Fact, Fallacy, Flint

What happened in Michigan, what didn’t, and what we can all learn from the experience

Inside:
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Chlorine Gas Disinfection
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Visit us at [www.mnawwwa.org](http://www.mnawwwa.org)
Message from the Chair

Winter in Minnesota

Ok, what happened to our winter! Why can’t we have the good old-fashioned winter that everyone wants? Snow and cold.

Please plan to attend the Water for People Benefit Concert on Saturday, April 30, 2016, at Bogart’s in Apple Valley. It was a blast last year, and “Big Bob and the High Rollers” will be the band again this year.

Our section water schools are coming up; please plan on attending and supporting them. For class dates and locations, please check our website (www.mnawwa.org); we regularly post information there as we receive it from our members.

Our centennial celebration events are coming together. Make plans now to attend our annual conference in Duluth, MN (Tuesday, September 20 through Friday, September 23).

Congratulations to Glen Gerads and the Minneapolis Water Treatment and Distribution Services Division for being selected as the recipient of the AWWA 2016 Diversity Award.

To all Council Chairs, committees, and members, thank you for your dedication, time, and talents. This is what makes our section work!

As I write this, please keep the city of Bloomington Public Works Department in your thoughts and prayers. Remember we all want to return home at night. Always be aware and at all times protect yourself when working on the street.

One more thing . . .
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Honored to Represent Our Section and Association

The Fall Conference will culminate our centennial anniversary! Make sure to invite friends, retirees, new members, and coworkers to the celebration.

AWWA Board Meeting
In mid-January, the AWWA Board met to discuss business and operational plans, provide updates on various initiatives, approve policy statements and standards, approve award nominees, and elect new officers. The following are highlights from the meeting.

Elections
AWWA President-Elect will be Brenda Lennox; currently the Pacific Northwest Section Director and AWWA Vice-President. Brenda will be AWWA President in 2017–18.

AWWA Treasurer-Elect is Aurel Arnt; currently the Chair of the Water Utility Council. Aurel will be the AWWA Treasurer from June 2016 to June 2020.

AWWA Vice-Presidents are Kevin Bergschneider (Rocky Mountain Section), Mitch Kannenberg (South Dakota Section), Terry McGee (Illinois Section), and Jacqueline Torbert (Florida Section). Their terms formally begin after ACE16 in Chicago, and they will join Steve Dennis and me as the six Association VPs.

AWWA Director-At-Large will be Lindsey Olson (New Jersey Section). Her term formally begins after ACE16 in Chicago.

Awards
Congratulations to the city of Minneapolis for receiving the AWWA Diversity Award. The award, established in 2003, recognizes an individual or organization that has created, promoted, and maintained diversity within an organization by establishing an environment that recognizes, encourages, and effectively utilizes each individual’s talents.

Water For People
In January 2001, the AWWA Board of Directors approved a resolution to designate Water For People as AWWA’s “Charity of Choice.” Water For People, while founded by AWWA, is not legally part of AWWA. For a variety of reasons the designation is an important distinction to Water For People and an action in which the AWWA Board of Directors took great pride.

In 2014, the AWWA Board of Directors launched its own philanthropic program called The Water Equation. In support of AWWA’s vision and mission, The Water Equation supports AWWA programs targeting workforce issues, scholarships, community outreach (CE Corps) and global outreach (India).

At the January 2016 meeting, the Board voted to realign the resolution and articulate AWWA’s commitment to invest in the success of The Water Equation as AWWA’s philanthropic program, while reaffirming AWWA’s continuing support as a strong partner of Water For People.

Membership Model
AWWA’s membership structure was studied with the intent of simplifying the model while growing member value, count, and revenue from dues. After collecting and analyzing relevant data, and feedback by staff and volunteer stakeholders at both the Section and Association levels, the following changes were suggested and approved:

1. Eliminate the PlusPoints program as the device through which benefits are allocated for organizational members; and
2. Substitute a package of benefits per organizational grade that maximizes the offerings previously available under the PlusPoints program.

In addition to the approved changes, staff will simplify the membership nomenclature and invoicing/accounting between the organizational members and the Association.

Wisconsin Section
Formally changed its name from the “Wisconsin Water Association” to the “Wisconsin Section of the American Water Works Association” to better align with the Association branding strategic theme.

Washington Fly-In
On April 13 and 14, members from Sections and the Association will fly to Washington, DC, to meet with congressional members to discuss various water initiatives, attempt to fund WIFIA (the Water Infrastructure Finance and Innovation Act), and limit any reductions to State Revolving Funds (SRFs).

As always, if you have any questions about the Association, please contact me via email at jeaton@cityofeagan.com. I want to THANK the Minnesota Section for voting me as Director; and the Association Board for electing me as Vice-President. I am honored to represent our Section and Association. See you in Chicago at ACE2016! •
The water meter technology race is on. Ferguson Waterworks is out in front.

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If You Can’t Be a Good Example, at Least Be a Horrible Warning

Because of the solid professionals we have in our state, along with strong partnerships among these pros, Minnesota remains a good example. Through the years, the horrible warnings have happened elsewhere. Every time – from the Cryptosporidium situation in Milwaukee shortly after I started working at the Minnesota Department of Health (MDH) in 1993, to the recent issue with lead in the water in Flint, MI – it gives water professionals elsewhere the chance to look at their situations and make sure these things don’t happen on their watch.

Many of us in Minnesota have gotten questions in the past few weeks about how we are different from Flint, and what we are doing to protect our residents from lead in water.

What did or didn’t happen in Flint is complicated. Rick Wahlen has provided a good summary of the Flint situation for this issue of The Breeze. His insights are followed by the MDH perspective. A new fact sheet is on its website titled, Avoiding Lead Contamination in Minnesota. (You can find the link in the right-hand column at: www.health.state.mn.us/water).

The information and messages within this fact sheet were ones we used when responding to interview requests from Twin Cities television and radio stations as well as from newspapers ranging from the St. Cloud Times to the Minneapolis Star Tribune to the Wall Street Journal.

One of my comments to a reporter was, “In Flint, a lot of things went wrong. In Minnesota, we want to make sure that none of those things goes wrong.”

Optimize treatment, optimize corrosion control, protect the distribution system at all times. A water system might get lucky and not have a disastrous situation occur if something goes wrong. But providing a reliable supply of safe drinking water is never a matter of luck. Do all things right all the time.

Let’s stay as the good example rather than the horrible warning.

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Can the Flint, MI, water controversy be a timely example for infrastructure change, for reflection on our own operator training program, and our roles in public awareness about their forgotten water supplies?

I keep seeing news stories talking about the “corrosive river water” or that officials used “corrosive chemicals” and the change in chemicals “corroded the pipes,” which resulted in lead contamination in the taps of thousands of public water customers. As reported, these statements are not accurate and mislead the public. In my experience, reporters craft a story concerning public water only after consulting people who they believe to have some knowledge about the issue. Let’s face it, chemistry is not a core curriculum for a journalism degree. So, assuming these authors of news stories did their homework properly, including conducting interviews with water system officials, how are these inaccuracies still getting published?

It is so important that we as water professionals help guide the media to write their stories factually and correctly by explaining the facts using easy-to-understand terms, even giving them the appropriate words to use. Public water safety and drinking water chemistry is way too easily misunderstood by the media and reporting about drinking water issues deserves thoughtful and intentional guidance from all public water professionals.

Various news stories I’ve read also indicate that switching from Detroit water to the Flint River water treated by the city’s own water treatment plant was a concept somehow pushed upon the citizens by a seemingly greedy and corrupt state government that only wanted to save a buck. In 2013, the city council voted 7 to 1 to partner with the new Karagondi Water Authority (KWA) to save millions of dollars in purchased water costs. Their plan was to remain on Detroit water until a new KWA pipeline to Flint could be completed in 2016. What most news stories forget to tell us is that upon learning of Flint’s decision to disconnect service with Detroit in 2016, the Detroit Water and Sewer Department appealed to the state, trying to stop Flint from making a better deal for...
their water, and leaving Detroit with a $16 million annual loss in sales revenue. The state treasurer's office sided with Flint, but encouraged Detroit to make a counter-offer, which Detroit did. Water purchased from KWA was still a better deal, and Flint declined. Detroit responded by canceling its contract with Flint in just 12 months, leaving the city to find an alternative water source for the interim. The city council’s fiscally responsible decision to buy water from KWA left Flint without a drop to drink by April 17, 2014, thanks to Detroit's tactical counter-play, so the city had to do something to acquire water for at least two years from yet a third source.

