Aging Infrastructure
Declining Demands: A dilemma for Water Utilities

Inside:
Can operators play a role in plant design?
A look at bottled water
Governing Board Highlights
Case Study
An Impressive and Visually Stunning New Tank for West Salem, Wisconsin

PROJECT OVERVIEW:

The Village of West Salem, WI, has become the home of the largest Composite Elevated Tank (CET) to date built by Engineering America. The project was designed by Foth Infrastructure and Environment of Green Bay, WI, and construction began in the Spring of 2009.

The West Salem CET is an impressive 750,000 gallons with an overflow height at 176' above grade. The concrete column is 139' above grade and 16' below grade. The foundation, 62' in diameter and 3'8" thick, is constructed of 440 cubic yards of concrete and 32 tons of rebar. The Aquastore glass-fused-to-steel tank that sits atop the concrete column does not require periodic painting, which makes it a logical choice for municipalities when long-term maintenance costs are evaluated.

The tank is white with an attractive logo of the Village of West Salem in blue. The most unique feature of the CET is that the concrete column is stained white, which gives the structure a brilliant clean and finished look.

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Teresa Schnitzler, City Administrator

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A good old fashioned Minnesota winter

Wow! What a winter we are having! Did we get too soft due to several years of relatively mild seasons and we do not remember what a good old-fashioned Minnesota winter is like? Or is it because of the effects of a changing climate? Whatever the reason, it certainly is causing all of us to revisit some cold weather gear and procedures.

Unfortunately, some of our customers have to bear the inconvenience of service interruption due to broken water mains or frozen service connections. The attention to these issues by many of our members deserves a long overdue THANK YOU!!

There are not many careers out there that include round-the-clock attention to service interruptions that are caused by the weather that you end up dealing with. Repairing a broken main or thawing a frozen service at -20 degrees Fahrenheit is not high on anyone’s priority list, unless you are one of our many members in the water industry making sure our customers have the water they need.

I hope to hear more accounts of the difficulties of operating a water system this winter in the many opportunities for networking at Minnesota Section AWWA events this summer. I know we have some stories to tell. How about you?

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Message from the Director

Winter board meeting summary

We just returned from the winter board meeting in Austin, Texas. The “we” is myself, incoming section director Jon Eaton, and the winning director-at-large candidate, Uma Vempati. Congratulations to Uma for giving an excellent speech to the AWWA board and exhibiting his passion for the water industry, the reason he is now a board member.

The other election results:
The American Water Works Association board of directors elected Gene Koontz of Lemoyne, Pennsylvania, as the association’s next president-elect and chose five new vice-presidents as well as two directors-at-large.

An AWWA member since 1982, Koontz oversees environmental services for Gannett Fleming Inc., a global infrastructure firm that provides planning, design, technology, and construction management services for a diverse range of markets and disciplines. He has served as an active volunteer and leader within the AWWA Pennsylvania Section as well as on the broader association level.

Koontz begins his role as president-elect in June 2014, at the conclusion of AWWA’s Annual Conference and Exposition in Boston, Massachusetts. He will serve his one-year presidential term beginning in June of 2015.

A civil engineering graduate from Lehigh University, Koontz has held many leadership positions within the Pennsylvania Section, including section chair, chair of the Water Quality Committee, member of the Water Utility Council, and chair of the Program Committee. On a broader level, he has served on three separate Water Research Foundation project advisory committees.

The five new vice presidents selected by the board are:

- Brenda Lennox, the Pacific Northwest Section director, from Tualatin Valley Water District. She currently serves on the Management & Leadership Division, Standing Committee on Diversity & Member Inclusion, and Heroism Award Committee.
- Tom Moulton, a former board member of the Ontario Water Works Association, who is profit centre manager for Emco Corporation Waterworks. Previously, he was involved in the section Membership, Publication, and Communications committees.
- Warner Palermo, director of technical services at Integrated Global Solutions in Puerto Rico. He has served for more than 10 years at the section board level and in many different leadership positions.
- Lela Perkins, Rocky Mountain Section director from Colorado, who works as engineering manager at Black & Veatch. She has served as section chair, vice chair, trustee, Warner Scholarship chair and Communications Committee chair, among other positions.
- Steve Shoaf, North Carolina Section director, who is also director of the city of Asheville Water Resources Department. Shoaf has been a leader in the section for more than 20 years with a special focus on operator training.

Also elected were a director-at-large and a service provider director-at-large.

The director-at-large is Uma Vempati from the Minnesota Section, a principal engineer with Brown and Caldwell. At the section, he has served as secretary-treasurer, assistant secretary, and as a member of various committees.

The service provider director-at-large is Pete Samson from the Ontario Water Works Association. Samson is team leader and system integrator with Eramosa Engineering Inc. in Guelph, Ontario. At the section, he has served on many committees, including the Young Professionals Committee, the Website Ad-Hoc, and the Young Professionals Student Chapter Leadership Forum.

The association budget was approved by the board. The 2014 budget is just under $28 million. The association is budgeting for some innovative projects that will be addressed and is spending $980 thousand year for at least the next five years to retire the previous pension plan. More budget details will be in the consent agenda for the section board meeting in February.

A summary of new action items that were approved include:

- Formation of a Strategic Development Advisory Committee to advance the association in philanthropic areas to initially include scholarships, outreach to student chapters and young professionals to explore career opportunities, and several future developments. The first year will focus on feasibility and potential fund raising activities.

- A memorandum of understanding between AWWA, American Society of Civil Engineers, and Engineers without Borders. The purpose of this is to provide expertise in areas of design and operation for systems that have exhausted all other options for funding of water systems that are needed within the United States to support improved quality of life.

- Creation of the India Initiative, a plan to increase AWWA presence. The initial plan is to open an office and provide staff in India. Initiative funding and possibly grants will be used to support this for the first two years. Through new memberships and grants the project is planned to sustain after that time. Preliminary goals include improving accountability, providing water 24/7, and refurbishing and extending water distribution systems.
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So last year Minnesotans celebrated a mild winter and what did we get for it? A winter-like spring. This year we are getting a beyond-regular winter, complete with vortexes and other terms those good-hair people posing as meteorologists make up so they can increase their television ratings and make high-ranking officials close the schools and everything else except for government offices since public-sector employees are such hearty folks, and maybe that means we will get a regular spring.

“Enjoy the Spring Breeze, which promises to be as refreshing as the weather we will have by Opening Day.”

With all this to look forward to, enjoy the Spring Breeze, which promises to be as refreshing as the weather we will have by Opening Day (April 7 in Minnesota – Twins vs. Athletics). This issue has exciting news about a new addition to the American Water Works Association board of directors (one of our own), a wellhead protection success story, a look at bottled water from the perspective of the manufacturers of Dasani, and a preview of the Minnesota Department of Health’s video on the 40th anniversary of the federal Safe Drinking Water Act.

Read it on your porch or balcony as you soak in the sultry season.

