shawano
- Shawano County Utilities
- Shawano Lake Sanitary District
- Shiocton
- Sister Bay
- Sturgeon Bay
- Suamico
- Suring
- Three Lakes Sanitary District
- **Thunder Properties, LLC**
- Tigerton
- Tomahawk
- Wabeno Sanitary District
- Waupaca
- Wausaukee
- Weyerwega
- White Lake
- **Wisconsin Veterans Home**
- Wittenberg
- Wrightstown
- Wrightstown Sanitary District #1

**District 2 (Southeast)**

- **7 Mile Fair Inc.**
- Adell
- Albany
- Algoma Sanitary District #1
- Allenton Sanitary District
- Arlington
- Ashippun Sanitary District
- **Asset Development Group Inc.**
- **Autumn Ridge Water System, LLC**
- *Beaver Dam*
- Belgium
- Belleville
- *Beloit*
- Black Earth
- Bloomfield
- Blue Mounds
- Brandon
- Brillion
- Bristol
- Brodhead
- *Brookfield*
- Brookfield Sanitary District
- Brooklyn
- Brownsville
- Browntown
- Burlington
- Caledonia Water Utility District
- Cambria
- Cambridge
- Cambridge – Oakland Wastewater Commission
- Campbell Sport
- Cedarburg
- **Cedar Crest Specialties Inc**
- Cedar Grove
- **Cedar Lake Home**
- Chilton
- Cleveland
- Clinton
- Clyman
- Columbus
- **Concordia University Wisconsin**
- Consolidated Koskhoang Sanitary District
- Cottage Grove
- **Country Acres Mobile Home Park Ltd**
- **Country Aire Mobile Home Park**
- **Country Estates Sanitary District**
- **Cross Plains**
- **Crystal Lake RV Park**
- **Cudahy**
- **Dakota Capital Park**
- Dane
- **Dairyfood USA, Inc.**
- Darien
- Deerfield
- DeForest
- Delafield
- Delavan
- Delavan Lake Sanitary District
- **Don's Mobile Manor Inc**
- Dousman
- East Troy, Town of
- East Troy, Village of
- Eden
- Edgerton
- Elkhart Lake
- Elkhorn
- Evansville
- Fairwater
- Fall River
- *Fitchburg*
- *Fond du Lac*
- Fontana
- Footville
- *Fort Atkinson*
- Fox Lake
- Fox Point
- Franklin
- Fredonia
- Friesland
- Fulton
- **Geneva National Services**
- Genoa City
- *Germantown*
- Glenbeulah
- *Glendale*
- *Green Bay*
- *Green Bay*
- **Hale Park Meadows Water Trust**
- Harmony Grove Sanitary District
- Harrison
- Hartford
- Hartland
- **HB Performance Systems Inc.**
- Hilbert
- Horicon
- Hustisford
- Ixonia Sanitary District #1
- Jackson
- *Janesville*
- Jefferson
- Johnson Creek
- Juneau
- Kellnersville
- Kewaskum
- Kiel
- **Kikkoman Foods Inc**
- Kohler
- **Lad Lake Inc**
- Lake Como Sanitary District #1
- Lake Geneva
- **Lake Meadows Water Trust**
- Lake Mills
- Lannon
- LeRoy
- Lodi
- Lomira
- Lowell
- *Madison*
- Maple Bluff
- Maribel
- Marshall
- Mary Hill Park Sanitary District
- Mayville
- Mazomanie
- McFarland
- *Menasha*
- Menasha Utility District
- Menomonee Falls
- *Middleton*
- *Milwaukee*
- Milton
- Michicot
- Monona
- *Monroe*
- Monticello
- Mount Horeb
- Mukwonago
- *Muskego*
- *Neenah*
- New Berlin

*Associate Members (Over 10,000 pop.)

**Other Than Municipal**
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Turtle Lake  
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Kieler Sanitary District #1  

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La Valle  
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Lancaster  
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North Freedom  
*Onalaska*  
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Pepin  
Pigeon Falls  
**Pine Creek Water**  
**Pine Edge Mobile Home Park**  
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Rock Springs  
**Saint Bede Monastery**  
Sauk City  
**Sauk County Health Care Center**  
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**School District of Mondovi**  
Seneca Sanitary District #1  
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Shullsburg  
Soldiers Grove  
South Wayne  
Spring Green  
St. Joseph Sanitary District #1  
Stoddard  
Strum  
Trempealeau  
Viola  
Viroqua  
Wauzeka  
West Baraboo  
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Whitehall  
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Most systems are proud to be featured in our Rural Water Journal, but this quarter we are going to talk about a system that did everything right during this COVID-19 crisis, and dodged a very big bullet. This system wishes to be anonymous because scrutiny is just what they do not want right now. I feel it’s an important story to tell, especially since this COVID crisis is not going away and many systems can learn from these exceptional operation specialists, Director and administration.

