



Wisconsin Rural Water Journal

Fall 2020

Updates on Some Common Questions

New Operators

Another Tool

It's All About Control

Nitrate in Your Water

Fatbergs

Wellhead Protection Area Delineation

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In Every Issue

- 2 Message from the President
by Ramon Knudtson
- 3 The Summer that Wasn't
by Chris Groh
- 7 WRWA Corporate Gold Members
- 12 PSC Water & Sewer Rate Orders
- 12 PSC Construction Authorizations Issued
- 13 WRWA Membership and Advertising Rates
- 20 WRWA System Members
- 26 WRWA BUSINESS Members
- 34 Classifieds
- 38 WRWA Corporate Members
- 44 WRWA Calendar
- 45 Advertiser's Index

FEATURES

- 4 How to Expedite Your Water Rate Case While Working with the PSC
by Bridgot Gysbers & Ed Maxwell of Ruekert & Mielke, Inc.
- 6 Updates on Some Common Questions
by Jesse Hass
- 8 Loaner Equipment for Municipal Use
by Annetta Von Rueden
- 9 New Operators
by George Taylor
- 10 Another Tool
by Kelly Thomas
- 14 It's All About Control
by Kay Curtin
- 16 Nitrate in Your Water
by Todd Weich
- 18 Fatbergs
by Tony Roche
- 24 Wellhead Protection Area Delineation
by Andrew Aslesen
- 28 Winterizing and Maintaining Water Hydrants
by Jeff LaBelle
- 30 Up the Creek
by Ken Blomerg

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Address all letters to the editor, advertising inquiries and correspondence to:
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Ramon Knudtson,
WRWA President, Melrose

Here we are, fall is fast approaching. What a 2020! Wild fires in the west and northwest, tropical storms in the south and southeast, snow already in the west, frost northern Wisconsin and heavy down pours! I am not trying to hurry things along, but, 2021 can't get here quick enough. I want to thank all the operators, staffs, and communities for all their hard work to keep the water and wastewater departments up and running. After 39 years in the industry I thought I had seen it all; it's still amazing to say. Great job by Chris and his staff to stay safe but be there to help out with any problems in Wisconsin. They now are putting on the virtual classes but being from the old school I can't wait to get back and meet everyone in person.

Thanks to my fellow board members for being able to meet and keep up with things going on in the state.

The last thing, I would like to thank everyone for allowing me to sit on the board since 2002. In March my term will be up and hopefully I'm going to retire in the next year or two. I want to get the word out at this time so if you are from district 3, take some time to consider running for the board. I have enjoyed being on the board and seeing all the different things that go on in the great state of Wisconsin and all of the United States. If you have any questions on being on the board, contact Chris at the office or myself. Everyone stay safe and have a great end to the year 2020!

Ramon



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Chris Groh,
WRWA Executive Director

The Summer that Wasn't

I look forward to Summer more than any other season of the year. I really like the heat and all the things you can do outside during those long days. Fishing, hiking, even lawn work is enjoyable for me since I was a kid. After I started working Summer allowed me to get my job done and still have daylight left for screwing around on the lake or in the woods. Now in my older age the heat isn't all that bad, but the time fritters away awfully quickly. I don't nearly have the time I would like to have to fish or get outside. This Summer even if I did have the time, there was really nothing to do but wait for a pandemic to pass by, just like the Summer. Not fun and certainly not easy to work with since we are an association dependent on meeting people and helping them with problems that involve public and environmental health. This time of adaptation to this pandemic is showing us all how important it is to follow health guidelines and to have an ability to give up some of the things we like to do for the greater good and our families and neighbors.

I hope that all of you are still sticking with your emergency response plans for your daily work and updating them to take into account that this situation will last into and maybe through Winter. Being inside more will result in greater chances for infections and getting exposed. By no means should we think that this pandemic is going to go away by itself, or will disappear. It is now more intense than it has been since the start and the chance of getting COVID is very real. Your ERPs have to reflect the changes that have been going on and the possibility that you, your staff, or your family and friends will get sick.

As for Rural Water, we have had to cancel everything involving more than just a few people. Recently, we had to cancel our Outdoor Expo and have it virtually. It was very successful and we got a lot of CEUs to operators that needed them, but it just wasn't the same as seeing old friends and saying hey, how're you doing. The nicest thing I heard this summer was how everybody was saying that they really missed that also. Believe me, we do not like the virtual environment and we'll be going back to hey, how're doing as fast as we safely can!

Also missing this summer was a lot of in person training. Again, we do not like the virtual training, but it did open up the chance for you all to join a class from anywhere in the state and get some CEUs. We have to thank the DNR for giving us this opportunity to do these classes on line; and again, we will go back to in person as soon as we can.

Also missing this summer was any legislative activity. You may not know it, but Rural Water does a lot of lobbying and behind the curtain work on behalf of your municipalities and cities. There was a real lack of activity throughout the summer, but the election slowed or stopped a lot of the

activity, as well as the pandemic. Nothing ever seems to happen when the state and federal legislators are campaigning. Something you do learn in my capacity is that someone is always sneaking around and writing legislation out of the spotlight, so we do keep watch on that. Speaking about that, if you have an issue that you see as having an effect on this industry, please let me know and I will explore how to proceed.

So, Summer has come and gone, and Fall is here to remind us that we have to get ready for Winter. Maybe before that happens, I can get a musky fishing trip in. If I'm really lucky maybe a grouse hunt or two. Never can tell, maybe even a vaccination!

Everyone please be safe and don't let your guard down. Stay healthy and I'll see you soon.

Chris

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HOW TO EXPEDITE YOUR WATER RATE CASE WHILE WORKING WITH THE PSC

Bridgot Gysbers, Ruekert & Mielke, Inc
Ed Maxwell, Ruekert & Mielke, Inc.



The Wisconsin Public Service Commission (PSC) regulates water utilities. Before a utility can raise its rates, it must file for a rate increase with the PSC. This process can be slow and labor intensive. However, there are a few best practices that will make it easier.

In its application, the utility provides detailed information and proposals about the rate increase request. PSC staff analyze the utility information and proposals and develop additional information including additional proposals. The PSC also requests a comment period and holds a hearing to gather information, ideas and opinions regarding the issues raised in the utility's request. The Commission will then review this information and determine if a given rate increase is appropriate.

BEST PRACTICES

The PSC has specific rules that must be followed prior to planning as part of the process. Learn how local communities like yours can apply some best practices to the process and reduce effort:

- 1. Have Information Organized at Time of Application.** Being well organized allows more timely responses to PSC data requests in addition to being more prepared to respond to inquiries by customers and the Utility Commission.
- 2. Consider Timing.** On average, it takes approximately 8 months to a year to implement rates after filing for the most straight forward cases. This should be taken into consideration in the early planning phases to determine the best time to apply.
- 3. Review Construction Approvals Prior to Filing.** For projects that require construction approval, ensure your utility has received approval for all necessary projects prior to filing. Not obtaining the necessary approvals may cause significant delays.
- 4. Do not be Afraid of Incomplete Application Letters.** The PSC performs an initial screening of rate case application once filed. The purpose of this is to correct items that were not completed accurately that could significantly delay the rate case process. These incomplete application letters are an opportunity to correct items in the application to aid in the expediency of the rate case process both for the utility and the PSC.
- 5. Be sure Applications are Complete.** There are common issues in certain areas of applications that do cause significant delays in the process which are now reviewed during the initial screening process of the application. These issues are as follows:
 - a. Thoroughly complete Attachment 19 and 19a of the rate application
 - b. Resolve problems with any customer billing data
 - c. Classify plant properly
 - d. Classify Contributions in Aid of Construction (CIAC) plant accounts in both test year and prior year.
- 6. Expect Lots of Questions and Answers from the PSC in Data Requests.** By responding to PSC data requests with detailed-oriented responses and in a timely fashion will aid in the expediency of the rate case. Many of the delays occur during this phase.
- 7. Submit your Own Cost of Service Study and Rate Design.** Submitting your own Cost of Service Study and Rate Design provides more input into your overall rates and more control over the outcome. In addition, the PSC may use your Cost of Service Study and Rate Design as a starting point rather than starting from scratch.
- 8. Keep your Governing Bodies Informed.** It is best to keep your governing bodies informed early and throughout the rate case process. Doing so could avoid any future delays.