Still, the switch from Detroit to KWA, even with the necessary upgrades in treatment, saved the city millions of dollars and prevented the council from having to raise water rates by 30%. In fact, the cost savings even allowed the city to finance much needed and overdue future water distribution repairs. Printed and television news reports suggest that the state appointed emergency manager trying to save money led to this problem in the first place. I disagree. This nightmarish incident did not occur because the Governor or the Emergency Manager was trying to be cheap, nor did it occur because the wrong water source was used. Flint’s bad drinking water occurred in part because of a calamitous series of events, not the least of which included: foregone valve repairs, routine water main flushing, and other preventative water system maintenance practices postponed years prior to the incident that are just as much the fault of a city unwilling or unable to prioritize the maintenance of its out-of-sight public water and sewer system. The degraded water distribution system did not get that way after the city fell into receivership in 2011, and the state took over its fiscal management. Flint’s bad drinking water also occurred because someone allowed the treated water chemistry to contribute to the breakdown of the water distribution system environment.

It is so important that we as water professionals help guide the media to write their stories factually and correctly by explaining the facts using easy-to-understand terms, even giving them appropriate words to use. Public water safety and drinking water chemistry is way too easily misunderstood by the media . . .

Those of us in the business know or should know that the chemicals used in water treatment do not “make” the drinking water more corrosive. Likewise, the drinking water taken from the Flint River itself is not more corrosive than drinking water taken from Lake Huron, unless it is not properly treated. When a drinking water treatment plant is between the raw water source and the consumers’ tap, the corrosivity of the raw water source is, for all practical purposes, an irrelevant factor. The treatment system is always designed to handle the source water challenges and provide a product that meets safe drinking water quality standards. Yes, it’s always the operators who have to experiment with process changes for months after a treatment plant starts-up to optimize the treatment train and work the bugs out, but the engineering design team is just as vested in that start-up process and just as concerned about a successful outcome. So why then is Flint’s source water brought up so often? A recent series of articles cite the high concentration of chloride in the raw water as one of the reasons the drinking water is corrosive and leaching lead into the tap water. Although it is true the chloride concentration found in the Flint
River is high – a rising problem in surface waters throughout the country due in substantial part to the runoff from road salt – the raw water is not what is flowing through the city’s mains. The raw water pumped from the river into the treatment plant is less stable in metal pipes than the wholesale treated water that had been purchased from Detroit for decades. What is most mysterious about Flint’s chain of events leading to lead contamination is how the treated water was allowed to be so much more corrosive than the previous water supply. In any public water system, long-term use of a water supply treated in a consistent and chemically stable manner creates an environmental equilibrium throughout the whole delivery system. When done properly it creates an environment within the water mains that achieves a stability which protects metallic pipes from internal corrosion. In Flint, the finished water purchased for years from the Detroit Water and Sewerage Department was treated and disinfected with chloramines, the pH of the plant effluent water was 7.9, it averaged 7.4 to 7.5 by the time it made out into the reaches of the distribution system, and that treated water was stabilized with a variant of orthophosphate, which slowly deposits a thin protective film on the pipes over many years. As we know in the public water profession, that protective film at the microscopic level separates the water from the pipe wall. After years of this water flowing through Flint’s pipes at a relatively stable temperature, stable pH, stable concentration of polyphosphate, and consistent chloramine disinfection dosage, Flint’s water system arrived at a very comfortable environmental equilibrium in which the water passing through the pipes no longer reacted with pipes that contain lead.

The city of Flint hired Lockwood, Andrews, and Newman Engineering to upgrade the city’s water treatment plant to meet the state effluent water quality standards. As discussed earlier, Detroit cutting them off early prompted a rapid transition to the Flint River. The finished design was a lime-softening plant with granular-activated carbon filtration. The Michigan Department of Environmental Quality (MDEQ) participated in the design and approved the plans and specifications, just as the Department of Health does in Minnesota. We have to conclude the plant was capable of effectively treating the raw water to pass the state design review. The engineer firm in partnership with the Department of Environmental Quality performed extensive raw-water quality studies and planned for those challenges, including high chloride levels, in the treatment plant design.

From available online monthly treatment plant reports, the effluent water pH was typically in the range of 7.6, but there were no records showing the dosage of any type of orthophosphate or polyphosphate. The complexity of the water treatment plant earned Michigan’s highest license requirement, so the person in direct responsible charge had to have held Michigan’s equivalent of our Class A water license. Judging from those I know in this profession in Minnesota and the Dakotas, a Class A operator would be very, very uncomfortable sending water into a very old distribution system without stabilization. And as we’ve learned, within a couple of weeks of switching water supplies, rusty water complaints began pouring in from all over town.

Further research of investigative reports indicates that the MDEQ decided that chemical stabilization would not be necessary during the first year of operation, and until two, consecutive six-month sampling periods were completed and evaluated, phosphates would not be incorporated in the treatment process. This is very curious, especially when rusty water complaints began so soon after the switch-over. Allegations exist that are yet unproven suggest chemical stabilization was not added as a cost-saving measure. For an agency trusted with public health to place a single community’s finances above proactive health protection, such a decision is completely out of character with their mission. Still, even if the MDEQ told the treatment plant operators that no phosphates were necessary, wouldn’t you think that would defy the operator’s own training and experience? Not being in a situation where our city government is under the temporary emergency management of the state makes a fair comparison hard, but I can’t help but wonder what our Class A operators would do if advised similarly by the state? Would you have the confidence in your own training and experience to question such advice?

We pride ourselves in this profession for being ongoing students of our science and masters of our craft. By virtue of the training and examination requirements to earn a water operator’s certification in Minnesota, a Class B water system operator knows the water chemistry concepts of lime softening, corrosivity, stabilization, and disinfection by-products; hopefully, through his years of experience, an operator understands what the treated water has to be like to not “tear-up” a stable drinking water environment. The years of direct, applicable operations experience required before becoming eligible to take the water operators exams are purposefully in regulation to give us the opportunity to gain the necessary experience to run such a plant. Did Flint have qualified, licensed operators at the helm? According to an FAQ document published by Flint, they had one F-1 (same as Class A)
operator at the plant who would be responsible for making sure the water chemistry was properly managed. No mention is made of other operators who may have had licenses. However, one must ask the question, “If the city had been purchasing water from Detroit for nearly 50 years, did the senior operator have the necessary experience at running a lime-softening plant to be put in charge of such a critical role?” Could a Minnesota Class A water operator find himself in direct responsible charge of a plant that he was not technically qualified to manage? This real-life case study serves as a reminder that we in Minnesota must do our part to ensure advanced water operator license holders are qualified through appropriate experience, practice, and current continuing education to make such process decisions. And to those who are striving for your next higher license, wouldn’t it be wise to seek out those jobs where you will get that increasingly responsible experience and thus prepare yourself for a time in the future when your license carries the weight of your city’s health?

A lot of concern is gathering nationwide from the fact that Flint has nearly 50% of its 32,000 service connections made of lead pipe, and that many other large cities have similar numbers. I also read on a blog and heard a radio program discuss the apparent protocol for Flint’s lead and copper sample collection, suggesting it was being “rigged” in favor of the utility, alleging that the samples were collected not from water that lay stagnant in the pipes overnight, but from kitchen faucets that were flushed for several minutes before the sample was taken. Sadly, this kind of distrust in the public water system inevitably erupts after mistakes are made, when boil-water notices are issued, and when people all of a sudden feel they have to pay attention to the water to be safe. Reporting like this stirs up anxiety and creates public fear. With all the distrust of government, the public is generally not aware of the integrity instilled in the public water profession, nor do they know about the culture of honest and ethical water quality management among public water operators. More than ever, we must continue to ethically protect public water safety and meet our media partners head-on with the truth to build trust among our communities.

So when all is said and done, just how do we help the media get it right? As water professionals, we need to be mindful of how we communicate with our friends in the news media. We need to know our craft, and we need to talk about it in such a way that does not lead to misunderstanding by the reporters. Be factual, be succinct, and be consistent in your theme. Tell the media what you are going to tell them, tell them what needs to be said, and then tell them what you just told them. In this example at Flint, news stories suggesting that changing the water source to river water is responsible for lead poisoning or that water treatment chemicals are responsible for pipe corrosion, or that a public administration official is responsible for the quality of the tap water are very good examples of what happens when stories are written without our partnership and support.