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The Minnesota AWWA board of directors met in St. Paul on February 6, 2014.

Financial Report: as of September 2013, section income for the year was $304,574 and expenses were $294,795 for a net income of $9,779. Investments were up since the beginning of the year by $47,835 for a net gain of $57,714.

The board approved the 2014 budget with projected revenue of $28,728,486 and expenditures of $28,126,155, resulting in an operating margin of $602,331, and further approved a pension contribution of $980,170, innovation funds of $350,000, and capital expenditures of $946,200.

The following balances were reported: $212,652 in the general reserve fund, and $243,799.86 in the endowment fund, as of November 30, 2013. The funds have grown by $75,748.35 since then.

The Information Technology Committee is reviewing the website, modifying the registration and online processes; exploring opportunities for aiding and assisting the membership on technology initiatives, such as meter reading, work order management, etc.; and pursuing initiatives to share city and industry-wide ideas within the website, social media, and various publications.

The Public Information Committee was involved in two projects last year that will continue in 2014. The first was to partner with H2O for Life, a non-profit organization, to reach out to schools around Minnesota to bring awareness to students about tap water and source water protection. This project was to help sponsor a contest to initiate a poster featuring water and conservation issues. This was successful and we will participate again. The section will contribute $1,000 to the contest. The other project was a taste test on stage at the Minnesota State Fair.

The Water For People Committee has scheduled its concert for Saturday, April 26. The spring golf event will be May 22 in Northfield. The motorcycle ride will be August 16, and the Splashdash 5K run/walk is being planned.

Water Works! A Drinking Water Institute for Educators, held at the Cascade Meadow Environmental Learning Center Rochester in 2013, will be conducted at Minncor Industries this summer from Monday, August 4 to Wednesday, August 6. Each year Minnesota science teachers attend the three-day Institute, learning about drinking water and about ways to develop inquiry-based activities that can be incorporated into their existing science curriculum. The program is free to interested teachers, who will receive college credit for their participation. Water Works! is sponsored by the Minnesota Department of Health and the Minnesota Section of AWWA and is conducted through a partnership with Hamline University’s Center for Global Environmental Education. More information is available on the MDH website at http://www.health.state.mn.us/water/institute/index.htm.

A committee is being formed to plan activities to commemorate the 100th anniversary of Minnesota AWWA in 2015.

The Regional Meeting of Section Officers, or RMSO (pronounced Rimzo) is April 4-5 in Des Moines. The AWWA Annual Conference and Exposition will be June 8-12 in Boston. (The Red Sox are on the road until the final day of the conference.)

The next Minnesota AWWA board meeting will be April 26.
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Most of the United States’ drinking water infrastructure is nearing the end of its useful life and will require a staggering public investment during the next 20 years. Watermain replacement will cost more than $1 trillion by 2035. In Minnesota the estimated cost is $5.46 billion. Demand for water throughout the country has been decreasing, including in several Minnesota cities, which has resulted in a decrease in revenue. Rate increases or public subsidies will be needed. To win public support for needed additional revenue, several utilities have developed strategies that include
• completing a rate study by an outside consultant,
• establishing a citizen committee,
• developing a public outreach program, and
• providing updates every six months to elected officials.

The city of Brooklyn Park, MN (population 75,900), has developed a strategy to fund infrastructure projects that has resulted in expenditures of $25 million on water supply projects in the past decade. Typically water supply infrastructure consists of facilities and equipment to pump, divert, store, treat, and distribute safe drinking water. The drinking water infrastructure in the United States includes more than 1 million miles of pipe, which is more than four times longer than the national highway system. In addition to pipes, the infrastructure includes groundwater wells, surface-water intakes, dams, reservoirs, storage tanks, drinking water facilities (e.g., treatment plants and pumping stations), and aqueducts. The average useful life of several water infrastructure components is shown in Table 1.

### TABLE 1: Design life of drinking water systems

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>DESIGN LIFE- years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoirs and dams</td>
<td>50–80</td>
</tr>
<tr>
<td>Treatment plants—concrete structure</td>
<td>60–70</td>
</tr>
<tr>
<td>Treatment plants—mechanical and electrical</td>
<td>15–25</td>
</tr>
<tr>
<td>Trunk mains</td>
<td>65–95</td>
</tr>
<tr>
<td>Pumping stations—concrete structures</td>
<td>60–70</td>
</tr>
<tr>
<td>Pumping stations—mechanical and electrical</td>
<td>25</td>
</tr>
<tr>
<td>Distribution</td>
<td>60–95</td>
</tr>
</tbody>
</table>

SOURCE: USEPA, 2002
DAWN OF THE REPLACEMENT ERA

From the following information, it can be concluded that the nation’s public water systems face potentially staggering public investment needs during the next 20 years:

- A large part of the US public water system dates back to the years shortly after World War II; therefore, a significant amount of buried infrastructure is at or very near the end of its useful life.
- Most distribution pipes installed in the United States from the 1800s through the 1960s were manufactured from cast iron. Because of changing materials and manufacturing techniques, pipes manufactured in the 1920s have an average life expectancy of about 100 years, whereas pipes manufactured in the post-World War II boom have an average life of about 75 years. However, this does not account for age of pipe and installation procedure, which affect the life of the pipe. Using these average life estimates and counting the years since the original installations, it appears that public water systems will be facing the need for significant pipe replacement over the next few decades.
- In many instances the population of an area has significantly increased and/or shifted geographically since the original distribution system was installed. Table 2 shows the water use for the years 1950 (when many of the current pipes were installed) and 2000. The shifting population brought significant growth to some areas of the country, which required a larger pipe network to provide water service.
- Public water systems may need to replace infrastructure and upgrade treatment plants to comply with a number of new regulations to be implemented under the Safe Drinking Water Act. Many municipalities may also need to make significant investments to upgrade or expand wastewater infrastructure or to meet regulatory mandates.
- A big cost looms to address compliance with combined sewer overflow and stormwater regulations. The nation’s public water systems are stressed; the American Society of Civil Engineers (ASCE) gave the US water infrastructure a grade of D-minus in its 2009 Report Card for America’s Infrastructure (ASCE, 2009). Ten years ago, the US Environmental Protection Agency (EPA) estimated that by 2020 the infrastructure would be rated as poor, very poor, or “life elapsed” (Figure 1) because of the age and deteriorating condition of nearly half of the water and sewer pipes in the United States (USEPA, 2002).

The strength and integrity of the United States’ water infrastructure is critical to its long-term health. Although the financial cost of upgrading or replacing the infrastructure is daunting, the cost of ignoring it could be catastrophic. Because of the poor condition of aging and leaky pipes, the US Geological Survey (USGS) estimated that nationally there is a daily loss of more than 6 bil gal of expensive, treated water, which is about 14% of the nation’s daily water use. It is reported that in the last 19 years in the Midwest the annual number of main breaks for large utilities has increased from 250 per year to 2,200 per year (Symmonds, 2012). In 2003, the city of Baltimore, MD (population 619,500), reported 1,190 water main breaks—an average of more than three per day. Duluth, MN (population 86,300), reported 140 water main breaks per year in a 425-mile network. Hibbing, MN (population 16,350), reported 60–70 breaks per year in 140 miles of water mains. St. Paul, MN (population 285,068), has had an average of 140 breaks per year for the last 10 years in 1,200 miles of water mains.