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UPDATES on Some Common Questions



Jesse Hass,
WRWA Wastewater Technician/Trainer
Wastewater Specialist

Here is a quick update on a few things I have been getting calls on in the past couple of months.

E. COLI TESTING

For a few communities that have been issued a new permit, the early stages of E. coli testing has begun. E. coli testing will replace fecal testing over the course of the next few years as communities are issued new permits. A few methods have been approved for E. coli testing by the DNR. There is a link to an informational sheet about E. coli testing on the DNR website. To find the sheet, type in "WI DNR" and "E. coli testing" in your search engine and the link should pop up. There are currently 3 approved methods for E. coli testing. The first is the Hach membrane filtration method, mColiblu-24®, it is a media that can be used to quantify E. coli. This method is very similar to fecal test where colonies are grown in circular trays. After the sample is placed in the trays and incubated, you count the number of colonies that grow in the tray. The second method is Colilert® and Colilert-18® by IDEXX Technologies. In this method, the sample is placed in a multiple well tray and sealed and incubated. After the sample is incubated for the appropriate amount of time, wells that have E. coli will change color. The third method is a two-step multiple tube fermentation process that is not

used very often because it is less precise and more labor intensive. Kay and I are doing a bit of leg work for an E. coli class. Kay has experience working with the companies that developed these tests. Hopefully later this year, WRWA will have an E. coli basics class on the calendar.

DATA COLLECTION

For those of you out there that run a plant, the more data you compile, the easier it will be to run your plant. When Kay and I get a call to assist with a plant, the more data you have, the more avenues we can pursue to get your plant straightened out. You may have heard me say this at a stop or I may have written it in the past, collect information regularly. If you call us and want us to help you, consistently collected data is very useful. If you have an upset and you want to look at your wastewater under a microscope, it helps if you use a microscope periodically so you know what bugs populate your plant when it is operating correctly. I'm not saying you need to do it every day, but a weekly or monthly check will help you understand how your plant operates. If you don't have a microscope, give us a call, WRWA has a couple to loan out. Other things you can do to amass data are a 30 minute settling test, a mixed liquor suspended solids test, and sludge depths, among other things. Even if

Mapping this summer and fall has been pretty hit or miss. I am starting to set my schedule for next spring and summer now.



you send out your samples to a lab, some of these tests to monitor process control can be done at your plant with little cost and time invested.

GPS

For most of us this year, things have not gone as we had hoped. My initial idea for this summer was to schedule visits to help communities with mapping basics. That plan did not happen as I thought it would. Mapping this summer and fall has been pretty hit or miss. I am starting to set my schedule for next spring and summer now. If you are interested in seeing if mapping is something for you. Get in contact with me, and I will stop out or have a coworker stop out to give you a rundown of mapping options. When we stop out we discuss what web based options for mapping are available, basics of using these services, and how to GPS points into your map using one of our GPS receivers. I would like to give a shout out to Gale Shea, from Seiler Instrument Company, who recently loaned WRWA a Trimble R-1 unit. WRWA now has 2 GPS units at our disposal, a Trimble and an Eos Arrow. These GPS receivers are available to be loaned out to communities for adding assets to a map. I am looking forward to hearing from many communities in the upcoming year who would be interested in getting a start on adding assets to digital map.

Jesse

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Loaner Equipment for Municipal Use



By Annetta Von Rueden

As we say good-bye to another Summer, we feel that fall is surely in the air. When we sit in our deer stands and the last of those tiny mosquitoes are really good at pestering us so we cannot swat at them while “the big one” is within shot! These are little reminders that Summer is truly at the end. The Summer weather was plenty warm, thankfully we did have our share of nice sunny days. Finally, I hope you had a good Summer and were able to enjoy good times with family and friends.

Heading into Fall, there are always those catch-up items leftover from the summer job list before Old Man Winter is knocking on the door. Some of those items on the list could be hydrant flushing, fire flow testing, valve turning, curb stop exercising, and marking curbs and valves with blue marking paint. It is sure easier to find a curb stop under a snow bank or ice in the winter when you come across that blue mark.

To help make these jobs easier WRWA has a large inventory of loaner equipment available. There are fire flow test kits, a variety of hydrant diffusers. For example, there are two truck mount diffusers, 4 ½” pumper nozzle diffusers, and hydrant seat wrenches for repairs. We now have 2 trailer vacs. Some popular items are the power valve exercising wrenches, flexible curbstop wrenches and SeeSnake cameras to view down valve or curb boxes. We



...this equipment always comes with a WRWA Circuit Rider ready to assist you if needed.

have line tracers; leak detectors and pressure relief valves are another popular item. These valves are mainly intended to be used for tower inspections and painting when you need to run the wells continuously. The pressure relief valves work great and relieve the pressure from the water mains so the mains won’t break when you are running the wells steadily. Or if a situation arises where the distribution system has to be isolated from the water tower.

You can check out the complete loaner equipment list at our website. WRWA.org; scroll to resources, then scroll to other resources which directs you to the loaner equipment list.

Remember, this equipment always comes with a WRWA Circuit Rider ready to assist you if needed. We have equipment coming and going all year long. With the addition of a third Circuit Rider, the Circuit Rider’s are able to move the loaner equipment to water and wastewater systems a lot more quickly. All it takes is a phone call.

THANK YOU to the systems and vendors for your many donations to the loaner equipment fund that you have made in the past. We wouldn’t have our loaner equipment without your help!

Have a safe and enjoyable fall especially the display of colors.

Happy Fall Ya’ll — *Annie*

New Operators

By George Taylor

Hello Everyone,

Today I would like to talk all the New Water distribution System operators entering the field. Offer a couple of good references and pointers to get started.

First off, make sure you're checking your Water Sampling Requirements. You don't want to fall into non-compliance by forgetting to get samples in on time. To avoid this simply check the DNR website (dnr.wisconsin.gov) or contact your DNR rep for all your water sampling you may have during the year.

Another thing you want to start doing is performing regular routine maintenance on your water system. Keeping good records and checking your system for any flaws that may need to be corrected. Always have good maps and contacts of your system handy for any emergencies that you may encounter.

Make sure you're keeping up with training and keeping informed on the newest technology being used in the field. We at Wisconsin Rural Water Association, provide various In- person and Virtual online training all throughout the year. Just check our Web site at www.wrwa.org and get registered.

These are just a couple things to get you started on operating your water system. Remember you can always contact your nearest WI -Water Circuit Rider or WI -DNR Rep with any technical assistance you may need. We are always happy to assist.

Thanks for Reading,

George Taylor
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ANOTHER TOOL

By Kelly Thomas

Continuing Education in the Wisconsin water industry seems to be in high demand. WRWA along with most all organizations in the state have put the brakes on live in-person training since the pandemic smothered our country. In the past, WRWA would pride ourselves as the leaders of continuing education training for the water industry. We understand that nothing can truly replace the interaction and networking of in-person training. Currently, we are trying to find ways to satisfy the need of training while keeping the attendees and presenters safe. This juggling act is something that we have never experienced before.