The drama in Flint is growing each day. I encourage each of you to pay attention to the details of this ethical case study and look for opportunities in your own...
community to partner in a positive and truthful relationship with the media to build trust among your public. Spend time during quiet times to help craft good news stories about your public services. Build that trusting partnership now so you won’t be thought of as a government official who is hiding the ball when something controversial happens. When bad things happen, the story will always be published. You can’t stop it. You might as well join the effort and make sure the facts at least get a voice. Otherwise, emotion and opinion will steer the story, and you can see what the outcome is like when that happens.


Minnesota Department of Health Perspective:

Water systems have been involved in monitoring water within households since the implementation of the federal Lead and Copper Rule in the early 1990s. Lead is unusual among waterborne contaminants in that it is rarely present in water at its source. Instead, it works its way into water on the way to people’s faucets through the home. Lead in a water system’s distribution pipes can dissolve into the water as it passes through. Lead service lines, connecting water mains to people’s houses, is another source. Inside the home, lead pipes and solder may contribute to lead contamination, especially since water often sits idle in these pipes while families are asleep or away from home at work and school.

While Minnesota’s communities have had relatively few issues with lead contamination, a number of U.S. cities have had prominent lead contamination problems in recent years.

Problems Elsewhere

A change in chemical treatment had a major effect in Washington, DC, in the early 2000s, causing corrosion in pipes and the subsequent discovery of lead levels in the city at least 83 times higher than the action level of 15 parts per billion. The issue was addressed with corrosion-control treatments to the water to prevent the leaching of lead in water from mains and fixtures, although problems have continued.

In 2014 the city of Flint, MI, temporarily switched its water source from Lake Huron, supplied by the Detroit Water and Sewerage Department, to the Flint River, an inland source that can cause greater challenges in treatment than water from the Great Lakes. Flint treated the river water to make it safe, but the water reaching people’s homes was corrosive. Water that’s corrosive can allow water in lead service lines – which connect water mains to household plumbing – to absorb lead from the lead service lines and plumbing. The result can be significantly higher levels of lead in the water that people drink.

The Situation in Minnesota

In Minnesota, if a water system goes to a different source of water, even a new well, Minnesota Department of Health engineers will review the plans for treating the water and also examine corrosion-control methods that could be necessary to ensure that the water does not absorb materials such as lead and copper from pipes in the distribution system.

To avoid unintended consequences from source or treatment changes, any such changes by a water system require review and approval from the Minnesota Department of Health before they take effect; often, pilot studies are required as part of the review and approval. A new source of water and/or treatment change also brings about changes in the monitoring frequency required for the system for examining lead levels in the water.

MDH engineers also review water quality reports, which follow each round of sampling by a system. Based on these reports, engineers may issue recommendations to address any possibility that the water has the potential to absorb materials, which could include lead, from water mains, service connections between the water mains and homes, and household plumbing.

In addition, MDH has a statewide system for laboratories to report blood-lead levels in patients; such reporting could trigger an immediate visit from a nurse. Lead can come from many sources besides water, and the biggest threat in Minnesota continues to be the nearly one million homes in the state that contain lead paint.

Minnesota’s service connection fee (collected by water systems from customers and passed on to the Minnesota Department of Health) assists in MDH’s ability to promptly respond to drinking water quality issues across the state. The Health Department is able to see the sampling results before the water systems do; if there is a problem, MDH notifies the system, which can quickly begin corrective actions. Many states do it the opposite way: testing and data collection are done locally and reported to the state. The method in Minnesota allows for another early-warning system for contaminants in drinking water.

Any system in exceedance of the action level for lead must, among its corrective actions, provide ongoing public education to its customers.
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Plant Managers across the country are faced with complex safety requirements in the operation of a water treatment plant. Heightened U.S. Environmental Protection Agency (EPA) requirements are expected when chlorine gas is used as a disinfectant because chlorine is designated as an Extremely Hazardous Substance (EHS) as defined in 40 CFR Part 355. Certain emergency planning activities known as Risk Management Studies (RMP) are also required by federal and many state agencies when chlorine is stored above a certain threshold quantity (TQ). Additionally, the method of storing chlorine will influence the scope and extent of the emergency plan preparation that is required by the RPM regulations. This article discusses the impact of total containment on the preparation of federal RPM studies. It is recommended that state and local regulations be reviewed when preparing emergency plan preparations for additional requirements.

The water treatment industry uses two techniques for the control of chlorine leaks. These are scrubbing or containment.

• Scrubbing is a treatment system that neutralizes the accidental release of chlorine gas by drawing contaminated air through a chemical absorption system. The treated air is discharged to the atmosphere.

• Containment systems employ a self-contained vessel within which the chlorine gas cylinder is housed. Accidental leaks of chlorine are kept within the containment vessel, an ASME-rated pressure tank, for recycling to the injection system at a normal flow rate. No atmospheric venting is generated because the leaked gas is kept within the containment vessel. TGO Technologies, Inc. of Santa Rosa, California, has developed self-containment vessels for both 150-pound and one-ton cylinders that perform this function and keep our communities safe. See photo.

Both scrubbing and containment technologies for chlorine gas are subject to the requirement of an RMP, as stipulated in Section 112(r) of the Clean Air Act and Article 80 of the Uniform Fire Code. In Section 112 (r), the EPA developed a list of 77 toxic and 63 flammable substances for which TQs were established. The TQ for chlorine is 2,500 pounds. Facilities storing chlorine gas in quantities that equal, or exceed 2,500 pounds are required by statute to prepare an RMP in accordance with 40 CFR Part 68, Subpart G.

It is important for plant managers to accurately inventory the quantities of stored chlorine gas cylinders at the plant site. Stored quantities of less than 2,500 pounds do not trigger the preparation of a federal RMP, an activity that requires significant administrative time and effort which diverts scarce resources from plant operation and system monitoring.

A further consideration when determining whether a facility must prepare an RMP is the method used to control chlorine leaks. A self-contained, total containment vessel of the type available from TGO Technologies, as described above, is considered a separate process if not manifolded or interconnected to other vessels. That is, a single, unconnected 1-ton cylinder housed in a total containment vessel would be below the exempt TQ of 2,500 pounds and an RMP would not be required. Up to 16 150-pound gas cylinders may be interconnected and not meet the TQ of 2,500 pounds (i.e., 150x16 = 2,400 pounds). However, the manifolding of a 17th 150-pound cylinder triggers the requirement for a federal RMP. It is recommended that treatment facilities review their gas chlorine system storage and delivery designs to determine if these designs can be modified to separate, currently connected 1-ton cylinders, resulting in a stored quantity of 2,000 pounds, a quantity below the threshold 2,500-pound TQ amount, and thereby avoid the preparation of an RMP.

We have been discussing the specific TQ amounts that trigger the preparation of a federal RMP as presented in Section 112 (r) of the Clean Air Act. The use and storage of gaseous chlorine triggers other safety and reporting requirements as mandated by the Emergency Planning and Community Right to Know Act, the
Plant managers across the country are faced with complex safety requirements in the operation of a water treatment plant. Comprehensive Environmental Response, Compensation and Liability Act and others such as OSHA’s Section 1910.119 that must be prepared by the facility. We also note that State RMP TQs may be more stringent than the federal regulation identified in Section 112 (r); for example, California’s TQ for chlorine is only 100 pounds. It is strongly recommended that your state’s TQ requirements for chlorine be checked when assessing the need to perform an RMP.

In conclusion, the TQ for conducting a federal RMP Study for chlorine gas is 2,500 pounds. If a water treatment facility has multiple one-ton chlorine cylinders, and each is enclosed within a total containment vessel designed to withstand any release of chlorine, and if they are not interconnected, each is considered to be a separate process. This will allow the separate vessels, individually, to be below the exempt quantity of 2,500 pounds, and no RMP Study is required. It should be noted, however, that the use of containment vessels will keep our communities safe regardless of whether a RMP is required.

References
1) From EPA 550-B-15-001, March 2015, List of Lists page 31
2) 29 CFR Ch. XVII (7-1-12 Edition). This regulation governs the preparation of a Process Safety Management Program (PSM). The storage of 1,500 lb or more of chlorine triggers a Federal PSM.

Eric Laurin, P.E., has almost 40 years of consulting engineering experience in designing water systems for private and municipal water providers in eight states and American Samoa. He is currently Director of Water Resources for CVL Consultants, Inc., a Phoenix-based firm. He will be presenting on the regulatory perspectives of gas chlorination at the June 2016 AWWA Annual Conference and Exposition, to be held in Chicago.
Of all the American Water Works Association Presidents, six have come from Minnesota. The following highlights each person, their contributions to the industry and Association, and documents their position in the presidential history.