### TABLE 2: US water use 1950 and 2000

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>1950</th>
<th>2000</th>
<th>Change - %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population – millions</td>
<td>93.4</td>
<td>242.0</td>
<td>159</td>
</tr>
<tr>
<td>Usage – bgd</td>
<td>14</td>
<td>43</td>
<td>207</td>
</tr>
<tr>
<td>Per capita use - gpcd</td>
<td>149</td>
<td>179</td>
<td>20</td>
</tr>
</tbody>
</table>

Although utilities spend billions on infrastructure each year, public water systems face an annual shortfall of at least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations. The shortfall does not account for any growth in the demand for drinking water during the next 20 years (ASCE, 2009). Table 3 shows data from AWWA’s Buried No Longer report regarding the investment needs in water mains from 2011 to 2035 and from 2011 to 2050 for various regions in the United States (WUC, 2012). As indicated in ASCE’s 2009 infrastructure report card for Minnesota, the drinking water infrastructure will require an investment of $5.46 billion during the next 20 years (ASCE, 2009).

Utilities in the United States are spending less money on infrastructure improvements for a variety of reasons. Utilities spend a combined total of approximately 2.4% of gross domestic product on transport and water infrastructure compared with 5% in Europe and 9% in China (Conley, 2012). These rates may be different because European infrastructure is much older than that of the United States, and China is constructing new infrastructure to meet the demands of a more affluent society. As documented in AWWA’s report (2012), restoring existing water systems as they reach the end of their useful lives and extending them to serve a growing population will cost at least $1 trillion during the next 25 years if the United States is to maintain its current level of water service. Delaying the investment may result in degrading water service, increasing water service disruptions, and increasing expenditures for emergency repairs.

### DECREASING DEMAND

Many water utilities across North America are experiencing declining water sales. Figure 2 shows the estimated use of water in the United States for the years 1950 through 2005. A thorough investigation was conducted to determine the cause of declining use. The results indicated that the declining demand was...
mostly by residential customers and was because of the decline in the number of individuals per household and the increased use of low-flow appliances. Although there has been a clear trend of declining residential customer water use during the past 25 years, this trend may begin to flatten in the next 20 years. Both of these trends have theoretical limits on how low they can go (Rockaway et al, 2011). However, the demand is not likely to increase in the future, and this needs to be considered.

As public water systems are facing a growing financial obligation because of the need to replace or repair an aging infrastructure, there is a corresponding decrease in water demand. In Minnesota, this is partly the result of increased emphasis by the Minnesota Department of Natural Resources on conservation efforts to reduce the growing water shortage in the southeast part of the state. The economic crisis has decreased new developments, and people are moving either to rented or smaller houses. The result of this trend is reduced per-capita water demand, which results in lower revenues. Figure 3 shows examples of several cities in Minnesota that experienced a decrease in or stable water use during the past decade even though Minnesota is considered a water-rich state, unlike the western and southern parts of the United States. Water utilities are experiencing a similar pattern of water use in almost every region of the country.

DILEMMA OF THE WATER SUPPLIER
Public water systems are using more chemicals and employing enhanced treatment methods to meet national standards for drinking water, thus increasing the cost of operating the system. In addition, the current economic conditions are taking a toll. The dilemma for water utilities is that they already have the infrastructure
in place, which needs to be maintained and upgraded irrespective of the amount of water sold to their customers. With the decrease in demand and revenue, there is an economic need driving the public water systems to increase water rates. However, rate increases are not popular, and because of the economic condition of the United States and its cities, it is difficult for water suppliers to get support for increasing rates.

Meeting this challenge requires new partnerships among utilities, states, and the federal government. Utilities need to examine their rate structure to ensure long-term viability and efficiency. States may need to streamline their programs to provide loans to utilities. The federal government may need to significantly increase loan assistance for utilities. Forecasting, scenario building, and planning are more important than ever for understanding demand and improving predictive capacity. In addition to loan assistance from the state and federal governments, there are various other measures that public water systems can implement to address this issue.

**Comprehensive strategy.** Public water systems and local government should develop a comprehensive local strategy that includes

- assessing the condition of the drinking water system infrastructure;
- strengthening research and development by investigating new material and technologies to determine the most cost-effective time to replace a water main rather than continually repairing it;
- working with members of the public to increase awareness of the challenge ahead, assess local rate structures, and adjust rates where necessary; and
- building managerial capacity by having staff members attend AWWA trainings, which will assist in sustainability planning.

**Management.** Better management of water and wastewater utilities

![FIGURE 3: Water demand for Saint Paul (A), Plymouth (B), and various Minnesota cities (C)](image)

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can encompass practices such as asset management and environmental management systems. It is helpful to understand the full life-cycle cost of the public water system for financial viability as described in Effective Utility Management (USEPA, 2008). Maintaining an accurate inventory of infrastructure assets and quantifying renewal needs can help a utility justify large capital expenditures to its governing boards and customers, schedule renewal programs over a practical period of time, and decrease costs by improving its bond rating.

**Adequate rates and rate adjustments.** According to a 2002 US Government Accountability Office (USGAO) report, more than one quarter of municipalities charge water rates that do not cover their costs. These inadequate rates contribute to the gap that exists in many systems between available funds and the costs of needed repairs and replacements. Rate restructuring and setting rates that reflect the full-cost pricing of service can help utilities capture the actual costs of operating water systems, raise revenues, and help conserve water. Stakeholder understanding and support will be essential (USEPA, 2008).

Utilities can develop assistance programs for low-income and disadvantaged groups such as senior citizens. Frequent rate adjustments can be made, forward-looking rates can be implemented, and demand-repression adjustments to programs and prices can be implemented.

**Decoupling of sales and profits.** Separating sales and profits can be beneficial in that it caps revenues, maintains cash flows, and reduces risk in the face of declining and apparently less-predictable demand.

**Expand service.** Many public water systems face declining rate bases as customers move from neighborhoods served by the existing system to outlying areas. Public water systems may choose to expand their systems to these new neighborhoods, recapturing the old customers. At this point, however, the public water systems have to pay for building the new system as well as maintaining old ones, even though they may have essentially the same number of customers. It is important that public water systems charge service expansion (water availability) fees to customers or developers in the new neighborhoods to pay for the expansion costs.

**Implement a fix-it-first philosophy.** As suggested in the 2006 USEPA report, the state should carefully monitor where new development is occurring and should favor repairing and upgrading existing systems over new construction. State loan funds could be used to support new development in existing neighborhoods rather than in new neighborhoods, thereby improving the efficiency of existing systems and reducing the quantity of water needed.