Having on-line meetings or videoconferencing is the direction that this whole country has turned to for the last 6 months. As we dip our toes into this seemingly new technology, we are finding that these on-line tools are quite user friendly.

I remember as a kid watching the "Jetsons" cartoon thinking how cool it would be to have a videophone to actually see the person that you were talking to. I remember watching movies with the same technology thinking that this is just "Hollywood technology." Or thinking this technology was just for fortune 500 companies. Well guess what...the technology is here and is for everyone to use.

This technology has been forced upon us very quickly and without warning. Whether you are in favor of this new "high tech" way of delivering continuing education training or not, you really do not have

We understand that nothing can truly replace the interaction and networking of in-person training.

much of a choice but to follow the pack and get upgraded to what technology can provide. This on-line training opened a new door for continuing education. Once WRWA gets a real grasp of this as well, on-line training is one more tool we can use to keep you operators "in the loop" no matter where the training is actually being held.

Currently, 'Zoom' has been our platform of choice for WRWA training. We also use it for our staff meetings since our staff all live in different corners of the state. Yes, you can still call in on your phones, however, videoconferencing offers the ability to share video, share PowerPoint presentations, and use visual aids. It is time to upgrade your equipment so you can follow the herd and stay educated. Bye-bye flip phones... hello smart phones and tablets. If your computer does not have video features, your smart phones and tablets probably have the capability to participate.

Like most of you, I want the world to go back to normal so we can, once again, have in-person training. But it is nice to have another tool in the tool box.

Until next time, *Kelly*



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PSC WATER RATE INCREASE ORDERS ISSUED

JUNE 1, 2020 – AUGUST 31, 2020

UTILITY NAME	ORDER ISSUED	OVERALL% INCREASE
Lowell Municipal Water and Sewer Utility	06/10/20	62.85%
Belleville Municipal Water and Sewer Utility	06/11/20	49.17%
Richland Center Water Utility	06/11/20	30.69%
Whitewater Municipal Water Utility	06/11/20	19.99%
Madison Water Utility	06/22/20	8.82%
Monroe Municipal Water Utility	06/29/20	18.30%
Juneau Utility Commission	06/29/20	14.82%
Pewaukee (City of) Water Utility	07/20/20	19.77%
Blanchardville Municipal Water Utility	08/10/20	79.06%
Montello (City of) Water Utility	08/10/20	71.25%
Lake Como Sanitary District #1	08/17/20	30.56%
Oakdale (Village of) Water Utility	08/19/20	18.66%
Allenton Sanitary District No 1	08/26/20	(1.33%)
Pepin Municipal Water Utility	08/26/20	95.84%
Stoddard Municipal Water Utility	08/26/20	37.50%

PSC CONSTRUCTION AUTHORIZATIONS ISSUED

JUNE 1, 2020 – AUGUST 31, 2020

UTILITY NAME	ORDER ISSUED	CONSTRUCTION COST
Muscoda Light and Water Utility	06/17/20	\$797,400
Drummond Sanitary District 1	06/17/20	\$49,313
Monona Water Utility	06/11/20	\$901,000
Onalaska Municipal Water Utility	06/17/20	\$1,520,100
Weyauwega (City of) Water and Sewer Utility	06/17/20	\$2,825,135
Washburn Municipal Water and Sewer Utility	06/29/20	\$358,559
Weyerhaeuser Municipal Water Utility	07/20/20	\$35,495
Wauwatosa Water Utility	07/30/20	\$1,622,494
Wilton Municipal Water and Sewer Utility	07/15/20	\$69,200
DeForest Municipal Water Utility	07/15/20	\$1,042,905
Montfort Municipal Water Utility	07/06/20	\$49,000
Janesville Water Utility	08/17/20	\$200,437

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IT'S ALL ABOUT CONTROL

Kay Curtin
WRWA Trainer/Technician

Recently, I've been called to a number of wastewater plants, both mechanical and pond systems, that were in dire straits. The good news is that plant upsets can usually be corrected, although finding the root cause of the problem isn't always a quick process. An operator must ensure that the problem does not recur again and again, which is common if a solution isn't found.

The most important tool that an operator can use is process control. You've probably heard me go on and on about this subject, but it holds true for every single wastewater plant in the state. There is no such thing as a plant that runs itself. Remember that line. Salespeople and not-so-honest design firms and suppliers will try to tell you otherwise. YOU need to know what's going on in your plant on a daily basis, no matter how large or small it is.

What can you do with a pond system, you ask? If it's mechanically aerated, you need to be testing the dissolved oxygen on a daily basis, especially in hot weather, and adjusting the aeration accordingly. I will admit, Mother Nature is the main controlling agent for non-aerated stabilization ponds, but there are multiple tools that you can still use to monitor the health of the plant. Dissolved oxygen is probably the most important. If you do not have a D.O. meter, you probably do have some cute little friends that are more than happy to let you know they are stressed. Daphnia, a tiny common pond water crustacean, will turn red when stressed, usually because of low oxygen levels. So, if you see a red cloud in your pond on a hot summer day and your plant is looking sad, it probably is a lack of oxygen.

Mechanical plants offer a range of control options. However, before you can make changes, you need to do some testing to know your operational criteria. Dust off the solids oven that's been stuck under the counter. Find the desiccator that's in the storage room. Purchase a balance. If you do your own mixed liquor suspended solids (MLSS) testing, you can save a wait of up to a week for results. This is critical to determine wasting rates, return rates, F:M ratios and other parameters. Do a 30-minute settling test; no fancy equipment required; just a 1000 mL cylinder and a timer. Calculate your Sludge Volume Index. Calculate your wasting rates to maintain a stable amount of MLSS or sludge age. Look at your mixed liquor under a microscope weekly (and take WRWA's microbiological training when this pandemic is over and we're able to do hands-on classes again). Most importantly, check your D.O. levels. These are aerobic bacteria doing the work for you. They need a minimum 1.5-2.0 mL of oxygen to survive and break down the waste.

If you have phosphorus or nitrogen limits in your permit, process control is even more crucial.

By using a colorimeter or spectrophotometer, you can test levels of orthophosphate, ammonia nitrogen, nitrites and nitrates. In order to do biological nutrient removal, you must monitor these parameters. If you are doing biological phosphorus removal, your dissolved oxygen meter will be unable to tell





you if you have a truly anaerobic environment in your fermentation selector, as it only reads down to 0 mg/L. This calls for an ORP (oxidation reduction potential) probe. ORP is the measurement of electron addition or reduction in millivolts, so a pH meter is all that is required to be used with the ORP probe. A truly anaerobic zone will be -300 mV, an anoxic zone -50 to +50 mV, and aerobic +200 or more.

The old "run the plant by sight and smell" theory isn't quite enough. When your plant goes South, and you telephone Jesse or me for help, we're going to be asking about results of many of the aforementioned tests. If you don't know them, it's going to be like getting your deer on opening day without a gun. Also, if you regularly test your wastewater, you will be able to determine YOUR optimal operating parameters and can strive to keep your plant within those ranges. Yes, all of this takes a bit more time, but your employer has made a large investment in your wastewater treatment plant. You are being monitored and are expected to stay within your WPDES limits. You need to do your job properly, and your employers need to understand that.

If you have questions about lab analyses and equipment, process control testing and interpreting results or other operational issues, call Jesse or me. As Red Green used to say, "We're all in this together". Hopefully not above our knees without waders.