John Thomas Fanning, State of Minnesota

John Thomas Fanning, civil engineer, was born in Norwich, CT, on December 31, 1837. He was educated in the public and normal schools of his native city, and then studied architecture until 1858. During the three following years, he mastered building construction by doing labor work as a mechanic; while at the same time, pursuing studies in theoretical engineering. In 1861 he enlisted as a private in the 3d Connecticut regiment, and rose gradually until he attained the rank of Lieutenant Colonel. He began the general practice of engineering and architecture in 1862, opening an office in Norwich, where he remained until 1870, having charge during that time of all the engineering work of the city, including the laying out of its cemetery and the construction of its public waterworks, also making plans for numerous mills and waterpower in New England.

From 1870 until 1880 he was engaged principally as Chief and Consulting Engineer in building and waterworks for cities. While superintending the construction of waterworks for Manchester, NH, he removed his office to that city, where he designed various public buildings. After 1880 he was called on by an association of citizens of New York and Brooklyn to make a report concerning an adequate public water supply for these cities, and of all the cities in the Hudson valley, from the upper Hudson River watershed. This project contemplated an aqueduct 225 miles in length, capable of conveying from the Adirondack region one billion gallons of water daily to New York and Brooklyn, at an estimated cost of $60,000,000.

In 1885 he prepared plans for the further development of the great waterpower of St. Anthony’s falls on the Mississippi River, at the City of Minneapolis, MN, and in 1886 constructed new dams on the works. During the same year he was Consulting Engineer of the upper Red River valley drainage commission, and directed the detailed topographical survey and reported on the drainage of 3,000 square miles of prairie lands in the valley of the Red River of the North at an estimated cost of $3,000,000.

Mr. Fanning received awards for architectural and engineering designs, and secured patents for a waterwheel, a turbine motor valve, a steam boiler, a steam-pumping engine, for improvements in fireproof building...
John Caulfield, State of Minnesota

John Caulfield was born May 8, 1854 in Castine, ME. He was the son of Irish parents, Jeremiah and Anna (Whelan) Caulfield. In 1859, the Caulfield family moved to St. Paul, MN. After studying at both public and parochial schools, Caulfield finished his studies at St. John's College in Stearns county Minnesota.

On September 2, 1857, the St Paul Water Company (a private entity) was formed to bring consistent water service to the St Paul. For almost 10 years the company had a difficult time establishing funding. In 1865, Charles Gillian stated he would personally guarantee the water works if an act to revive, amend, and continue the 1857 franchise was passed. The act passed and the St Paul Water Company developed water service.

Caulfield started working for the St Paul Water Company on October 10, 1870. In June of 1872, Caulfield became a Director on the company Board. In 1874 Caulfield was assigned the position of Secretary. On February 10, 1881, the St Paul Water Company was sold to the City of St. Paul for $350,000. The City appointed a Board of Water Commissioners “to keep the business out of politics.” Caulfield continued as the Secretary for the Board of Water Commissioners.

Mr. Caulfield married Agnes Grace in June of 1896. The following year he became the 13th President of the American Water Works Association.

Leverette N. Case, State of Minnesota

Leverette Case was born in Ohio in 1842 to Calvin Rublee Case and Lois Philinda. Details of Case’s early life are sparse, his valor during the Civil War being an exception. Although but a lad when the great battle broke out, he succeeded in being accepted by the recruiting officers and served throughout the war. Entering as a private, he was mustered out as major, being but 21 years of age then. Not surprising, the Loyal Legion button that appears in the accompanying portrait is a highly prized decoration. Case was part of a group of Michigan-area sharpshooters who were among the very first to enter the War. Their bravery was documented in author Raymond J. Herek’s 1998 book These Men Have Seen Hard Service – The First Michigan Sharpshooters in the Civil War.

Case spent 37 years engaged in Water Works affairs. Though well-versed in the details of construction and management of the physical plant, as it had been in the military, so it was in the professional world that Case earned his reputation as an executive officer. He spent a decade as general superintendent of the Detroit Water Works. During the last year of his term, there was considerably less water pumped than during the year that preceded his appointment, even though the city had increased its population by

Of all the American Water Works Association Presidents, since the organization’s founding in 1881, six have come from Minnesota.
more than 100,000. The Detroit Water Board had been a strictly non-political organization, but this character was abandoned about five years into Case’s career with them. Under these new circumstances, Case’s penchant for efficiency made him persona non grata. Fortunately, he was recruited to Duluth, MN.

The city of Duluth was taking over the local gas and water plants and quickly secured Case as their manager, a position he has held at the time of his election, in 1903, as the 22nd President of the American Water Works Association. His work in Duluth mirrored his efforts in Detroit. In five years, the water rates were reduced by 35%. It is such a record that is the hallmark of competent management rather than elaborate dams, costly pumping stations, and other consequences of unnecessary water waste, which are sometimes considered indications of sound management.

It must have been quite satisfactory to Case to be elected president of the national organization representing water works interests at its convention in Detroit – the very city where his record was so good economically and so poor from the point of view of partisan politics. In fact, on accepting the gavel from his predecessor, Mr. Campbell, he expressed this feeling as follows: “In being elected president of the American Water Works Association, in the manner in which it was done and in the city where it occurred, I feel I have attained the highest point in my career.”

Case eventually retired to Elsinore, CA, where, Herek’s book reports, “...the bosom friend and confidant of Ed Buckbee died of cancer.”

J. Arthur Jensen, Minnesota Section

J. Arthur Jensen was born on a farm in Brooklyn Center, MN. He attended rural schools until he was 15 years old, graduated from high school in Fergus Falls, MN, and then earned his degree in Civil Engineering from the College of Engineering at the University of Minnesota.

After brief jobs with the Northwestern Bell Telephone Company and the Chicago Milwaukee and St. Paul Railroad Company, Jensen joined the staff of engineers of the Minneapolis Water Department and became assistant engineer in 1907. Seven years later he was named Superintendent.

Jensen was named an AWWA member in 1911, and served on the Board of Trustees, Board of Directors, the Committee on “Standards for Distribution Systems,” and prepared specifications for valves, hydrants, sluice gates, cross connections, and distribution system safety.

In 1939, Mr. Jensen became the 58th President of the American Water Works Association.

Leonard N. Thompson, Minnesota Section

Leonard N. Thompson started his career with the St. Paul Water Utility on August 1, 1912. He eventually served as General Manager of the utility for nearly 34 years. Many of the concepts, plans, and projects which he and his staff developed and built still serve the citizens of St. Paul. These projects have stood the test of time and serve as a testimonry to Mr. Thompson’s ability and talent.

Thompson spent nearly 52 years serving St. Paul. During this time, he...
spent countless hours on the American Water Works Association, working both for North Central Section and on a national level. He twice served as Section Director and became the 64th President of the American Water Works Association in 1945.

Thompson served as Technical Advisor for the St Paul Water Utility from December of 1963 until June 1, 1964, when he retired.

Mr. Thompson stands alone in the Minnesota Section for longevity, service to his community and service to the water industry. He loved his work, and to it he devoted his entire life. The Leonard M. Thompson Award was established by the North Central Section in remembrance of this outstanding individual. The award is made annually to a Minnesota Section member who typifies the standards that were emblematic of Thompson’s contributions to the Section and the water supply industry.

**Clifford W. Hamblin, Minnesota Section**

Clifford W. Hamblin was born December 24, 1909 in Mason City, IA. Hamblin grew up in his birth town, attended the public schools (Mason City High School) and was a Junior College graduate. Hamblin earned his degree in Civil Engineering from Iowa State College in 1934.

After three years as Camp Engineer in the Conservation Corps, he transferred to the U.S. Corps of Engineers working on a channel project on the Mississippi River. In 1942 he made two shifts, first to the Aero Service Corporation and then to DuPont Company as a Construction Engineer. Hamblin, who was employed on the “Manhattan Project” by the DuPont Company, received an award from Secretary of Defense Henry L. Stimson for his work “essential to the production of the atomic bomb, thereby contributing to the successful conclusion of World War II.”

Hamblin was married in 1937 to Marjorie Hoffman. Together they raised two children.

In 1946 Hamblin returned to Mason City, IA, as a Construction Engineer and within a matter of months became Water Superintendent. Two years later he became City Engineer, a title which was changed to Director of Public Works.


Hamblin was an active in the American Water Works Association (AWWA) and spent many years advancing the goals of clean water. He was past-Chairman and National Director of both the Iowa Section and the North Central Section. He received the Fuller Award in 1968, and worked on several National AWWA committees. In 1972, Hamblin became the 91st President of the American Water Works Association.