It all started March 16, 2020 when Wisconsin Rural Water canceled the annual spring Technical Conference. A message of caution and preparation was sent out to all small systems in the state warning that the COVID-19 virus was real, and emergency action had to be taken immediately to continue operation in every water and wastewater system in the state. Reminders and action items for emergency response and planning had to be seriously considered and implemented. WRWA started a call for volunteers that were willing to take over a system that may have lost operators to the virus and could keep the water running, safe and treated.

Luckily, many systems acknowledged the circumstance and used the actions items in these warnings. One such municipality took this all to heart and developed action items that would, in the end, save them from catastrophe. This rural system set up an emergency response plan and used all it’s resources to set in motion a plan that could isolate operations and have certified operators at the ready if anything would happen. This system’s public Works Director works with several operators in both the water and wastewater programs, several street workers and several clerks in the city. The plan was to socially distance from each other at work, and to stay in self quarantine when not working. Several other systems were contacted and agreements were made to help each other if needed. Also, the city was home to several retired operators who were still certified, or had the knowledge to run operations if something happened.

Well, on May 8 something happened.

As with most families that work to serve others, operation specialists are married to nurses, teachers and other caregivers. One such caregiver possibly brought the coronavirus home with them from a care facility and infected one of the operation specialists in this system. Without knowing, when this operator came in to work his normal daily work, the other operators they worked with became exposed. (Now this is the theory. Nothing says that this pathway couldn’t have been the other way around.) When symptoms were felt two operators got tested for the virus and was confirmed, calls were made to all the contacts in the emergency plan, including WRWA, and this alert began the grueling series of tests, isolated work and fear of infection and operational disruption.

In the early days of the COVID crisis, it took quite a few days to get tested and get results. Within a week it was found that 2 operators became infected and got sick, and everyone else tested clear or did not get sick during the self-quarantine. In several weeks the system returned to a kind of normalcy. Everything was sure a lot cleaner and disinfected by that time! A lot of time was spent on cleaning, disinfecting and making everything safe for the return of staff.

Luckily, they did not get terribly sick and were able to eventually come back to work. When the operators became ill, even before the diagnosis was confirmed, the Director set the emergency plan into action with the help of the county health department. Everyone stayed distanced from each other and everyone self-quarantined. When the diagnosis was confirmed, calls were made to all the contacts in the emergency plan, including WRWA, and this alert began the grueling series of tests, isolated work and fear of infection and operational disruption.

We are very proud of the work that this very rural city did during this COVID event and how they came through by working the plan. We are also proud of all the help they received from other systems nearby. We have the highest regards for this system and the operations specialists, clerks and Director. We’ll be on their team any time!

THERE ARE SEVERAL MORALS TO THIS STORY:

- Never think these things won’t happen, or won’t happen to you. It does and you have to be ready.
- Always be ready with a plan. Planning is the only thing that will save you and your system for sure. Hoping and being lucky just doesn’t work.
- Keep in contact with neighboring systems. This is a kind of mutual aid that is free, is available, and can save your systems life.
- Keep in touch with your Department of Health, DNR, WRWA, PSC and others that you have at your disposal. Not only do you have to notify some of these organizations, but they can render help and information.
- Review your emergency plans and update them as needed. Keep a clean house and be aware that a cleaning regimen will avoid infection of any sort and prevent injuries too.
- Always listen to and work with Wisconsin Rural Water Association. We are also a “mutual aid” and we are available to you every day of the year.
NRCS Targets Source Water Protection Areas For Conservation Practices

The Natural Resources Conservation Service (NRCS) is the leading federal agency assisting in restoring watershed health on privately owned land. NRCS provides funding and technical assistance to agricultural producers who implement conservation practices that protect wetlands, improve water management and benefit water quality. Administrative provisions for NRCS conservation programs are laid out in the Farm Bill, which is revised every 5 years. The 2018 Farm Bill added a special provision for the protection of source water through targeting conservation practices. This provision encourages the protection of drinking water sources through three primary methods.