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Nitrate in Your Water



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Todd Weich,
WRWA Water Circuit Rider

A vast majority of farmers apply nutrients to their fields in the form of fertilizers which provide crops with the chemicals necessary to grow. Nutrients, such as nitrogen and phosphorus, are not harmful if used sparingly. However, when farmers over fertilize, excess nitrogen is washed from fields into streams and rivers, and over time it can reach the groundwater. Once the colorless, odorless, and tasteless chemical reaches the water, it causes several adverse health and ecological effects including blue baby syndrome, dead zones, and algae blooms.

Nitrogen contamination of groundwater from agricultural runoff is a growing problem. A vast majority of the population of the United States relies on fresh groundwater as the primary source of water. Nitrogen does not attach to soil particles which results in the nitrogen being easily moved by water. When it rains, the soil becomes wet and the void air spaces in the ground become filled with water. Overtime, the air spaces become filled to a point that forces the water with the nitrogen to be moved downward into the soil to the ground water, which supplies your house with what used to be fresh water. Consuming too much of the tasteless, odorless, and colorless nitrogen can cause serious illness or death.

When the contaminated water makes its way into our nearby lakes and streams, excess nitrogen can cause the growth of algae to increase beyond what the ecosystem can handle. With the overstimulation of the algae, it creates large growths of algae called algal blooms. As the algae dies off, algal blooms sink to the bottom blocking vital sunlight from reaching underwater plants that provide food and shelter for other animals. Algal blooms also create a severe decrease or even elimination of the oxygen in the water. Algae which contaminates the lakes and rivers is the top reason that all the local beaches get closed.

Algal blooms from agricultural runoff can also lead to the death of many marine mammals and shore birds that rely on the marine ecosystem for food. Every year, the Gulf of Mexico has a seasonal zone that appears. That zone is called a Dead Zone. The dead zone in the Gulf of Mexico spans to just shy of 8,500 square miles. Due to the lack of oxygen in the water from the thick algal bloom created by excess nitrogen, many of the fish and organisms die which in turn causes access to fewer fish. Herons and sea lions for example, have a harder time surviving after losing their important source of food.



Some algal blooms created by excess nitrogen are even harmful to humans because they can produce elevated toxins in the water. Since the late 1800's, Lake Erie has been known for a reoccurring algal bloom. In the late summer and early fall, a cyanobacteria called Microcystis and Panktothrix blooms close to the shore of Lake Erie. The nutrients that fuel those cyanobacteria blooms come from agricultural runoff. If consumed, Microcystis can cause numbness, nausea, dizziness, vomiting and ultimately, it can lead to liver damage. In rare cases, it can be deadly. On August 2, 2014, the microcystin levels were higher than recommended by the World Health Organization of 1.0 parts per billion. For 3 days, WHO warned over 400,000 residents not to drink or cook with tap water as boiling was ineffective against the toxin. Due to the agricultural runoff of excess nitrogen into Lake Erie, treatment facilities have since added extra water filtering steps.

According to Wisconsin DNR code NR 809.11(2) the maximum contaminant level for nitrate is 10 mg/L with the exception of 809.11(3) which states that at the discretion of the department, nitrate as nitrogen levels cannot exceed 20 mg/L. It may be allowed in a non-community water system if the water supplier demonstrates all of the following requirements to the satisfaction of the department:

- A.** The water will not be available to children under the age of 6 months or any female who is or may become pregnant.
- B.** The water supplier meets the public notification requirements under NR 809.958, including continuous posting of the fact that nitrate as nitrogen levels exceeds 10 mg/L and the potential health effects of exposure.
- C.** Local and state public health authorities will be notified annually of nitrate as nitrogen levels that exceed 10mg/L
- D.** A supply of bacteriologically safe drinking water, containing less than 10mg/1 nitrate as nitrogen, is provided for infants less than 6 months of age and any female who is or may become pregnant.
- E.** No adverse health effects will result

Many farmers are looking to maximize yields and profits which is where inexpensive nitrogen fertilizers are convenient to boost the growth of crop. Nitrogen is required in large amounts to avoid a deficiency in crop production and is responsible for exceptional development. Even though nitrogen fertilizers are great for farmers, there are many ways available that they can limit the amount of nitrogen accessing our fresh groundwater, lakes, and streams.

See Ya Soon *Todd*

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FATBERGS

I hope none of you ever have to encounter a fatberg. If you do, remain calm and do not panic.

By Tony Roche

Every now and then, tales of what lurk beneath in sewer systems are brought to the surface. I am not talking about crocodiles or super villains like “The Penguin” (played by Danny Devito), today I am talking about amorphous blobs that wreak havoc underneath our streets: Fatbergs.

To those in the audience that have never heard of a fatberg, let me fill you in. Fatbergs are massive conglomerations of FOG (fats, oils, grease) and non-biodegradable matter such as rags and so-called “flushable wipes”. Fatbergs form when liquid FOG enters sewer systems and eventually cools and hardens. FOG can act like an amoeba and surround matter like rags and wipes, and as the FOG cools it can retain this matter. As more FOG and non-biodegradable matter accumulate over time, giant masses called fatbergs can form. To give an example of how truly massive these fatbergs can become, an epic fatberg in London was discovered in 2017. The staggering fatberg weighed in at over 100 tons and stretched for over 800 feet!

There are significant contributors to the fatberg problem. On the residential side, FOG is sometimes carelessly dumped down the kitchen sink, and often times the perpetrators of the dumping incidents do not know they are doing any harm to the sanitary sewer collection system. In commercial settings, kitchens with undersized or faulty grease traps and uninformed staff members can contribute significant FOG loadings to a sewer system. Industry can also be a significant catalyst to fatberg creation. In my experience as a wastewater operator, I have witnessed peppermint scented accumulations of FOG

conglomerating in lift stations. We had a candy factory in town, and since they manufactured peppermint flavored candies, it was kind of a no-brainer to figure out the source of the peppermint FOG...

Fatbergs can cause nightmares for collection system and wastewater treatment plant operators alike. Force main clogs, lift station pump failures, blinded-out bar screens, and collection system capacity reductions are just a taste of the troubles that fatbergs can bring. In addition, wasted energy (from pumping) and additional labor costs make fatbergs a costly foe to deal with.

However, there are some ways to mitigate and prevent the formation of abominations known as fatbergs. Public education is a tough task for sewer utilities to undertake, but nonetheless, an informed public can make a difference. Another avenue to combat fatbergs is through sewer use ordinance development and enforcement. If your sewer utility does not have an ordinance restricting FOG discharges to sewer...get one! These ordinances can provide legal backing and give the sewer utility some teeth to protect against what should not be flushed down the drain. Some sewer utilities also have active FOG management programs where problem areas (e.g. industrial parks) have been identified, and sewer utility staff actively monitor industrial grease trap cleaning and maintenance in these areas.

I hope none of you ever have to encounter a fatberg. If you do, remain calm and do not panic. Remember, stay safe and sanitized out there.