Hamblin was also past-President of: the Engineers’ Society of Saint Paul, the American Academy of Sanitary Engineers, the Minnesota Professional Engineer’s Society, the National Society of Professional Engineers, the Minnesota Surveyors and Engineers’ Society, and the Kiwanis Club of Saint Paul. In 1972, Hamblin was honored as “Engineer of the Year” by the Minnesota Federation of Engineers’ Societies.
The objective of this project was to provide guidance to water utilities on the optimization of conventional treatment practices for the removal of cyanobacteria and metabolites, while meeting all other water quality goals associated with drinking water production.

**Background**

The incidence of cyanobacterial blooms in surface water is a worldwide phenomenon and there is a risk that a changing climate, continued urbanization, and increased nutrient loading of source waters may contribute to more frequent and intense cyanobacterial blooms in drinking water sources in the future.

The water quality issues associated with cyanobacteria are familiar to most water utilities drawing on surface water as their drinking water source, and include taste and odor (T&O) compounds and a range of toxins (cyanotoxins).

As most drinking water utilities still rely on conventional treatment processes, there is a need to further optimize these processes for removal and control of cyanobacteria and their metabolites. This project provides water quality managers and water treatment plant operators with the knowledge and tools required to apply conventional water treatment processes in the event of source water contamination with cyanobacteria.

**Approach**

This project investigated the application of conventional treatment processes, in particular coagulation, clarification, and filtration, for both the removal of cyanobacteria and the achievement of other water quality goals.
are favorable for cyanobacteria proliferation, namely warm weather and minimal water column mixing leading to stratification.

Finally, the behavior of the cyanobacteria bound in the floc was studied. This is an important, but often overlooked, aspect of conventional treatment, which essentially concentrates intact cells containing metabolites (such as taste and odour compounds and cyanobacterial toxins) into sludge. The sludge accumulates in the clarifier for a period, which can vary from hours to days depending on the clarification process, and is then removed for further treatment. The rate at which the cells lyse and release the metabolites, and the rate at which metabolites are subsequently biologically degraded, has important implications for finished water quality (if metabolites are released within the treatment plant), and raw water quality (if the sludge supernatant is recycled to the head of the plant).

Most of the experimental work was undertaken at the Australian Water Quality Centre, a business unit of the South Australian Water Corporation (SA Water). The project was developed with project partner Metropolitan Water District of Southern California (MWDSC). It was recognized during project development that the DOC levels experienced in South Australian water sources are high compared with many North American waters; therefore, the Californian State Project Water (SPW) was chosen as a source that was representative of a low DOC, low turbidity water. In addition, a toxin that has not been identified in Australia, anatoxin a, was acknowledged as an important issue for North American water utilities, therefore complementary experiments were undertaken on an Oscillatoria sp. known to produce anatoxin a. The control and the jar tests with Oscillatoria were undertaken at MWDSC.

Results/Conclusions

Literature suggests, and these results support, that pre-chlorination should be ceased in the presence of cyanobacteria. At low doses where the integrity and viability of cyanobacteria are not affected, there may not be any benefit in terms of coagulation and chemical demand, while there are significant costs associated with chlorination. At higher chlorine concentrations where the cell integrity and viability are affected, there may be beneficial effects on coagulation due to the loss of buoyancy of the cells; however, this will result in release of metabolites. When the T&O compounds MIB and geosmin are present, this will necessitate additional treatment for their elimination subsequently in the treatment train. The toxins STX, microcystins, and cylindrospermopsin, while susceptible to chlorination, may be released and not fully oxidized in this situation, even in the presence of a chlorine residual. This will also necessitate further treatment for their removal.

In contrast, potassium permanganate may be an alternative oxidant, particularly for the oxidation of manganese and iron. In the presence of A. circinalis, a residual of KMnO4 of 0.15 mg/L can be maintained for at least one hour without damage to cells and release of metabolites, and previous studies have shown this also to be the case for M. aeruginosa.

Coagulation with the three coagulants was very effective for cell removal as well as the removal of natural organic material (NOM, including DOC, UV absorbing compounds [UV254], and colour) and turbidity. In all combinations of coagulant, species, water, and pH conditions, the removals of DOC, UV254, and color are unaffected by the presence of the cells, and the dose required for optimum NOM removal as defined here (C/C0 DOC, UV, and colour ≤ 0.05) is also the optimum for cell removal (defined as ≥ 90% removal or the point of diminishing returns, where an
increase in coagulant dose produces little or no benefit in terms of cell removal.

While turbidity cannot be used as an indicator of the presence of cyanobacteria or cell concentration, the decrease in settled water turbidity with coagulant dose can be used as a surrogate for cell removal if the initial turbidity is ≈10 Nephelometric Turbidity Units (NTU) or above. In low turbidity waters (< 10 NTU), settled water turbidity cannot be used as a reliable indicator of cell removal.

In most conditions, C. raciborskii was least readily removed by coagulation. For species other than C. raciborskii, the presence of mineral turbidity (for example, in River Murray water), improved coagulation and settling due to the added weight of the flocs provided by the mineral particles, suggesting that a settling aid may be an option to improve settled water quality in low turbidity waters affected by cyanobacteria.

Although cell removals of up to 99% were observed, in general 90-95% removal was the optimum. This percentage removal appeared to apply to a wide range of cell concentrations. While this indicates effective coagulation, in the presence of high inlet cell numbers this could rapidly lead to an accumulation of cyanobacteria in clarifiers and filters.

Alum coagulation controlled to pH 6.3 was found to be the most cost-effective coagulant for removal of cyanobacteria while meeting other water quality goals. At pH < 6 there is a risk of cell lysis and metabolite release with any coagulant.

These findings can be applied to a wide range of water qualities, cell concentrations, and additional species (Oscillatoria sp., M. flos aquae, Pseudanabaena sp.) in cultured and environmental samples.

Filtered water turbidity, as determined in the standard jar test procedure (filtration through a glass fiber filter), could not be used in these experiments as an indicator of adherence to the filtered water turbidity goal of 0.1 NTU used in South Australian water treatment plants, as none of the tests resulted in filtered water achieving this goal. The filtration simulation apparatus used for limited experiments in this project provided more realistic information regarding filtered water turbidities than the standard jar test procedure.

Once captured in the sludge, cyanobacteria can remain viable and possibly multiply over a period of at least two to three weeks. Simultaneously, within one day some cells in the sludge will lyse and release NOM and metabolites. In the treatment plant this will cause an increase in metabolites and may compromise quality if there are no further barriers for these metabolites. In the sludge treatment facility, this may lead to an increase in metabolites and NOM and may compromise raw water quality in the inlet to the plant if the sludge supernatant is recycled to the head of the plant.

Applications/Recommendations

Recommendations for optimized operations during cyanobacteria challenges include:

- Do not use pre-chlorination for improved coagulation or reduced coagulant dosing during a cyanobacterial bloom unless comprehensive testing has identified a dose high enough to destroy released toxins. Do not apply pre-chlorination when cyanobacteria producing MIB or geosmin are present.
The incidence of cyanobacterial blooms in surface water is a world-wide phenomenon and there is a risk that a changing climate, continued urbanization, and increased nutrient loading of source waters may contribute to more frequent and intense cyanobacterial blooms in drinking waters sources in the future.

- Potassium permanganate dosing may be applied for the control of manganese and iron in the presence of A. circinalis and M. aeruginosa.
- Practice pH control to pH > 6 where this is not part of normal operations. This will reduce the risk of cell lysis and metabolite release during treatment.
- Optimize NOM removal using the criteria C/C0 DOC, UV, and colour ≤ 0.05 and the cell removal should be optimized as well.
- While turbidity cannot be used as an indicator of the presence of cyanobacteria or cell concentration, use the decrease in settled water turbidity with coagulant dose as a surrogate for, or indicator of, cell removal if the initial turbidity is >10 NTU or above.
- If the presence of cyanobacteria results in increased coagulant demand to achieve improved settled water turbidity, the application of a particulate settling aid, or even powdered activated carbon, may lead to improvements.
- Be aware that, although removal of cyanobacteria through conventional coagulation can be very effective, 100% cell removal is unlikely in normal full scale operations. In the event of high cell numbers entering the plant, monitor for cell carryover and accumulation in clarifiers. This can lead to serious water quality problems if not rectified.
- Once captured in the sludge, cyanobacteria can remain viable and possibly multiply over a period of at least two to three weeks. Simultaneously, within one day some cells in the sludge will lyse and release NOM and metabolites. In the treatment plant this will cause an increase in metabolites and may compromise quality if there are no further barriers for these metabolites. Therefore the detention time of cyanobacteria-laden sludge in the clarifiers should be minimized. In the sludge treatment facility, this may lead to an increase in metabolites and NOM and may compromise raw water quality in the inlet to the plant if the sludge supernatant is recycled to the head of the plant. If the cell numbers, metabolite concentrations, or UV254 of the supernatant return compromises plant inlet water quality, even with the significant dilution factor, this process should be terminated or additional treatments such as powdered activated carbon (PAC) applied to mitigate quality issues.