- Identifying local priority areas for drinking water protection in each State. This is done in collaboration with State Technical Committees and community water systems and may address concerns about either the quality or quantity of source water or both.
- Providing increased incentives for practices that relate to water quality and quantity and protect drinking water sources while also benefitting producers.
- Dedicating at least 10 percent of the total funds available for conservation programs (with the exception of CRP), each year beginning in FY 2019 through FY 2023, to be used for source water protection.

Basically, this is a mandate that 10% of NRCS conservation program funds be used in areas that directly benefit drinking water sources. As the Source Water Specialist for WRWA I already sit on the WI NRCS State Technical Committee (STC), which meets quarterly at the state office in Madison and provides advice on a wide variety of policy issues to NRCS. The STC was tasked with identifying the local priority areas which the NRCS will need to direct the 10% of their program funds. Within the STC, a source water protection subcommittee was formed to select these priority areas. I had the opportunity to work alongside DNR Drinking Water & Groundwater staff, NRCS staff and other NGO staff to develop the list of priority areas. We utilized public drinking water nitrate testing results to select areas that have known issues with elevated nitrate, and could benefit from the implementation of additional conservation practices. The second task the source water protection subcommittee was assigned is developing a list of conservation practices. This entailed taking the entire catalogue of NRCS conservation practices and selecting the ones that specifically address water quality concerns and meet the objective of source water protection. Farmers within the source water protection priority areas who are implementing the chosen priority practices which will help to protect drinking water sources will receive an increased incentive payment.

This ongoing effort is overseen by the national NRCS office which is tracking each state’s program spending to insure that 10% is used in the chosen source water priority areas. The national office will decide on the ongoing execution of the Farm Bill SWP provision which will likely involve revising the priority areas to improve the objective of protecting drinking water sources. As the National office hands down directives to the state office, they will continue to utilize the State Technical Committee and Source Water Protection Subcommittee. WRWA will continue to participate on these committees and represent the interest if water utilities in the state.

Andrew Aslesen, WRWA Source Water Specialist
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I would like to take a little time to talk about laterals. Laterals are those items that don’t get thought about until you need them. There are basically two parts to a lateral, the utilities portion and the customer’s portion. The utilities portion consists of the corporation, the line and through the curb stop and stand. The customer’s part is anything beyond the curb stop. Where the curb stop is located is of importance to the utility. For any new installations or replacement of older laterals, curb stands should be as close to the edge of the right of way as possible and at grade or just slightly below grade for easy locating. When in sidewalks or driveways a plastic sleeve should be used to allow the curb stand to move. The reasons for placing the curb stand at the edge of right of way are that the utilities are responsible for doing locates to the edge of the right of away, so if curb stand is at the edge then you locate to that point. If beyond the right of way, you are still responsible to locate what belongs to the utility. When short of the edge of right of way you must still locate to the edge of right of way. When making repairs or extending a lateral, remember the utility is responsible to the last valve, do not leave a valve in the ground beyond the curb stop. Public Service Commission will determine that the line is the utilities to the last valve and the utility will be responsible for repair cost to the valve closest to the structure. PSC 185.52(2) says that laterals shall be placed at such depth or otherwise protected to prevent freezing.

PSC 185.88 tells us what needs to be done when a lateral freezes and who is responsible. Utilities are responsible when freeze-up is a direct result of disconnection during times of freezing is a possibility. When customers lateral is electrically conductive and it is the first thawing at the location and the utility has not provided customer with a seasonal notice of the corrective action to be taken for a known condition. PSC185.88 also tells of the customers responsibilities for lateral freeze-ups. Lateral thawing shall be the customer’s responsibility if the lateral is not electrically conductive and not the cause of a utility disconnect. The customer neglected to provide or maintain proper insulation or protection according to general accepted practices or specific utility instructions. Utility advises of corrective measures and the customer does not follow utility advice. The utility can ask a customer to run their water for a deficiency on the utility side of the lateral, adjustments in cost must be made to the customer PSC 185.35(7)

SPS 382.40(4) of the plumbing code talks about lateral installation for corporation and curb stops this chapter also says that in SPS 382.40(2) All water supply systems shall be constructed of approved materials according to SPS 384.30(7) a chart tells of what materials can be used for laterals and private mains.