Take care. *Tony*

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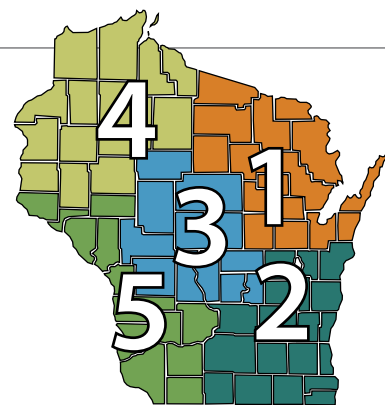
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 **Middle River Health & Rehab
 Center
 Milltown
 Minong
 Montreal
 New Auburn
 New Richmond
 North Hudson
 **Northwood School District
 Oliver
 Osceola
 Park Falls
 Phillips
 **Pleasant Valley Properties of WI,
 LLC
 Port Wing Sanitary District
 Prentice
 **Primera Foods Corporation
 Radisson
 Red Cliff North
 Rice Lake
 *River Falls
 Roberts
 **S&J Wild River Mobile Home Park
 St. Croix Falls
 Saxon Sanitary District #1
 Sheldon
 Shell Lake
 Siren
 Solon Springs WWTF
 Somerset
 Spooner
 Spring Valley
 Stanley
 Star Prairie
 Stone Lake Sanitary District
 **Stresau Lab Inc
 *Superior
 **T.A.P. Investments

continued on page 22

*Associate Members (Over 10,000 pop.) **Other Than Municipal

continued from page 21

Tony
Trade Lake
**Troy Glen Court
Turtle Lake
Washburn
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Weyerhaeuser
Wheeler
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**Willow Lane Mobile Home Park
Winter
**Wisconsin Structural Steel
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La Farge
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Lincoln Sanitary District #1
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Lone Rock
Maiden Rock
**Marell Mobile Home Courts
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**School District of Alma
**School District of Mondovi
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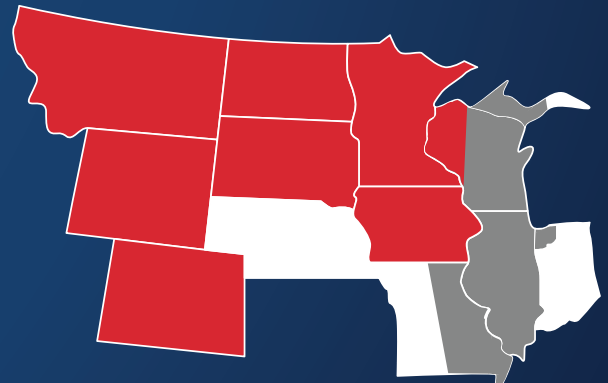
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Wellhead Protection Area Delineation



Andrew Aslesen,
WRWA Source Water Specialist

WRWA can develop a small local scale model specific to the municipal wells for which a wellhead protection plan is being developed.

In an effort to create a greater understanding of the wellhead protection process, I've decided to do a series of articles describing different parts of the wellhead protection planning process. I want to start with the wellhead protection areas since delineating them is probably the most technical part of the process.

A wellhead protection area is used to clearly define the land area surrounding a municipal well which is most important for protecting the groundwater serving as the municipalities drinking water supply.

The Safe Drinking Water Act of 1974 defines a wellhead protection area as "the surface and subsurface area surrounding a water well or well field supplying a public water system, through which contaminants are reasonably likely to move towards and reach such water or well field". The Wisconsin DNR lays out the requirement for wellhead protection planning in NR 811.12(6), including requirements for delineating the wellhead protection area. Wellhead protection areas are based at a minimum on the 5-year groundwater travel time to the well, with a minimum distance of 1,200 feet. The DNR has agreed that the 1,200 foot minimum distance can be reduced to 600 feet in areas where groundwater models are used to delineate the 5-year time of travel.

The 5-year time of travel to a well is also known as the "capture zone". Since a wellhead protection area is based on the 5-year capture zone, accurate delineation of the capture zone is an important step. There are several methods that can be used, with the simplest being a calculated fixed radius. A calculated fixed radius method estimates the circular area around a well through which groundwater will travel to the well within 5-years' time. The area is based on the porosity of the aquifer, well pumping rate and screened interval of the well. Due to its simplistic nature and that it does not take into consideration the direction of groundwater flow, the calculated fixed radius is not the preferred method for most situations. The best applications for this method are areas with thick aquifers where the aquifer material has uniform grain size porosity, known as "homogeneous". An example of this would be the thick Cambrian Sandstone aquifer in the southern part of the state.



The next option for delineating a capture zone is to use the uniform flow equation. This method uses a volumetric calculation to estimate steady state groundwater flow boundaries in the down gradient and side gradient distances. Once flow boundaries are calculated they can be applied along a direct groundwater flow path to the well to get the entire zone of contribution. The 5-year capture zone can then be determined using a second calculation of groundwater velocity along the groundwater flow path. The resulting area is a more elongated capture zone that extends further in the up-gradient direction and less distance in the down-gradient direction. This method is better than a calculated fixed radius since groundwater flow direction and hydraulic gradient are taken into consideration.

In most situations, the best option for delineating a wellhead protection area by using a groundwater flow model. A groundwater flow model utilizes a computer program to create a mathematical representation of groundwater flow in an aquifer. Groundwater flow modeling begins

by gathering as much data about the groundwater flow system as possible. This includes water table elevation measurements, surface water elevations, groundwater recharge and aquifer characteristics. For some areas, state agencies have developed regional or county scale groundwater models that can be used to estimate capture zones for municipal wells. For other areas, WRWA can develop a small local scale model specific to the municipal wells for which a wellhead protection plan is being developed. It's important to remember that groundwater models are representations of groundwater flow and are not exact; nevertheless, they provide the most detailed information and typically the best estimation of where groundwater pumped from a well originates from. A vast majority of the wellhead protection plans that we write use groundwater flow models to delineate the 5-year capture zones and establish the wellhead protection areas. If you have any questions about groundwater modeling or wellhead protection, feel free to reach out to me. *Andrew*

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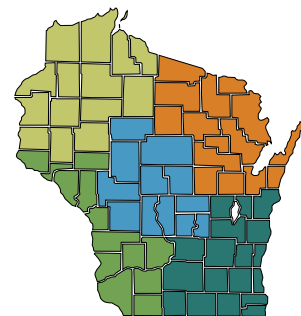
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WINTERIZING AND MAINTAINING WATER HYDRANTS



Jeff LaBelle,
WRWA Technical Assistance Director

I was driving through Northern Wisconsin thinking of what to do for this article, when I noticed that the leaves were changing color. This got me thinking of what needed to be done before winter set in. What I am talking about? Last of the fishing in open water, bear, deer, grouse, geese, duck hunting and any other things I would like to do. Maybe Chris would let me take the month of October off to get ready for winter! Well I'm sure I must have been day dreaming.

Hydrants need annual operation and maintenance if they are to operate properly when needed. When a hydrant turns hard, there are a couple of reasons for this. One reason could be that the shaft is bent. This would require the replacement of the shaft. To replace the shaft, you will need the information on the hydrant, bury depth, traffic flange, year of manufacture, size. The other and most likely reason for a hard to turn hydrant is in the bonnet area of the hydrant. The grease could be hardened, oil gone, anti-wear washer under the operating nut could be worn out. When flushing a fire hydrant, is the time to do inspections. If a hydrant turns hard, remove the bonnet (This can be done without shutting off the water on newer style hydrants) inspect the threads, if the threads appear black or the grease looks hard it is time to do maintenance on the hydrant. Remove the operating nut, oil/grease reservoir if so equipped, exposing the threads. Take a die and run down the threads and inside the nuts, cleaning them out.

Regrease the threads with an approved grease and reassemble the upper unit. Replace the o-rings in the oil reservoir and replace oil with approved oil. Along with the o rings on the oil reservoir all other o rings and gaskets should be replaced.

Hydrants need annual operation and maintenance if they are to operate properly when needed.