Research Gaps
During this project, a number of issues were identified as requiring further investigation:

- Further research into understanding the mechanisms of pre-chlorination for water quality improvement in the presence of algae and cyanobacteria is required. The operational observation that filtered water turbidity is improved when this process is applied can lead to chemical and infrastructure expenditure that has no scientific justification.
- Further evidence is required to confirm that KMnO4 dosing in the presence of cyanobacteria other than M. aeruginosa and A. circinalis will not lead to integrity loss and metabolite release.
- A number of arbitrary criteria were used to determine “optimum” coagulation conditions throughout this report. It was also found that the NOM of the water was the controlling factor in the coagulation process, and if the removal of DOC, UV, and color was optimized, this resulted in optimized cell removal as well, in most cases. In many water utilities, models are employed to predict NOM removal and determine coagulant doses to be applied in the plant. It would be worthwhile to use the
significant jar testing data generated through this project to apply various coagulation models and relate the predicted dose and NOM removals to the actual NOM removals and cell removals. This may give utilities some insight into the cyanobacteria removals they can expect while operating their plants under their standard conditions.

- Even under optimized conditions, the cell removals usually reached a point of diminishing returns of 90-95% removals. At high cyanobacteria concentrations, this may still lead to significant cell carryover through the plant and potentially a risk to finished water quality. In addition, it was found that C. raciborskii displayed lower removals than the other cyanobacteria in many cases and the removals might not even reach 90%. The addition of other chemicals, such as polymers, could be investigated, along with the possibility of enhancing settling with particulate aids. The addition of powdered activated carbon may also aid flocculation in the presence of cyanobacteria, particularly in low turbidity waters.

- Although in this study, waters of different quality were tested, given the advantages that the presence of turbidity appears to provide, testing a range of waters with varying turbidities >10 NTU and high and low DOC concentrations would add insight into this finding.

- The filtration simulation apparatus used for limited experiments in this project provided better information regarding filtered water turbidities than the standard jar test procedure of filtration through glass fiber filters. Further work to compare laboratory results from this apparatus with full scale turbidity data may lead to a more accurate procedure for jar testing to determine coagulant doses.

- More accurate information on DOC/cell for other species will help to determine the accuracy of the calculations for species other than M. aeruginosa.

- The finding that cyanobacteria can remain viable and possibly reproduce in alum sludge is an important one and requires further investigation. It would be beneficial to sludge management to develop a model that can use information on cell reproduction, cell lysis, metabolite release, and metabolite degradation, to predict processes that may take place in clarifiers and sludge treatment facilities that may lead to compromised finished water quality.

- The characterization of the NOM released from the cyanobacteria in the sludge is an important area of potential research, including the effect of sludge supernatant recycling on water quality and disinfection by-product formation.

Research Partner

- Water Research Australia Participants
- AIWQC (Australian Water Quality Centre)
- SA Water
- MWDSC (Metropolitan Water District of Southern California)
- Hunter Water
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#mywaterstory
January 2016 AWWA Updates
By Jon Eaton

STANDARDS
AWWA publishes over 170 standards that provide requirements for design, installation, performance, and manufacturing of products including pipe, chemicals, storage facilities, valves, meters, and other appurtenances; as well as industry-recognized consensus requirements, and practices, for water utility management and operations.

AWWA is accredited by the American National Standards Institute (ANSI) as an approved standards-developing organization for the water industry. Accreditation signifies that procedures used by AWWA in connection with the development of American National Standards meet the Institute’s essential requirements for openness, balance, consensus and due process.

The following standards were approved by the Association at the January 2016 Board meeting:

- B100 Granular Filter Material
- B101 Precoat Filter Media
- B114 Reverse Osmosis and Nanofiltration Systems for Water Treatment
- B507 Phosphoric Acid
- B600 Powdered Activated Carbon
- B603 Permanganates
- C215 Extruded Polyolefin Coatings for Steel Water Pipe
- C217 Microporous Wax and Petrolatum Tape Coating Systems for Steel Water Pipe and Fittings
- C541 Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates
- C671 Online Turbidimeter Operation and Maintenance
- C707 REAFFIRMATION: Encoder-Type Remote-Registration Systems for Cold-Water Meters
- C904 Crosslinked Polyethylene (PEX) Pressure Tubing, 1/2-inch (13 mm) through 3-inch, (76 mm), for Water Service
- C909 Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4-inch (100 mm) and Larger
- D106 Sacrificial Anode Cathodic Protection Systems for the Interior Submerged Surfaces of Steel Water Storage Tanks
- D107 Composite Elevated Tanks for Water Storage
- C104/A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
- C517 Resilient-Seated Cast-Iron Eccentric Plug Valves
- C542 Electric Motor Actuators for Valves and Slide Gates
- C750 Transit Time Flowmeters in Full Closed Conduits

POLICY STATEMENTS
Policy statements provide a record of the Association’s stance on a variety of issues and reflect the diverse interests of the membership.

The policy statement development process for the Association is designed to be open to full participation of the membership and to ensure careful review by appropriate AWWA boards, committees and other membership entities.

The following policy statements were approved by the Association at the January 2016 Board meeting:

- Asset Management, revised
- Fluoridation of Public Water Supplies, revised
- Qualifications-Based Selection of Professional Services, new policy

View any of the AWWA policy statements by visiting the following link on the web: www.awwa.org/about-us/policy-statements.aspx.
President Barack Obama on January 16 issued an emergency declaration that makes available federal aid for the drinking water crisis in Flint, MI. AWWA CEO David LaFrance released the following statement in response to the action.

“The American Water Works Association applauds President Obama for signing an emergency declaration that makes available federal aid for the drinking water crisis in Flint, MI. As we explore how the water quality problems could have been prevented, the near-term focus should remain on assuring safe and affordable water service to the people of Flint.

“It may be some time before all the facts surrounding Flint are understood. However, there are a few lessons that seem apparent. First, water chemistry is complex. When a community changes water sources or water treatment, unintended consequences can occur. Water systems must be alert to these potential issues and have plans in place to address them.

“Second, affordability will become a significant issue as we renew our aging water infrastructure. AWWA’s 2012 Buried No Longer report showed that repairing and expanding drinking water infrastructure in the United States will cost more than $1 trillion over 25 years, an expense that will be largely borne by water customers. This figure does not include the cost of removing lead service lines on private property.

“Water service is priced well below its value, but there are still families that struggle to meet essential needs. In many cases, utilities and customers will have to work collaboratively to remove lead service lines. There may be opportunities to expand existing government assistance programs to mitigate costs.

“Third, the experience of Flint underscores the importance of public communications about lead risks. Water utility customers should know how to determine if they have lead service lines, the benefits of removing lead service lines, and the steps to protect themselves and their families from lead exposure.

“AWWA is committed to helping water utilities, elected leaders and customers in applying these and other lessons from the crisis in Flint.”

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In a letter to the U.S. Senate Committee on Environment and Public Works, the American Water Works Association commended elected leaders for their work on legislation to assist with the cleanup of abandoned mines and put forth 10 principles that should be included in any final law.

The so-called “Good Samaritan” legislation would help address more than 500,000 abandoned hard rock mines throughout the American West, providing potential Good Samaritans with incentives to get involved in the cleanup. In the East, pollution from abandoned coal mines is damaging more than 10,000 miles of streams and rivers just in Pennsylvania and West Virginia. The cost of cleanup in Pennsylvania alone has been estimated at $15 billion.

“AWWA believes that the draft legislation being considered by the committee is a good first step in the effort to maximize the number of orphaned mine sites that receive remediation, while also ensuring the greatest environmental benefit from each mine remediation,” the letter states.

The letter notes that all but two of AWWA’s principles are in some way reflected in draft legislation. Missing are a) a requirement of public notification of all Good Samaritan projects from application to completion and b) a requirement that Good Samaritans notify downstream utilities of the actions they plan to take as part of each approved remediation plan.