**Maintenance.** Public water systems often borrow money on the bond market to pay for their capital projects. The interest rate that the utilities must...
Typically the utility management requests more staff to complete additional tasks. Brooklyn Park provides a detailed analysis, as shown in Table 4, to justify the number of required staff.
pay is determined by the market’s assessment of its management and particularly a public water systems’ management of its physical assets (treatment plants, pipes, and pumps). A fix-it-first policy that stresses maintenance of existing physical assets may contribute to a higher bond rating, lower borrowing costs, and result in a lower overall cost for water delivery. As discussed previously, public water systems will need to increase their rates to generate sufficient revenue to perform infrastructure maintenance and to address the revenue shortfall resulting from decreasing demands. Because of the current economic situation, raising rates requires a considerable degree of political will to overcome the challenge of resistance to change. There are various options that utility staff can implement to get council members and citizens on board with planning:

**Communication.** Effectively communicating an infrastructure’s improvement needs is vital to obtain approval for the revenue required. Brooklyn Park, MN (population 75,800), has been successful in obtaining funding for more than $25 million of infrastructure improvements in the past 10 years. The utility provides information in an easy to understand format to elected officials on a regular basis, such as:
- number of water main breaks and how much it costs to repair them;
- age of infrastructure and remaining useful life;
- value of water system, addressing the fact that the total value of the water system is decreasing if depreciation is more than the capital.

### TABLE 4: Brooklyn Park, MN, water distribution system staffing needs

<table>
<thead>
<tr>
<th>Meters</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
<th>Hours</th>
<th>Adj Hours</th>
<th>FTE</th>
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<tbody>
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<td>47</td>
<td>18</td>
<td>40</td>
<td>34</td>
<td>29</td>
<td>27</td>
<td>50</td>
<td>44</td>
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<td>40</td>
<td>468</td>
<td>3744</td>
<td>4500</td>
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<tr>
<td>Reads</td>
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<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>26</td>
<td>298</td>
<td>225</td>
<td>0.11</td>
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<tr>
<td>Meter/SD Group</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.99</td>
<td></td>
</tr>
<tr>
<td>WM Repairs</td>
<td>8</td>
<td>2</td>
<td>12</td>
<td>15</td>
<td>36</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>106</td>
<td>848</td>
<td>1500</td>
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<tr>
<td>Water Service Work</td>
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<td>12</td>
<td>15</td>
<td>7</td>
<td>14</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>2</td>
<td>115</td>
<td>920</td>
<td>2000</td>
<td>0.95</td>
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<tr>
<td>Valve Work</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>2</td>
<td>22</td>
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</tr>
<tr>
<td>Hydrant Work</td>
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<td>5</td>
<td>3</td>
<td>100</td>
<td>14</td>
<td>13</td>
<td>26</td>
<td>26</td>
<td>18</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>239</td>
<td>1612</td>
<td>2280</td>
<td>1.10</td>
</tr>
<tr>
<td>Hydrant Clearing</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>18</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>239</td>
<td>1612</td>
<td>2280</td>
<td>1.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Support to Others</td>
<td>499.2</td>
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</tbody>
</table>

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FIGURE 7: Brooklyn Park, MN, comprehensive maintenance district

<table>
<thead>
<tr>
<th>Adequate = Green (4.0-5.0)</th>
<th>Marginal = Blue (3.0-3.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems = Red (0.0-2.9)</td>
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</tr>
<tr>
<td>Maintenance District</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Watermain (mb)</td>
</tr>
<tr>
<td>District 1</td>
<td>43</td>
</tr>
<tr>
<td>District 2</td>
<td>48</td>
</tr>
<tr>
<td>District 3</td>
<td>47</td>
</tr>
<tr>
<td>District 4</td>
<td>39</td>
</tr>
<tr>
<td>District 5</td>
<td>47</td>
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<tr>
<td>District 6</td>
<td>54</td>
</tr>
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<td>District 7</td>
<td>36</td>
</tr>
<tr>
<td>Utility System Totals</td>
<td>308</td>
</tr>
<tr>
<td>Overall Facility Rating</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Supply Facility</th>
<th>Overall Average Rating</th>
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</thead>
<tbody>
<tr>
<td>1988 Water Plant</td>
<td>3.4</td>
</tr>
<tr>
<td>1998 Water Plant</td>
<td>3.7</td>
</tr>
<tr>
<td>1999/2000 Water Plant</td>
<td>3.9</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>3.5</td>
</tr>
<tr>
<td>Ground</td>
<td>3.5</td>
</tr>
<tr>
<td>Elevated</td>
<td>3.5</td>
</tr>
<tr>
<td>Wells</td>
<td>3.5</td>
</tr>
<tr>
<td>Well Houses</td>
<td>3.5</td>
</tr>
<tr>
<td>Lift Stations</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- Investment and addressing the depletion of the system value over the years; and
- Annual condition report;
- Annual operational review.

BROOKLYN PARK, MINNESOTA

The city of Brooklyn Park utility staff has developed an effective program for disseminating information. Because of proper planning and communicating, the city has been able to maintain its infrastructure effectively, resulting in fewer than 20 reported water main breaks annually in a system containing 308 miles of water mains. This is low compared with many other cities discussed previously. Figure 4 is Brooklyn Park’s water distribution strategy map, which shows planned improvements into 2016. This allows for the coordination of water main replacement with road reconstruction, which results in reduced costs. Figures 5 and 6 show the condition comparison over the 20-year period from 1991 to 2011.

Brooklyn Park has also developed a comprehensive maintenance district program to clearly show the state of the water infrastructure (Figure 7). The city developed a rating system to highlight the areas of the system as adequate, marginal, or problematic. The same rating system is used for a comprehensive utility maintenance program for the water plant.

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MANKATO, MN

The key to effective communication is planning in advance and effective delivery. The city of Mankato used a 40-year planning horizon to win approval for a rate increase by showing the replacement costs for the water and wastewater utility based on 4% inflation to all stakeholders including the city council. A recently completed rate study established the fund reserve as an annual bond payment, 50% of operations and maintenance (O&M), and $500,000 for emergency repairs.

Figure 8 shows the revenue generated from three rate scenarios compared with the 40-year capital and O&M needs. This information, showing different levels of service, convinced all the stakeholders, including the city council, of the need for a rate increase for long-term viability of the utilities.

Rate study. Conduct a rate study to show the real cost of water. For many reasons it may be beneficial for a utility to hire an outside consultant to complete a rate study, which includes the development of realistic multiyear projections of revenues and expenditures, including infrastructure improvement needs. According to a study in Florida that analyzed the effects of a number of price blocks on residential blocks, the inclining block rate structure with more than three price blocks seems to create the strongest incentive to conserve water (Rawls et al, 2009). As long as cost and demand continue to shift, more frequent rate adjustments will reduce the lag in rate increases and ensure that rates are properly aligned with costs.