Reassemble bonnet and flush to test. The caps and threads on a hydrant also need to be maintained. Remove the caps, wire brush the threads and lightly grease using approved grease. When replacing the caps do not over tighten. Most times on the newer hydrants you have to add oil to the reservoir. To add oil either, remove the screw in the top of the operating nut, turn nut 1+ revolution and add oil or remove set screw on back of bonnet and add oil. When adding oil if a dark spot appears on the side of the hydrant, it has been over filled or is a grease reservoir. The next thing to look for is if water is bubbling up around the hydrant. If this occurs the problem usually is a faulty drain valve or cross arm problem. Leaking main seals can fill a hydrant and cause freezing in winter. When either of these is the problem you will have to remove the shaft to get to the valve assemble. This will require taking the hydrant out of service, shutting off the water to the hydrant and removing the shaft assembly, and replacing the required parts. Note problems with the lower parts and set aside time for repairs as these will take some time. Have a list of hydrants that do not drain; some are plugged from factory and need to be pumped. The factory plugged hydrants should have a tag on them indicating this. Keep some food grade antifreeze (RV) on hand to keep leaking hydrants from freezing when found during winter and plan for fixing in spring.

Give us a call at Rural Water if you would like assistance with hydrant repairs. We will be more than happy to help train personnel to do these jobs. *Jeff*



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UP THE CREEK



Ken Blomberg,
WRWA past Executive Director

"Gotta eat, or you're gonna die!"

That is exactly what the old man wielding a full shopping cart and a large smile exclaimed as we came face-to-face at the local grocery store.

When you are on top of nature's food chain, you hold all the cards. Humans have the ability to pick and choose what they eat and from the beginning of time, that included meat, vegetables and fruit. Every time we eat, something has to die. Even true vegetarians are ultimately responsible for the death of thousands of insects - both crawling and flying - as well as small mammals and nesting birds, which die each time heavy farm equipment plows, plants and harvests. That is the price we pay to produce the food we eat - the price we pay to survive. "Gotta eat, or you're gonna die!"

Humans raise livestock and grow crops to fill a craving for fast food, slow food and everything in-between. Some folks are attached by umbilical cord to grocery stores and restaurants. Others hunt, fish and gather to contribute to the dinner table. Our family does both. A good portion of what our boys were weaned on was venison, game birds and fish. Now that they are all but on their own, their personal refrigerators and freezers are full of wild fish and game.

Personally, I love to eat - and about every four to five hours, my furnace cries out to be fed. When you are on the peak of nature's food chain, you control your own dietary destiny. Only once did the role of sitting on top slip into neutral for me, as I gazed into the eyes of a mother black bear, while she and her cubs came out of winter's hibernation. Luckily, her winter slumber still controlled her mobility and I walked away in one piece with a couple of pictures and a head full of memories.

Our need to eat pales in comparison to the drive wildlife has to feed. Our freeloading songbirds visit the feeders non-stop throughout the day. Deer emerge from the woods several times a day - while chewing their cud - to graze for hours in our soybean food plot. Waterfowl on the neighbor's backwater slough seem to dabble and consume aquatic vegetation

and acorns from dawn to dusk. The only creatures that appear to pause between bites are the four-legged and winged predators - on a constant prow for their next meal.

Creatures of the wild survive from day to day, hour by hour and minute by minute following three simple rules - sleep, eat and procreate. In addition, they are constantly on the alert for danger and continually eyeing their human neighbors. Have you ever pondered on the multitude of perils wildlife face? Life expectancy for wild animals is short and just making it through a typical day can be difficult.

Like young rabbits, potential victims of an owl's wrath while dancing on the lawn in the moonlight. Or, neighbor Larry's sandhill cranes, who together, stand lonely in the mowed hay field, chickless after two disastrous summers. At least three, maybe four young chicks were lost to predators over the course of two breeding seasons. Ground nesting birds of all stripes, like ruffed grouse, woodcock, killdeer and mallards face immense challenges surviving nesting and brooding seasons.

Last summer, I noticed a shortage of turkey broods around our place. Hungry predators take out nests and young of the year - and once again, a family of fishers and several packs of coyotes have been active in the neighborhood. Last spring, I spotted a large fisher with a turkey egg in his mouth running along the edge of a cornfield. He stopped long enough to show off his prize and then hightailed it to the den to feed its young. On the whole, there still is a large population of turkeys. Just imagine, without the presence of predators, we would be up to our eyeballs in toms and hens.

Such is the balance of nature and as the saying goes, "Gotta eat, or you're gonna die!"

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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The **City of Fond du Lac** is accepting applications for the position of **Plumbing/Heating Inspector** in the Community Development Department. This full-time position reports directly to the Chief Inspector and will perform inspections of new and reconstructed plumbing installations, sewer connections, wells, and related installations; and provide information and assistance to contractors and homeowners regarding plumbing codes and other regulations.

Essential duties and responsibilities include:

- Conduct rough in and final inspections of new construction and reconstruction of industrial, commercial, and residential plumbing system installations within the City; inspect connections with main sewer to ensure connections are made properly; inspect and test building sewers and building drains.
- Perform plan reviews for proposed plumbing and sewer installations for compliance with State and other codes and regulations; provide information to contractors, designers and owners regarding recent code interpretations; provide various informational materials as appropriate.
- Assist engineers and property owners regarding clear water separation; issue orders for the separation of sanitary and storm sewers; inspect corrected connections for compliance with order.
- Investigate sewer backups to determine cause of problems and take appropriate action.
- Inspect heating systems to ensure compliance with State codes.
- Provide information and assistance to homeowners regarding plumbing installations by providing code and consultation services.
- Inspect air and water tests of water mains and sanitary mains under roads and terraces for private developments.
- Inspect private wells as required to obtain well permit.
- Provide assistance in updating local plumbing ordinance.
- Other duties as assigned.

Requirements include technical training in plumbing and heating systems, and six to nine years plumbing experience, or any combination of education and experience that provides equivalent knowledge, skills, and abilities. Must possess ability to operate a variety of plumbing tools and equipment including level and transit, air and water testing equipment, etc. Must be a Certified Master

Plumber or Journeyman Plumber with the ability to obtain a Master within 3 months of hire. Must obtain a Commercial Plumbing Inspector and UDC HVAC Inspector credential. Additional Inspector credentials are encouraged. Excellent computer skills as well as interpersonal skills, communication skills, public speaking skills, and the ability to work effectively with citizens, developers and contractors highly recommended. Multi-lingual a plus.

The City of Fond du Lac offers a comprehensive benefit package including health insurance, life insurance, and Wisconsin Retirement. The salary range is \$58,000 - \$71,616 based upon qualifications and experience.

Please submit a completed application and resume describing your experience as it relates directly to this position along with copies of required certifications. Open until filled. You may obtain application materials by contacting City Human Resources at (920) 322-3624 or visiting <https://www.fdl.wi.gov/employment.iml>. EOE

The **City of Fond du Lac** is accepting applications for the position of **Senior Network/Security Engineer** in the Information Technology Services Department. This full-time position reports directly to the Director – ITS, and will be responsible for the overall management of a medium-size enterprise network; this includes the planning, design, 24x7 management, configuration, and coordination of the corporate LAN/WAN. This position also manages network security and policies.

The Senior Network Engineer must be able to work effectively and efficiently in a fast-paced office environment in meeting deadlines. The Senior Network Engineer must be able to handle multiple priorities combined with frequent interruptions. Organizational skills are essential, and a sense of urgency, the ability to make good decisions, and the prioritization of tasks are necessary.