AWWA’s principles for Good Samaritan legislation include:
1) Provide strict definition for “abandoned mine.”
2) Maintain existing liability for polluters.
3) Identify and define Good Samaritans.
4) Identify and define existing owners and operators of abandoned mines.
5) Maintain liability of polluters even in cases of actions taken by Good Samaritans.
6) Expedite the approval process for Good Samaritan permitting.
7) Include language that all remediation plans must yield a net environmental benefit to relevant waters, and do no harm to existing environment.
8) Include language that all Good Samaritans must notify downstream utilities of actions planned and a allow utility to prepare for or mitigate any potential consequences of such actions on drinking water, and to ensure monitoring after completion of remediation plan.
9) Include language that requires an EPA report to Congress and creation of online database of Good Samaritan projects.
10) Include a “Sunset Clause.”
ACCIDENTAL CHLORINE RELEASE EMERGENCY NOTIFICATIONS
How Soon Must They be Made?

By Jon Groethe, Minnesota Health Department Engineer

A critical piece of pre-planning for any water system emergency is having a complete list of emergency contact notifications readily available. Certain emergency notifications must be made immediately, being governed by strength of statute or historic legislative policy. Notifications that are required at the onset of an accidental chlorine release fall within that category.

The purpose of this article is to share with you three important and basic notifications that must be made when you are facing a chlorine release at your water plant, as well as the time frame in which they are expected to be completed. This article is not meant to address operations or all post-incident communications that take place.

For chlorine, the reportable quantity (RQ) is defined by two federal statutes (Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Emergency Planning and Community Right-to-Know Act) as being a release of 10 pounds or greater occurring in a 24-hour time window.

If you believe you have exceeded this amount but are unsure of the exact amount that has been released, it is better to go ahead and make the necessary notifications and establish a firm quantity later. There are no penalties associated with over-reporting.

Three immediate emergency notification calls must then be made. The first call is made at the local level of government (Emergency 911), which alerts local emergency responders. The second notification call occurs at the state level of government. This is the call you will make to the Minnesota State Duty Officer (1-800-422-0798). The duty officer will share information you have provided among state agencies having emergency response roles through both phone calls and email transmissions. On-call personnel at various state and local agencies will coordinate a field response based on regional resources.

The third call occurs at the federal level. This is the notification call you will make to the National Response Center (1-800-424-8802). This notification is equally critical because a hazardous chemical release may bear impacts with federal considerations (state and national borders, an immediate need for deployment of federal resources, etc.).

If you have leaked and are absolutely certain that the amount released is less than the RQ, you are still required to make a single call to the Minnesota State Duty Officer to satisfy Minnesota Statute 115.061 (Duty to Notify). But if you’re not sure of the amount released, you need to go ahead and make all three calls. Remember: if in doubt, report.

What is the allowable time frame in which all three notification calls need to be made? Superfund legislative history states that ordinarily “delays in making the required notifications should not exceed 15 minutes after the person in charge has knowledge of the release. Immediate notice requires shorter delays whenever practicable.” Therefore, the time frame that would be considered allowable and prompt is 15 minutes. All three notification calls should be completed consecutively, one following another. Although there may be competing priorities around you, making these notifications should be prioritized and accomplished.

An important note: The person in charge of the utility must always be the one directly making the emergency notification calls. This requirement is explicitly stated in the Federal Register, Part 302.69. Remember, as the person in charge, you cannot delegate notification calls to others. You must always personally notify, even when a notification call has previously been made by your local fire chief.

Within 30 days, an emergency release follow-up report must be submitted to Minnesota Department of Public Safety (DPS) Division of Homeland Security and Emergency Management. The Emergency Release Follow-up Report can be downloaded using a link located on the DPS website under Resources: https://dps.mn.gov/divisions/hsem/epcra/Pages/regulated-facilities.aspx.

The completed report should be emailed directly to Steve Tomlyanovich at the Minnesota Department of Public Safety at steve.tomlyanovich@state.mn.us.

To boil all of this down, there are three calls the person in charge must make during an accidental chlorine release, and they correspond to the three levels of government – local, state and federal. Once you have knowledge that a reportable release has occurred, you then have a 15-minute window to make all three calls. Completion of these actions will go a long way toward keeping your utility on course relative to prevailing emergency notification requirements.
Bacteriological Laboratory Assignment Update

The Winter 2015 issue of the Breeze included notice that, beginning January 1, 2016, community public water systems (PWSs), serving fewer than 1,000 people, will be assigned to the Minnesota Department of Health Public Health Laboratory (PHL) in St. Paul for quarterly bacteriological analyses.

Please note there has been a very late change to this plan. All contract laboratories assignments will remain the same as in 2015 except one: Pace Analytical Services – Minneapolis. PWSs that sent samples to Pace Analytical Services – Minneapolis in 2015 will be assigned the MDH PHL in 2016. A cover letter describing these assignments, including laboratory names, was included with sample supply kits shipped to each community PWS. In addition, a contact phone number was included in the cover letters.

As before, PWSs are free to choose to use – and pay for – a private, certified laboratory instead of their MDH-assigned laboratory. In those cases, the chosen labs must have the ability to report results electronically to MDH.

Finally, shipping costs will continue to be the responsibilities of PWSs. Overnight shipping will be necessary to ensure samples arrive at any laboratory within 24 hours of sample collection so they can be analyzed within the required 30-hour hold time. In anticipation of increased risks of sample rejection, small community PWSs are encouraged to take the following steps:

- Determine a shipping method that can deliver samples to the assigned laboratory within 30 hours.
- Prepare for occasional replacement samples in schedules and budgets.

Cook Mayor and Council Work for Free to Keep Water Rates from Rising

The Star Tribune of Minneapolis reported in its November 29, 2015 edition that the mayor and all four city councilors in the northern Minnesota town of Cook have agreed to forego their salaries in 2016 rather than have the city raise its water rates.

Cook has constructed a new plant and water tower and put in water and sewer lines in recent years. Maintenance supervisor Bud Ranta said they had 27 main breaks in the winter before the new lines and haven’t had one since. The city also built a new plant (iron removal with horizontal sand filters, the same as the old plant) when it relocated two wells. Much of the work was covered by grants from U. S. Department of Agriculture Rural Development and the Iron Range Resources and Rehabilitation Board.

“We’re proud of the funds we’ve secured” said Ranta. “We’re ahead of most other cities in Minnesota. We’ve done a lot of work in this town.”

We’re proud of the funds we’ve secured...
We’ve done a lot of work in this town.
Continuing his mission to protect Minnesota waters, Governor Mark Dayton convened a water quality summit recently (see page 48).

Last spring, Dayton held a press conference with Minnesota Department of Health Commissioner Ed Ehlinger to introduce the department’s drinking water annual report, which contained a special section on the impact of nitrate on Minnesota waters. Dayton referred to the report’s findings to call for agricultural best management practices, including buffer strips near streams.

His announcement of the water quality summit came at the annual meeting of the Minnesota Farm Bureau last November 21. A descendant of dairy farmers in southwestern Hennepin County, Dayton referred to his dad, Bruce Dayton, who had recently died and quoted the philosophy that had been passed on to him:

“What’s New With Lewis & Clark

Lewis and Clark the explorers are dead and have been for a long time.

The Lewis & Clark Regional Water System, however, is as alive as ever and continuing its progress through a tri-state area.

Conceived in 1988 as a way of serving water-challenged areas in South Dakota, Iowa, and Minnesota, the project takes water from beneath the Missouri River at Vermillion, SD, to communities as far as 60 miles away. The project will serve approximately 300,000 people when it is completed.

The pipes crossed into Minnesota last May and began serving Rock County Rural Water District, the first project partner in the state to receive water.

Luverne became the next after the completion of an 18-mile section of 24-inch pipe, installed by Carstensen Contracting of Pipestone, MN. Robert L. Carr Company of Marshall, MN, constructed meter buildings in Luverne as well as in Magnolia.

In December, the Lewis & Clark board of directors awarded another contract, this one for $5.2 million, to Carstensen Contracting for the segment of pipe between Luverne and Magnolia. Executive director Troy Larson said the Carstensen bid was about 30% less than what was budgeted.

This section of pipe is expected to begin this spring and be completed by the end of the year. Magnolia is a connection point for both Rock County Rural Water District and Lincoln-Pipestone Rural Water System.
Turkey vultures found a comfortable perch in Rochester a few years ago – atop the city’s Apache water tower. Todd Osweiler, the coordinator of environmental and regulatory affairs for Rochester Public Utilities, pointed out the obvious problem created by the squatters: “Lots of cleaning.” The mess moved to the utility’s Baihly tower, up the hill from Apache, when the latter was taken out of service for painting. That job complete, the city found that the turkey vultures not only returned to the Apache tower but also kept their quarters at Baihly.