Citizen advisory committee. Customers are usually willing to pay for water system infrastructure improvements when they understand why they are needed. Water supply professionals have typically done an ineffective job of communicating the need. Setting up a rate committee or citizen advisory committee helps communicate the needs to elected officials. A rate committee representing members from industry, city council, citizens, and commercial interests can be formed to provide a base for broad support of a rate adjustment. The members of this committee will become the spokespeople for rate changes and will provide rational justification to elected officials making the hard decision about increasing the rates.

Community involvement. It is important to involve the communities to be served and treat them as partners. Many people are especially reluctant to give money to any organization for which they feel they have no choice or input on how the money will be used. Therefore it’s beneficial to engage stakeholders in decision-making processes by partnering with them to...
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give them confidence that their money is well spent. External stakeholders must be part of the process that is intended to provide a thoughtful public outreach approach.

Ballot measures to obtain funding approval for infrastructure improvements have been successful in several communities. From 2008 to 2011, ballots allocating funds to transit capital or operations had a 73% success rate (Conley, 2012). When need is clearly articulated, the public appears willing to pay for infrastructure improvements.

Public outreach program. There are various public outreach programs that a utility can implement to involve the community in the planning process. Three examples follow:

- setting up conferences, workshops, and retreats to educate and inform people, and solicit community input on specific policy, issues, plans, or projects;
- developing effective media relations strategies; and
- evaluating community-impact assessments by determining the effect of a certain project on the community and its residents’ quality of life.

CONCLUSION

Public water systems potentially face a significant increase in funding for maintenance and upgrading their infrastructure. The age and condition of the US infrastructure has been addressed by USEPA, AWWA, ASCE, USGS, the American Public Works Association, and others.

The need to replace the water supply infrastructure is increasing with a simultaneous decline in water demand, resulting in lower revenue. To fund improvements, financing is a key component of maintaining a sustainable water system. Most of the improvements discussed in this article will be funded by higher rates. Gaining acceptance from policymakers and stakeholders is an important step in achieving development of an adequate financing plan. Changing demographics and the present economic condition of the country will have an effect on financing options that will be acceptable to stakeholders and policymakers.

USEPA estimates that even with an annual 3% increase above inflation in public water system revenue, public water systems would still need an additional $45 billion annually to replace deteriorated pipes over the next 20 years. To accomplish closing this gap, here is a suggested strategy:

- communicate with stakeholders and policymakers,
- conduct a rate study to determine the real cost of water,
- form and facilitate a citizen advisory committee to address rate setting issues,
- develop a plan for community involvement and input into the rate setting process, and
- implement a public outreach program that is ongoing and transparent.

People are typically willing to provide support for a project, including paying more for water services, if they know the project’s importance. Having strong leaders who can effectively communicate the need to upgrade or replace infrastructure is critical in making the case and getting approval for funding. Acceptance of a financing plan can be accomplished by operating and maintaining the public water system efficiently and effectively and conveying these achievements to the policymakers and stakeholders.
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Can operators play a role in plant design?

By Naeem Qureshi

Operator involvement during all stages of water treatment plant design and construction produces favorable results. When operators have ownership in a project, they’ll go beyond the call of duty to efficiently operate the plant. Most operators have definite opinions but often hesitate to share those opinions. In small towns with limited budgets where operators must obtain management approval for even small expenditures, it’s difficult for operators to make decisions on equipment costing thousands of dollars.

A project designer is interested in the most efficient design, but usually isn’t experienced in plant operations and often doesn’t understand the operational aspects of design. Operators, on the other hand, want a design that’s easy to operate and maintain. That’s why it’s important to make use of operators’ knowledge.

GETTING BUY-IN

Because operators know they’ll be responsible for operating the plant after construction, they’re usually eager to provide input if encouraged to do so. A designer can take some simple steps to get buy-in from operators and enhance a project’s value.

Persuade utility managers to allow operators to attend periodic project progress meetings. Managers may need to be convinced of the advantages in doing this, especially in smaller cities.

Stress at the kickoff meeting that operator input is important and that the designer will listen to and address operator concerns. Emphasize that water plant design/construction is a team project, and the entire team, including operators, will work together to make the project a success.

Develop a personal relationship with operators by seeking common interests, a good icebreaker before starting a meeting.
Most people love to talk about their children and grandchildren. Knowing ages, names, activities, and current interests helps develop relationships with operators, but the interest must be sincere.

Create a learning environment by explaining plant design criteria, water chemistry, chemicals used, chemical equations and reactions, etc. Discuss treated water goals and applicable governing regulations and standards.

Assign tasks to operators to reward their desire to participate. One task may be to investigate the performance of the proposed equipment at other plants. Ask the operators to contact operators at other plants where the equipment is being used and ask how it’s working. Have the operators present their findings at progress meetings.

Encourage operators to discuss pros and cons with chemical suppliers and equipment manufacturers. Ask for the operators’ input at progress meetings.

Develop a plant visit data checklist. Accompany some operators to plants where the proposed equipment is installed to observe it in operation and discuss any equipment challenges. If the equipment the operators prefer can’t be provided, explain the reasons why. Don’t ignore their preferences. Cost may be an important factor in selecting the equipment.

Provide copies of 30 percent, 60 percent, 95 percent, and 100 percent plans and specifications to all operators for review and comment. This approach reduces plan review time.

“Create a learning environment by explaining plant design criteria, water chemistry, chemicals used, chemical equations and reactions.”

THE PLAN IN ACTION
This process was used with good results at a 500-gpm lime-softening plant in Central Minnesota. Some suggestions the operators made were invaluable. Long-term maintenance became an integral part of plant design, and operators took ownership of the project. Operators were provided a list of water treatment plants using the proposed chemical-feed pumps to be installed in the new plant, along with contact information. Operators evaluated peristaltic and diaphragm pumps and presented data at a progress meeting. Their recommendation of peristaltic pumps was accepted. The designer and operators visited lime-softening plants in Minnesota, North Dakota, and Wisconsin to review proposed equipment in operation and discuss the equipment’s performance. This exercise further built a trusting relationship. During a design review meeting, operators noted that windows located above 20-ft-deep filters would be difficult to clean. Therefore, a walkway was provided between the two filters, at minimal cost, to provide easy access for cleaning. The city’s only elevated storage facility was a 500,000-gal tank. The design hadn’t taken into account that at some point the tank would need to be painted. Based on operator review, a pressure-sustaining valve was installed so the tower could be taken out of service without disrupting adequate system pressures. In addition, two pumps were provided to pump lime sludge to the sludge ponds. Based on operator input, an overflow gravity line was provided for emergencies. When the first batch of hydrated lime was delivered, operators noticed moisture was causing the lime to bridge in the lime silo. Operators contacted the supplier and other installations to help find a solution and worked with the designer to remedy the problem.