Locating of water and sewer lines and laterals according to Chapter 182 Miscellaneous Corporate Provisions; Turnpike Corporations Subsection 182.0175(2m) Talks about owner responsibility to locate lines, time frames to do the locates, color of paint or flags to use for water blue and sewer green. The code also states that you need to mark everything in the right of way, laterals as well as mains. Section (bm) Local Government Units. Local government units are considered to have satisfied marking requirements if presenting maps, drawings etc. to the excavator. If the utility has no such records a written notice must be presented to the excavator stating no records exist. This was a quick rundown of information; Utilities should have these codes readily available to read in-depth and understand.

Jeff LaBelle, WRWA Technical Assistance Director

Where the curb stop is located is of importance to the utility.
NOW IS THE TIME TO ACT
Get Started on Your Water Utility Construction Project

Do you have a Water Utility Construction Project? Now is the time to act! Rates are at an all time low, and with the current pricing being opportunistic and taking action can result in benefits not only for yourself but for the customer as well. Consider the below items that detail positive reasons to act now that you can present to your governing body.

- Interest rates are at an all-time low.
- More project contractors are available, increasing the number of bids, potentially lowering project costs.
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- Most material costs for projects are down.
- Shipping costs for many have decreased.
- Road and water projects are easier to schedule due to decreased volume in traffic.
- Low construction costs and available contractors are not guaranteed to last.

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If you’re a public employee in the State of Wisconsin, you are governed by the Department of Safety & Professional Services, SPS Code 332. They have only adopted up the July 1st, 2010 OSHA regulations and apply them to public employers.

So, you are 10 years behind the rest of the country, both public and private industry. Some people are okay with this. But the question is, what happens when they update SPS Code 332?

Here are some of the changes you can look forward to:

**MOBIL CRANE STANDARD** came out AUGUST 2010.
29 CFR 1926.1427 Operator training, certification, and evaluation.

**OPERATORS**
The employer must ensure that each operator is trained, certified/licensed, and evaluated in accordance with the standard.

- The employer must provide each operator-in-training with sufficient training, through a combination of formal and practical instruction, to ensure that the operator in-training develops the skills, knowledge, and ability to recognize and avert risk necessary to operate the equipment safely for assigned work.
- The operator-in-training must be continuously monitored on site by a trainer while operating equipment.

**EXCEPTIONS**
Operators of derricks, sideboom cranes, or equipment with a maximum manufacturer-rated hoisting/lifting capacity of **2,000 pounds or less** are not required to comply with operator qualification and certification.

**HAZARD COMMUNICATION STANDARD** came out March 2012.

GHS Safety Data Sheets and GHS Labels, **no more** MSDS’s or old labeling system. Labels of all hazardous chemicals will consist of:

- Product identifier (trade name or chemical name);
- Hazard pictogram(s);
- Signal word;
- Hazard statements;
- Precautionary statement; and
- Manufacturer/Supplier name, address and emergency contact information.

**CONFINED SPACE CONSTRUCTION STANDARD** came out AUGUST 2015
29 CFR 1926 Subpart AA Confined Spaces In Construction
“Construction Work” means work for construction, alteration, and/or repair, including painting and decorating.

**COMPETENT PERSON** - before it begins work at a worksite, each employer must ensure that a competent person identifies all confined spaces in which one or more of the employees it directs may work, and identifies each space that is a permit space, through consideration and evaluation of the elements of that space, including testing as necessary.

Under the construction rule, a competent person – a person capable of identifying existing and probable hazards and who has the authority to take corrective measures must identify all confined spaces. The competent person must also identify all permit spaces those workers will enter, and those they will not.

**WALKING/WORKING SURFACES** standard came out November 2016
Fall protection systems and falling object protection-criteria and practices.
29 CFR 1910.29 General Industry Walking-Working Surfaces And Fall Protection Standards

It eliminates the existing mandate to use guardrails as a primary fall protection method and allows employers to choose from accepted personal fall protection systems they believe will work best in a particular situation - an approach that has been successful in the construction industry since 1994.

New rule includes:

- Ensuring exposed workers are trained on fall hazards,
- Ensuring workers who use equipment covered by the final rule are trained,
- Inspecting and certifying permanent anchorages for rope descent systems,
- Installing personal fall arrest or ladder safety systems on new fixed ladders over 24 feet and on replacement ladders/ladder sections,
- Ensuring existing fixed ladders over 24 feet, are equipped with a cage, well, personal fall arrest system, or ladder safety system,
- Replacing cages and wells (used as fall protection) with ladder safety or personal fall arrest systems on all fixed ladders over 24 feet (20 years).