Tired of bird excrement, the utility looked for ways to evict the freeloaders. A radio blaring Laser 101.7’s classical rock got the vultures to move, but only for a short time. “They’re smart birds,” said Osweiler. “They figured out there was nothing to harm them.” An Internet search produced other ideas, but not all were legal, including the hanging of a dead turkey vulture on the towers since it would require getting a dead turkey vulture, which is a protected migratory bird.

Water operations manager Cary Johnson said they could have gotten stuffed artificial turkey vultures, at a cost of $800 each. Johnson balked at the price as well as the thought of two water towers permanently adorned by a fake dead bird. Other solutions offered online were just as expensive.

Finally, one of the utility’s operators tried an inflatable Christmas decoration, and the results were effective. Johnson then ordered two air dancers, similar to those used for car dealers to attract attention, for $200 each. No more turkey vultures.

“Pretty cheap solution,” said Johnson, happy that their water towers are now poop-free.

### Plan Review Submittal Guidance

By David Weum, Minnesota Department of Health Engineer

The Minnesota Department of Health’s (MDH) plan review authority comes from Minnesota Rule 4720.0010, which can be paraphrased as: “no system of public water supply shall be installed, materially altered, or extended until complete plans and specifications with any additional required information are submitted to and approved by the Department of Health.”

Field review has been allowed as an option in some cases. If the field review option is used, it is at the discretion of the system’s MDH district engineer who will then review the work on-site.

Most municipal drinking water projects are required to be submitted by a licensed professional engineer, registered in Minnesota. Some specific projects are allowed to be submitted by other representatives, but they must be submitted by the licensed contractor performing the work, the owner, or a professional engineer.

Non-municipal public water suppliers are encouraged to use the services of professional engineers but are not required to do so.

A table with this information is available at [www.health.state.mn.us/divs/eh/water/planreview/subguidance.html](http://www.health.state.mn.us/divs/eh/water/planreview/subguidance.html).

### Smithsonian Exhibit on Water Coming to Minnesota

During 2016 and 2017, the Smithsonian Institution’s Museum on Main Street program, focusing on drinking water, is coming to six sites in Minnesota: Red Wing, New London-Spicer, Lonsdale, Sandstone-Pine City, Detroit Lakes, and St. Peter.

Minnesota was one of five states selected by the Smithsonian Institution to launch these traveling exhibits. The local partners will host the exhibit for six weeks at a time starting this June and extending to April of 2017.

The program is led by the Minnesota Humanities Center, and the center’s Jennifer Tonko says, “What really makes us special, at least from the Smithsonian’s perspective, is the broad group of partners who are part of the project.” The partners include the Minnesota Department of Health, Minnesota Pollution Control Agency, Minnesota Section of American Water Works Association, and the Minnesota Historical Society.

The host communities will embark on an exploration of water and their identity, history, and culture. These communities will tell their local water stories and envision the future of water through companion exhibitions, community events, and educational programming intended to engage thousands of Minnesotans.
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Traffic Accident Kills, Injures, Pair of Bloomington Employees

A Bloomington Public Works employee was killed, and another was seriously injured, on January 28 when an SUV rear-ended the truck in which they were sitting. Tyler Lenort, an equipment operator, died from injuries in the crash, and another equipment operator, Daryl Bittmann, remained in intensive care more than a week later. The employees were performing snow removal on American Boulevard.

“It is with much sadness that I report the passing of Tyler Lenort. He was a dedicated city employee of 15 years who will be greatly missed,” City Manager Jamie Verbrugge said. “Our thoughts and condolences are with Tyler’s family, friends, and coworkers during this very difficult time. We are also focused on Daryl’s recovery. He is a dedicated employee of more than 28 years.”

The city has held a fundraising event for Daryl Bittmann and the family of Tyler Lenort. Anyone who would like to contribute to the fund may send a check to:

City of Bloomington, Public Works Department

c/o Carol Kaszynski, 1700 W. 98th Street, Bloomington, MN, 55431

Board Highlights from February 19, 2016
Minnesota American Water Works Association (Minnesota AWWA) governing board meeting

Donation to American Public Works Association
The board approved a $2,000 donation to support the American Public Works Association PWX (annual conference and exposition, formerly called the International Public Works Congress and Exposition), which will be held in Minneapolis this August.

Community Engineering Corps
The board approved the formation of a Community Engineering Corps (CEC) committee, within the Public Affairs Council, with a $300 budget, to support CEC, part of an American Water Works Association (AWWA) philanthropic initiative to assist underserved communities within the United States. Minnesota is the first section within AWWA to form such a committee and has the goal of bringing a Minnesota project proposal to CEC.

Great Lakes Compact Support Letter
The board agreed to a letter of support to Waukesha, Wisconsin, regarding issues surrounding the use of Great Lakes. Waukesha is seeking support to follow the Great Lakes Compact Agreement that is already in place.

Philanthropic Initiatives
Jon Eaton presented information to the governing board on AWWA’s new philanthropic initiative, The Water Equation, and the board agreed to provide information and links to The Water Equation on the Minnesota AWWA website. The section will also develop plans on how to support The Water Equation and will incorporate it with other philanthropic initiatives, such as Water for People and the Community Engineering Corps.
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(Please note: 4 person scramble, register as a team or we will put you in one)

Online Registration Only: www.mnawwa.org/event/WFPSpringGolf2016

Questions: Chris Voeltz, City of Saint Peter Public Works, (507) 934-0670

Willingers Golf Club Directions: From Burnsville, follow I-35 South approximately 15 minutes to Exit 69. Go right (west) on Highway 19 for 1 1/2 miles to Canby Trail. Right on Canby Trail to Willingers Golf Club.
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http://www.mnawwa.org/event/2016wfpconcert

Questions: Jim Hauth, Chair, MN AWWA Water for People, (612) 675-5216 or Chris Voeltz, City of Saint Peter Public Works, (507) 934-0670
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The Museum will be featured during the Annual Conference in Duluth September 20-23, 2016.

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- Old water meters
- Gauges, laboratory or mechanical equipment
- Wooden or other old pipes
- Old maps, plans or drawings
- Old water treatment books, manuals, magazines or product advertisements
- Old photos showing projects, water tanks, or other significant/interesting water history
- Any other historical items you think might be interesting to conference attendees!

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**How to Contribute:**
To contribute an item, contact Steve Schneider at steve.schneider@ci.stpaul.mn.us. Please provide a description of the item, including approximate dimensions and weight, a photo of the item, and any other information about historical significance.

**Be a Museum Curator:**
If you are a seasoned or retired water professional, please consider helping at the Conference by volunteering a few hours at the museum to help answer questions and provide historical and background information about the water industry. To be a curator, contact Carol Kaszynski at ckaszynski@bloomingtongmn.gov
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WATER QUALITY SUMMIT
Casts Spotlight on ‘Serious Problem’

U.S. Congresswoman Betty McCollum greeted approximately 800 participants to Minnesota Governor Mark Dayton’s Water Quality Summit in St. Paul on February 27. The governor himself, in his opening statements, was interrupted by a group protesting the Sandpiper crude-oil pipeline. With signs that included, “Love Water, Not Oil” and the group leader speaking through a bullhorn, the protesters expressed their concerns about the pipeline crossing sensitive lands and wetlands of the Ojibwe in northern Minnesota, asking why the topic was not part of the summit and emphasizing the need for tribal members to be part of the pipeline’s discussion. The group left the stage after the governor said he would meet with them later in the morning.

Governor Dayton noted that at least as many people in attendance had been turned away because of space constraints, calling the “overwhelming response” an indication that his goal “to spotlight this serious problem” was achieved. “Clean, safe water is something we must insist upon.” Dayton said what is needed is “not more laws and regulations. They are last resorts. What we really need is to establish the ethic of clean water practices.

“I urge you and I ask you is to spend the day establishing our ethic—that clean water practices are every Minnesotan’s responsibility. Anything less is unacceptable. It is achievable if all of us do our part.”

After the opening session, participants broke into groups to discuss various topics, which were recorded by staff members for the governor’s consideration.

The summit concluded with Lt. Governor Tina Smith leading a panel of Minnesota business leaders on the role of industry in protecting water.
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<td>M.E. Simpson Co. Inc.</td>
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