A WINNING COMBINATION
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Bullert named Honorary Member

Bernie Bullert has received American Water Works Association’s highest honor with the designation of honorary member. In his career of more than 35 years in the water industry, Bullert led the water supplies for St. Paul and Minneapolis, the two largest water suppliers in the state in addition to serving as an engineering consultant who assisted other communities.

During his career, Bullert served on a number of AWWA committees at the association and section level. Bullert was chair of the Minnesota Section in 1993 and represented the section on the association board of directors from 2002 to 2005.

New positions

David Brown has joined Progressive Consulting Engineers, Inc. of Brooklyn Center, Minnesota, as a senior project manager in the water engineering group. Brown was president of Bluestone Engineering of Arden Hills, Minnesota, and is a licensed professional engineer in Minnesota, Wisconsin, North Dakota, and Illinois and has more than 20 years of experience in water treatment, pumping, distribution and storage planning, design, and construction services. He has also served as secretary-treasurer for Minnesota AWWA.

Gerald Holbrook, Dillon Domeier, Elizabeth “Betty” Humter, and Jenna Tulzert have joined Y. A. Robinson Engineering Ltd. of Ellensdale, Iowa, as project engineers.

John Chlebeck, previously a civil engineer at SEH, Inc. in Vadnais Heights, Minnesota, is now a senior engineer in water supply planning for the Metropolitan Council in St. Paul.

In memoriam

Former Oslo water superintendent Bob Carpenter died at the age of 81 on November 29. “Bobbie Carpenter was a real hard worker,” recalled a colleague, Carroll Flaten. “He used to keep that water plant running 24 hours a day in the summer all by himself and he had to fix the water breaks also. He never got any overtime for it, either.”

Wayne Enney, former utility operations manager for the city of Bloomington, died October 13. Enney was chair of the North Central (now Minnesota) Section of AWWA in 1987 and director from the Minnesota Section 1993-96. He received the section’s L. N. Thompson award in 1992 and the George Warren Fuller award in 1989. Enney worked for the Bloomington Utilities of Public Works from 1966 to 1996.

Carroll Flaten died at the age of 75 on February 28. Flaten had been the water superintendent at Stephen and plant operator at International Falls.
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A look at bottled water

Tap water vs. bottled water. The tensions between producers and advocates are often evident.

Karin Holt, manager of public affairs and communications for the Coca-Cola Company in Eagan, Minnesota, doesn’t think it needs to be this way. “We are by no means competing with tap water,” she says.

No doubt the tension will continue. Holt says that a “Cap the Tap” campaign by Coca-Cola, characterized by Andy Bellatti of Huffington Post as a “covert assault” on tap water, has been retired. She called Cap the Tap an “outmoded” program, a campaign aimed at Coca-Cola customers, such as restaurants, to “increase incremental sales of our beverages.”

Rik Schwarz, Coca-Cola’s director of sales for food service/ on premise, said, “Our job is to create revenue for our restaurant owners. There is nothing that talks about not getting them [wait staff] to not talk about tap water.” Schwarz also notes that free-style units they provide with around 100 beverage choices, including Dasani, Coke’s bottled-water brand, have an option for free tap water. He said restaurants, college campuses, and other sites for these machines wanted that option. Schwarz acknowledged that when he started at Coca-Cola 17 years ago, “we were probably against that,” but offering tap water as a choice in their free-style and fountain machines is something they are now happy to do. “It’s really about an informed choice.”

Holt understands that the Cap the Tap campaign was seen differently by many groups and says that is a “legitimate concern,” but she adds, “We don’t want to reduce the consumption of tap water. The Cap the Tap campaign was never intended to be a broad-based commercial thing. It was just a way for servers to say to people who asked for water, ‘Would you like something in addition to water?’ It wasn’t anything more than that.

“Companies are evolving in their viewpoints. It’s [Cap the Tap] something that isn’t even on our radar anymore. It’s something that hasn’t been used in years.”

Coca-Cola has more than 650 products and operates in 207 countries. Holt and others at the Midwest Coca-Cola Bottling Company of Eagan are aware of the issues, such as environmental and health concerns about plastic bottles, the impact on groundwater supplies, and the cost of a bottle of water in contrast to that of water from the tap.

“Water is a huge area of focus for us given that water is a tremendous resource for our company and our products,” says Holt. “It’s a key ingredient in all of our beverages. We want to become water neutral by 2020. To us, that means giving back to nature the same amount of water we use in our production and in our products.”

Holt explains that “giving back to nature” relates to investing in community water stewardship projects, including work with partners on farm-field management nutrient techniques, efforts to reduce runoff, ways to return water to nature, restoration of wetlands, and other water-conservation and replenishment projects. “We fund the projects, they [the partners] carry out the work. Coca-Cola receives water credits that offset the water it uses for its products.”

A recent project was a nutrient management plan in the Boone River watershed in Iowa to help farmers avoid over-application of fertilizer that can be detrimental to downstream water quality and to reduce nutrient loads that contribute to low-oxygen areas in the Gulf of Mexico that no longer support aquatic life. Partners in the project include Iowa State University, the Nature Conservancy, the Iowa Soybean and Corn Growers Association, and the U.S. Department of Agriculture Natural Resources Conservation Service.

Coca-Cola is also working to reduce the amount of water it uses in manufacturing facilities, the amount of plastic (which is free of bisphenol-a) in its containers, and waste in the production and transport of its products. In addition, the company has programs to encourage customers to recycle its bottles.

The Coca-Cola Foundation has been involved in disaster relief, such as donations of cash and in-kind contributions to the Philippines after Typhoon Haiyan last November. The foundation also works with organizations around the world to support initiatives that respond to community needs.

“We’ve brought healthy sanitation systems to a lot of countries that don’t have clean sources of water,” says Holt. “A lot of our investment in the Coca-Cola Foundation is through water stewardship and education. We’re out there trying to promote people drinking healthy water and having access to clean sources of water, and we’re funding the systems to monitor and help cleanse water that isn’t healthy.”

Coca-Cola’s sustainability report is available at http://tinyurl.com/mqku6bd.

Treatment

The Coca-Cola facility in Eagan uses municipal water for its employees and water drawn from the Jordan aquifer through noncommunity nontransient public water supply wells for its products. The water for Dasani is disinfected and treated with reverse osmosis and nanofiltration to remove impurities and has a small amount of mineral salts added to enhance taste. A company fact sheet says, “Because of purification and re-mineralized processes,
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Industry News

Dasani and our other purified water brands provide a consistent taste wherever they are purchased, regardless of their source.”

“It’s really not the same as tap water,” adds Holt.

Regulation

Public water systems are regulated by the U.S. Environmental Protection Agency (EPA), and bottled water is regulated by the U. S. Food and Drug Administration (FDA). In the case of the Minnesota bottlers, the water is regulated by both entities.