Essential duties and responsibilities include:

- Assess and evaluate current network computing infrastructure.
- Configure, support, and maintain/manage core network switches/routers as well as all internet access circuits/components.
- Design, configure, implement, install, maintain, upgrade, and monitor the status for the following components of the network and infrastructure:
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 - Enterprise-level Active Directory internal and external DNS configuration
 - Wide Area Network (WAN) connections
 - Enterprise-level internet access circuits via external Tier1 and Tier2 providers
 - Public and private corporate wireless networks via WLC/WCS
 - Remote Access Virtual Private Network systems
 - Voice data systems
 - Network systems diagrams and documentation
 - Surveillance camera systems
 - Security certificates for SSL encryption
 - VMWare virtual network infrastructure

- Manage network and data projects, including site remodels for networks and phones, secure bids for equipment, and manage timelines and implementation/installation.
- Detect, identify, and perform problem isolation and resolution throughout the network architecture.
- Utilize monitoring, mapping, and alerting software to perform network management by proactively collecting data and conducting real-time analysis on the performance of the network.
- Evaluate software and hardware lifecycles, set project timelines for implementation.
- Conduct research, evaluate, and recommend cost-effective network solutions and new technologies to support the technology strategies of the core business
- Execute contingency plans for network software and hardware failures including isolated and major outages
- Provide personnel training; create & enhance process documents. Keep abreast of emerging technology trends.
- Implement and support network security procedures.
- Identify and correct faults and provide a resolution of complex problem tickets as well as document troubleshooting steps for future reference

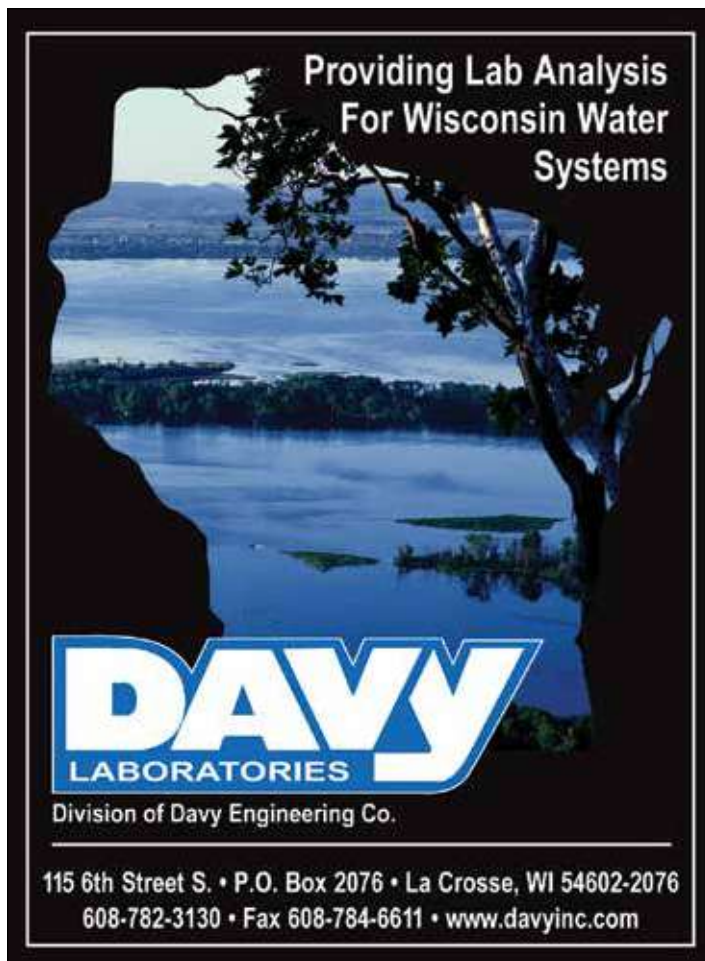
- Provide project management, project scoping, troubleshooting, problem resolution, documentation and customer management skills.
- Maintain and document the city-owned fiber assets.

Requirements include a 2-4-year degree in Computer Science or a related field and have had at least 5 years working as a Network Engineer or related position in the Information Technology field. Preferred certifications are one or more of the following: CCNA, CCNP, CISSP, CISM, CEH, GIAC, or related certifications, or a combination of diverse education and experience in the field of Networking and Security.

The City of Fond du Lac offers a comprehensive benefit package including health insurance, life insurance, and Wisconsin Retirement. The salary range is \$68,000 - \$78,000 based upon qualifications and experience.

If you are interested in this excellent opportunity, please submit a completed application and resume describing your experience as it relates directly to this position along with copies of required certifications. Open until filled. You may obtain a job description, and the application materials by contacting City Human Resources at (920) 322-3624 or visiting: <https://www.fdl.wi.gov/hr/senior-network-security-engineer/> EOE

continued on page 36



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City of Watertown Water Utility is seeking qualified applicants for a full-time **Water Distribution Crew Leader**. This position's duties involve responsibility for all the asset management, maintenance and repair of the entire drinking water network of pipes, valves, hydrants, water storage structures, and water services. Essential duties of the job include all aspects to deliver safe drinking water from source to tap. The position is responsible for a team of four crew members and coordination of all the field work based on planning, and scheduling for the Water Distribution Crew Team. The position is responsible for the systems source water storage system, and for ensuring the safe and efficient operation of the system. Must also perform a variety of manual, monitoring, testing and reporting functions to ensure proper operation of a water supply system in accordance with State and Federal drinking water standards.

The Crew Leader must be capable of leading and supervising the team to address problems and implement solutions before they adversely impact the quality of water produced, and exercise considerable independence of judgment to working with the other crew members. While much of the work may be routine in nature, the Crew Leader must be constantly alert to and aware of the operating conditions of various equipment such as pumps, motors, chemicals, traffic, heavy equipment, instruments, valves, meters, etc. The Crew Leader is responsible directing and supervising all field work required for the crew technicians. The Crew Leader will also schedule and coordinate necessary technical training for the other crew members. Willingness to receive and respond to emergency call-outs.

Employee must maintain State of Wisconsin DNR Grade 1 Waterworks Groundwater and Distribution certifications. This employee will also fill in and schedule the team on a rotating basis for water operations, maintenance, water meter and customer service jobs. This position will share in the weekend and holiday on-call and water system operations schedule which include drinking water lab testing and as such performs the duties of other positions as assigned.

This is a full-time hourly position with current normal work hours from 7 am to 3 pm Monday – Friday with a weekend rotation schedule.

Starting compensation is \$27.84 to \$30.93, DOQ.