**Phase-In Ladder Safety Systems Or Personal Fall Arrest Systems On Fixed Ladders**
The rule phases in over 20 years a requirement to equip fixed ladders (that extend over 24 feet) with ladder safety or personal fall arrest systems and prohibits the use of cages and wells as a means of fall protection after the phase-in deadline.

There is wide recognition that cages and wells do not prevent workers from falling from fixed ladders or protect them from injury if a fall occurs. The standard grandfathered in cages and wells on existing ladders, but requires during the phase-in period that employers equip new ladders and replacement ladders/ladder sections with ladder safety or personal fall arrest systems.

**Also Updated Scaffold Requirements**
The final rule replaces the outdated general industry scaffold standards with the requirement that employers comply with OSHA’s construction scaffold standards. Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration.

**Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.**

**Silica Dust** standard came out June 2016

- The rule requires that employers limit workers’ exposure to respirable crystalline silica dust, which can become airborne during tasks such as cutting, grinding, drilling, or crushing materials containing crystalline silica such as brick, concrete, stone or mortar.

Workers can also be exposed to respirable crystalline silica during operations that involve the use of industrial sand and abrasive blasting with sand. Typical methods to reduce or eliminate dust in the air include wetting down the operation or using local exhaust ventilation. In addition to requirements to limit workers’ exposure, the rule requires employers to take other steps to protect workers, such as providing training to workers exposed to respirable crystalline silica and offering medical exams to highly exposed workers.

Good news is, there will be more regulation changes when they finally decide to update. The process usually takes 5 years to update and pass. Which means, if they did it now, you would be 15 years behind every other state. Don’t panic, there’s nothing in the works right now. But when they finally decide to update, there will be a cost involved in training and safety equipment, all at once.

Remember, it’s all about going home.

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**Vince**

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A balloonist floating over the Wisconsin River valley had a bird's eye view of the landscape. “You don’t realize how many different shades of green exist until you look from above,” he remarked. “Wisconsin is really green.”

Shades of summer green - grasses, trees, bushes, ferns, weeds and crops – as far as the eye can see are with us now. Green leaves of all the plants are acting as solar collectors, their cells gathering power from the sun. Photosynthesis at work, turning sunlight into sugar - using water and releasing oxygen and in the process creating the green pigment chlorophyll. To follow-up the aviator’s observation, I paused out back the other night and gazed over the treeline surrounding our field of prairie grass.

The family weeping willow stands out in a world of green – its leaves with whitish undersides in concert with bright green topsides, paint an image of sage brush silver-green. Waxy aspen leaves tremble, reflecting yellow-green, while green maple leaves appear dipped in shades of red and purple. Dull green birch leaves cling to drooping branches and sway in the wind. The oaks at the end of the field are much bolder; their shiny dark green leaves are accompanied by splashes of young yellow-green acorns.

The prairie grasses of our field, supported by green stems and leaves now flaunt colored flowers. Leadplant, milkweed, indigo, blazing star and lupine – just to name a few, turn a mundane green field ablaze.

Across the road is a field of corn, waist high and sprouting several layers of green leaves, pale yellow silk topped ears and stalks that point to the clouds. Young, succulent soybeans down the road are taking on a deeper green hue and attract grazing deer at dawn and dusk, while freshly cut hayfields in every direction, littered with thousand pound round bales, serve as dinner tables for families of cranes.

The swamps and bogs north and west of here are also green with summer growth of cattails, alder, sedges, bulrushes and lilies. Bogs, like those bordering nearby cranberry marshes are dominated by sphagnum mosses, sedges, leatherleaf and laurel.

Our backyard lawn, complete with assorted weeds and seedlings, battles the mower and grows green and lush with abundant rain and sun.

In a few months, when days become shorter, chlorophyll production will slow down and uncover other, more vibrant pigments. And with that, grasses, ferns, shrubs and trees will turn the colors of fall.

Until then, enjoy summer’s shades of green!

Yours in good health, Ken

Ken M. Blomberg is the past Executive Director of the Wisconsin Rural Water Association. Ken has written 2 books since his retirement. Autographed copies his first book, UP THE CREEK, are now available for $16.33, postage paid. A portion of the sale proceeds will be donated to WRWA’s scholarship program. Send checks payable to Ken M. Blomberg, 2099 Mayflower Road, Junction City, WI 54443.
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