The Minnesota Department of Health, which enforces and administers the provisions of the EPA Safe Drinking Water Act (SDWA) in the state, has a memorandum of understanding with the Minnesota Department of Agriculture, the regulatory arm for FDA.

States have the option to regulate water-bottling facilities under the SDWA. Although the majority of states have not chosen to regulate bottled water, a number of them, including Minnesota, have.

“We have limited our authority to regulate water bottlers to only those that use a private well and not those that use municipal water as a water supply source,” said Jerry Smith, head of the Noncommunity Public Water Supply Unit at MDH. Of the approximately 20 water bottlers in the state, about 75 percent use their own water supply source.

“With a recent change in interpretation in how Minnesota Department of Agriculture is allowing the use of ‘treatment’ in the bottling process, MDH is re-examining the existing memorandum of understanding with them and how this may affect our inclusion of water-bottling facilities that obtain water from a municipal source,” Smith added. “Now, if city water is used for the product, we don’t regulate; the city water itself is already sampled and regulated.”

The Department of Agriculture continues to regulate and sample the finished product, covering the area of quality-control assurance.

Brenda Eschenbacher, a public-health sanitarian with the Noncommunity Unit, has been sampling water from the noncommunity wells before treatment. Eschenbacher notes that MDH regulation with bottlers pertains only to bottled water, not to beverages such as soft drinks, carbonated water, juices, and sports drinks.

Jim Roettger, the food standards compliance officer for the Minnesota Department of Agriculture, notes that after MDH determines that the bottler’s source of water is safe, his department will license the facility and monitor the finished product. The monitoring includes inspections of the bottling facilities and of the recordkeeping for sampling and laboratory analysis.

Roettger adds that they may pull a certain number of bottles and sample it in their own lab. The department rarely encounters a problem in the monitoring, and Roettger says that, in these instances, there are no contamination issues from a health standpoint; rather, the issue is mineral compounds that have only aesthetic effects.

Of the EPA regulations for public water supplies and FDA regulation of bottled water, Holt says, “The criteria are equally as stringent.”

Bottled Water Concerns

An FDA fact sheet includes a sidebar that reads, “Americans like bottled water. According to the International Bottled Water Association, bottled water was the second most popular beverage in the U.S. in 2005, with Americans consuming more than 7.5 million gallons of bottled water—an average of 26 gallons per person. Today, only carbonated soft drinks out sell bottled water.”

(Emphasis added by the FDA.)

Critics of bottled water maintain that the popularity touted in the FDA fact sheet points out the problem and call it “an advertising and marketing success” rather than a product that has risen in stature because of a need for it.

A Dasani “Myth versus Fact” information piece provided by Coca-Cola counters with the claim that bottled water is a personal choice and one that does not compete with tap water.

“It provides people with convenient access to clean, refreshing water that is easily portable in sealed containers. Bottled water offers a consistency of taste and often, it contains unique mineral content. For all of these reasons and more, people purchase bottled water to complement their use of tap water.”

On the criticism toward bottled water, Tim Wilkin, president of the Minnesota Beverage Association, says, “I think it is important to sort out the facts from the myths and make an informed decision. Our members’ products give consumers options that provide convenience and a consistent taste that they seek.”

MDH regulators say the question is not whether tap water is better than bottled water or vice versa. Rather, the emphasis is on customers being informed and not paying more for bottled water based on fears of the safety of tap water.

Representatives of Coca-Cola say they concur: “We’re all for informed choices.”

Blast from the Past: The Good Stuff

On the subject of bottled water, the Summer 2008 Waterline included a story on an event at Corner Table Restaurant in Minneapolis where city officials and restaurant owners announced support of tap water along with plans to reduce or eliminate the use of bottled water. “The city supports local businesses that are modeling best practices, such as removing bottled water from their menus,” said Cara Letofsky, the policy director for the office R. T. Rybak, then the mayor of Minneapolis. Corner Table Restaurant owner Scott Pampuch noted the high quality of Minneapolis tap water, which he called “an extension” of his restaurant. Common Roots Café owner Danny Schwartzman, along with Anne Hunt of the office of St. Paul mayor Chris Coleman and Amber Collett of Corporate Accountability International, also attended.
The Minnesota Department of Health (MDH) has produced a video to celebrate the 40th anniversary of the federal Safe Drinking Water Act in 2014. The video features interviews with Representative Betty McCollum and Steve Schneider, general manager of St. Paul Regional Water Services, as well as former governor Al Quie and former vice president Walter Mondale, who both represented Minnesota in Congress when the act was passed. The video will be available in different formats, including social media.

The Safe Drinking Water Act was passed in December 1974, but it was largely ignored at the time. It wasn’t even mentioned in some of the nation’s largest newspapers, such as the New York Times and Washington Post, nor in the major magazines, Time and Newsweek. It got more attention in Minnesota because of its impact on the state’s third-largest city, Duluth, which had just given the go-ahead for a new filtration plant to remove asbestos particles from the water. With the passing and signing of the law, the Environmental Defense Fund petitioned the U.S. Environmental Protection Agency (EPA) to use its emergency powers in connection with a number of cities, including Duluth.

To view the interviews online, visit www.youtube.com/watch?v=lnLwGZxSvRc&feature=youtu.be
Little Falls continues implementation of Wellhead Protection Plan

Little Falls, a central Minnesota city of 8,400, is midway through the implementation phase of its 10-year wellhead protection plan, developed with the Minnesota Department of Health (MDH) and set to expire in 2017. The city had fallen behind with implementation efforts but has made great progress thanks to a grant, a significant find, and dedicated employees. As part of implementing its wellhead protection plan, Little Falls has to seal unused and abandoned wells. “Unused, unsealed wells can provide an open channel between the surface and an aquifer—or between a shallow aquifer and a deeper aquifer,” said MDH hydrologist Geoff Nash. “An unused well can act as a drain, allowing surface water runoff, contaminated water, or improperly disposed waste to reach an uncontaminated aquifer.”

Recently a city employee came across a 1947 map showing the locations of these wells. Nash called it “the holy grail,” as it allowed the department’s Source Water Protection (SWP) Unit to assign unique well numbers. “It was an exact map of what they needed,” said Nash. “It just couldn’t have been any better.”

Little Falls then applied for and received an $8,300 implementation grant from MDH with money available from the fund established by the 2008 Clean Water, Land, and Legacy amendment to the state constitution. Some of the 12 abandoned wells were accessible via manholes, others were under buildings, and some under streets. Before tearing up pavement and concrete, the city wanted additional evidence of the locations of these wells. With a portion of the grant money, Little Falls hired 3Dgeophysics, Inc., of Chaska, Minnesota, to use a proton magnetometer with GPS. The magnetometer identified anomalies, produced by metal, in the earth’s magnetic field, a means of finding and confirming the location of the wells. The additional GPS capability allowed for a map to be made to provide a permanent record of the locations, necessary as the city is phasing in the well sealing over the next few years.