Applications available at City of Watertown or online:
www.ci.watertown.wi.us

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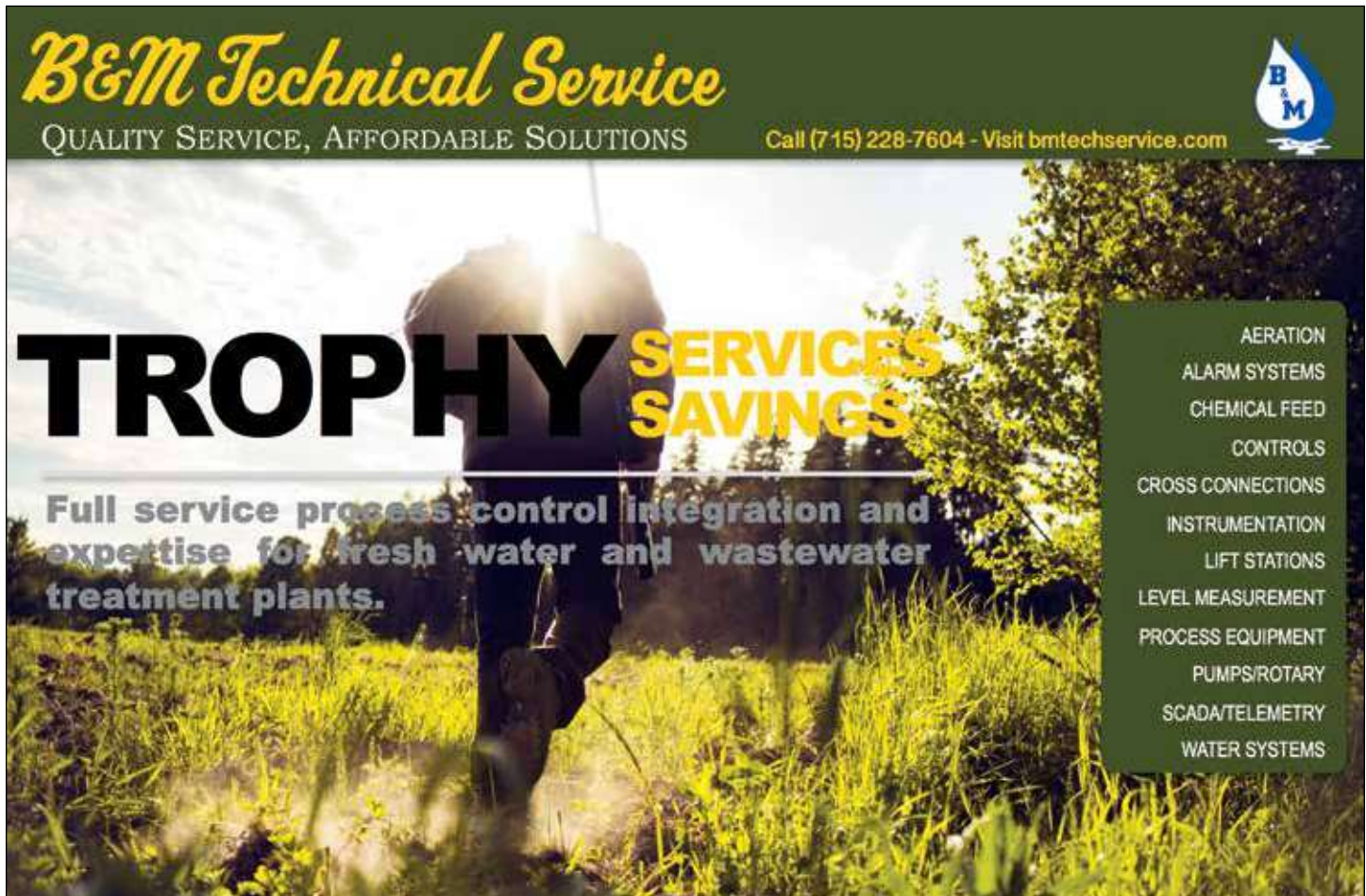
Email complete packets or questions to apply@cityofwatertown.org

Application Deadline: Friday 4pm, October 16, 2020

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Manitowoc Public Utilities (MPU) is seeking applications for **Water Production/Maintenance Foreman**.

The Water Production/Maintenance Foreman performs all duties relating to the maintenance of the Water Treatment Plant. The duties



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shall include work on the MPU system, as well as other operation and maintenance contracts. This is a working position that assists in the direction, supervision, training, performance, and coordination of the maintenance of the water treatment plant. This position includes physical labor in all weather, and the use of tools and equipment for day-to-day duties. Direct supervision will be by the Water Production Superintendent.

Minimum qualifications include a 2-year associate degree and possession of a WDNR Operator Certification in Groundwater, Distribution, or Surface Water.

MPU offers competitive wages and excellent benefits program including the Wisconsin Retirement System. A valid Wisconsin driver's license required for all position. MPU does not discriminate on the basis of race, religion, sex, national origin, disability, sexual orientation, or any other protected class. Send applications or resumes to MPU, Attn: Carissa Grimm. Applications available online at www.mpu.org.

Due to a recent position opening, the **Village of Wrightstown Department of Public Works and Utilities** is accepting applications for the position of **Wastewater Operator / Public Works Laborer**. The primary job duties for this position include serving as the wastewater system operator. Secondary responsibilities will include assisting in water system operations and public works operations as needed. Other duties include but not limited to plowing snow, operating and maintaining various pumps, motors, and equipment

within the department. The successful candidate will be required to respond to infrastructure emergencies and be put on the weekly on-call rotation, which includes scheduled weekends and holidays. The candidate will possess a valid Wisconsin CDL or the ability to obtain one within six months from hire. This position has a twelve-month probationary period. The Village offers a competitive starting wage ranging from \$22.45-\$23.35/hour, a comprehensive benefit package including; medical benefit plan, Wisconsin Retirement Plan, deferred compensation, life insurance, voluntary dental and vision plan, paid holidays, vacations and sick leave. Scheduled working hours are Monday-Friday 7am to 3:30pm for Fall/Winter and 6am-3:30pm Monday-Thursday and 7am-11am on Fridays during the Summer.

Five years of quality experience in the water, wastewater, or maintenance fields, a job related to the public works and utilities and /or an Associate Degree in Wastewater Technology desired but not required. Qualifications for this position include having, or the ability to obtain Wisconsin advanced wastewater certification with subclass A1, C, P, D, L, and B. Residential inspection experience is also desired but not required.

Applications and a complete job description can be obtained from Village Hall at 352 High St., Wrightstown, WI. 54180, phone 920-532-5567, or by visiting: wrightstown.us Please submit your completed application and resume by 12:00 p.m. on Friday October 16th, 2020 to Village Clerk, Village of Wrightstown, 352 High St., Wrightstown, WI. 54180.

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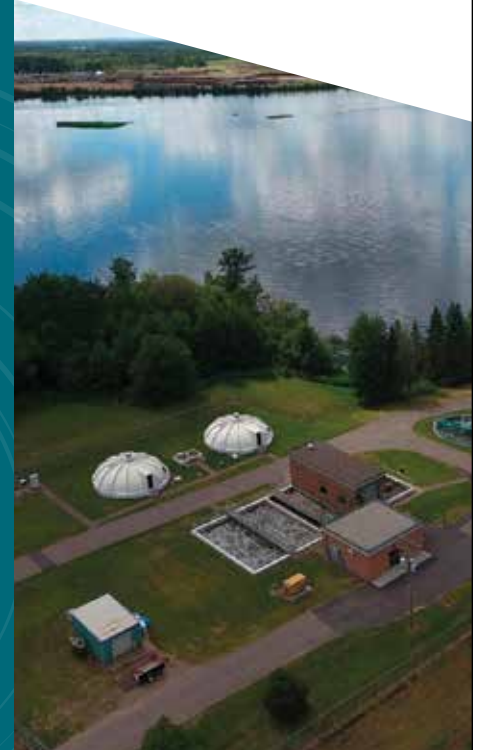
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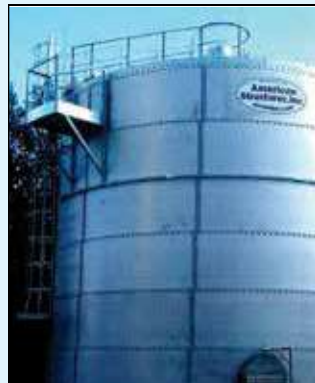
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Delta 3 Engineering, Inc.....	39	Short Elliott Hendrickson.....	17, 25
Dixon Engineering, Inc.....	5, 38	Staab Construction Corporation.....	41
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Drydon Equipment.....	40	Suburban Laboratories.....	42
Energenecs.....	13	SunCoast Learning Systems.....	44
ETNA.....	19	SUEZ.....	31, 39
Ferguson Waterworks.....	13	Symbiont.....	41
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