Of the four wells targeted for sealing in 2013, 3Dgeophysics found three. As for the other, it’s likely it was removed sometime in the past, possibly during a utility installation. Little Falls has applied for a well-sealing permit to MDH, which will evaluate the situation and determine the status of that well. Former wells 7, 10, and 12 were found. Well 7 was just outside of City Hall (which occupies a building that served as the water treatment plant from the time it was built in the 1930s until 1973). The well casing was only a few inches beneath the ground. Though filled with debris and gravel, the locating of the well was an “easy job,” according to Nash. Well 10 was under the basement of City Hall and also posed few challenges.

Well 12 was a tougher find. Curtis Wunderlich of the MDH Well Management Section, using a magnetometer at a location indicated by the 1947 well map and by a faint anomaly from 3Dgeophysics, found a Class V injection well. “The unexpected reuse of what was originally a brick well structure as a Class V well puzzled us at first,” said Nash.

Wunderlich suspected that the sediment, including a chunk of concrete, at the base of the Class V well was covering a well casing. Nash added, “We suspected that the chunk of concrete was part of a past well-sealing effort. Troweling or dumping concrete into the upper few feet of a well was a method of ‘abandoning’ wells before regulations.”

To avoid entering a confined space, Wunderlich lowered a magnetometer on a rope into the Class V well structure and found a magnetic signature for well 12 beneath it. “Curtis is like a bloodhound when it comes to locating wells,” said Dwayne Heinen, the assistant water supervisor for Little Falls. “He just doesn’t give up.”

The next day a city worker (complying with requirements for confined-space entry) moved the concrete to reveal a six-inch diameter pipe, from 1926, that was well 12. At that point, city crews put a sleeve over the casing to make for easier access for the drillers. Wells 7 and 12 were later cleaned of obstructions and sealed in accordance with the Minnesota Well Code by Northland Drilling of Randall, Minnesota.

Gail Haglund, Mark Wettlaufer, and Trudi Witkowski of the MDH SWP Unit noted the efforts of Heinen, who came on board in June 2011 just in time to be given the implementation duties. In addition to the well sealing, Heinen has been busy with educational activities, including nitrate clinics, and working with local units of government on the plan. “He didn’t just want to meet the minimum requirements;” said Witkowski. “He did more than was needed.”

Little Falls will be applying for additional grants to continue its program of sealing the rest of the wells. Nash notes that the city’s efforts are protecting the aquifers beneath it and ultimately its drinking water and public health. Heinen said the experience has reinforced the importance of protection efforts and the sealing of wells. “There can be a 100-foot pipe going right down into the aquifer. The possibility of contamination is high. It’s not just about one well. It’s about the entire area.”

On working with Little Falls, Nash said, “They went from nearly being out of compliance to being enthusiastically on board. It was a lot of fun to watch.”

Note: The MDH Well Management Section also has grants available for sealing public wells. For current information, go to http://www.health.state.mn.us/divs/eh/wells/sealing.
Compliance Corner

By Mackenzie Hales, Minnesota Department of Health

30 Hour Holding Time
As of January 1, 2014 bacteriological samples have to arrive at your designated lab within 30 hours of the sample being collected. All samples received more than 30 hours after collection will be rejected, and the sample will have to be recollected. If a valid sample is not collected during the compliance period, a monitoring and reporting violation will be issued and public notification will be required.

MDH has been notifying community systems when samples are received over 30 hours after they were collected. Please continue discussing shipping options with your assigned lab, and consider using another shipping method if your samples are consistently late. Proper planning can also help avoid exceeding the 30-hour limit. Check with local mail service options about pick-up times, as this may help you plan your sampling schedule. For example, if the truck comes to pick up packages at 4 p.m., sample in the early afternoon instead of in the morning to reduce the amount of time the sample sits outside of transport.

Bacteriological Repeat Sampling Procedure—Monthly Systems
If your system is collecting monthly bacteriological samples and you are notified of a positive for total coliform (E. coli absent), make sure you follow the proper repeat sampling procedures. Repeat samples must be collected within 24 hours after notification. Repeat samples should be collected at the original positive location, upstream, downstream, and at a random location. Groundwater systems must also collect repeat sample(s) from the well(s) that were pumping during the time the original positive occurred.

Bacteriological Monitoring and Reporting—Monthly Systems Submitting Paper Reports
MDH must receive monthly bacteriological/disinfectant residual reports from systems or labs by the 10th of the following month. For example, the January report must be received by MDH on or before February 10. Systems are responsible for making sure MDH receives the report, meaning that if you contract with the lab to send the report to MDH, you are still responsible for making sure it is sent and received by MDH. Electronic delivery is the best way to obtain confirmation. PDFs can be emailed to health.drinkingwateradvisory@state.mn.us.

2014 Drinking Water Institute to be held in St. Paul

Water Works! A Drinking Water Institute for Educators, held at the Cascade Meadow Environmental Learning Center Rochester in 2013, will be conducted at Minncor Industries this summer from Monday, August 4 to Wednesday, August 6. Each year Minnesota science teachers attend the three-day Institute, learning about drinking water and about ways to develop inquiry-based activities that can be incorporated into their existing science curriculum.

The program is free to interested teachers, who will receive college credit for their participation.

Water Works! is sponsored by the Minnesota Department of Health and the Minnesota Section of AWWA and is conducted through a partnership with Hamline University’s Center for Global Environmental Education. More information is available on the MDH website at http://www.health.state.mn.us/water/institute/index.htm.
Fluoride Source Water Survey

By David Rindal, Minnesota Department of Health Engineer

The January 2011 Health and Human Services proposed recommendation of 0.7 milligrams per liter (mg/L) fluoride in fluoridated community water supplies prompted several conversations about fluoridation in Minnesota. One topic of discussion has been the anticipated level of need for fluoridation given various potential optimum and minimum fluoride levels. In order to provide affected community public water system (PWS) owners and operators with information critical to fluoridation planning, MDH is facilitating a Fluoride Source Water Survey between January 27 and March 31, 2014. The results of survey will be used to determine needs and engineering considerations related to community water fluoridation.

Municipal and rural water community PWSs will be asked to collect raw water source samples from all active primary wells and surface-water intakes. Participating PWSs will notice a row named “Source Fluoride Investigation” on their 2014 Annual Monitoring Schedule. That row will include the scheduled date and number of active primary water sources to be sampled within a specific week between January 27 and March 31, 2014.

The Fluoride Source Water Survey procedure differs from standard fluoride compliance sampling in several other important ways:

- PWS operators must be careful to match MDH well numbers to corresponding PWS well numbers.
- Scheduled sample dates may fall on any weekday (excluding holidays).
- Source wells should be operated for at least 30 minutes or one casing volume prior to sampling.
- Combined transmission lines must be isolated to a single well and flushed at least one volume.
- Sources which are out of service must have their locations properly crossed out and initialed on the Environmental Health Laboratory request form.

MDH will ship sample materials (125 mL unpreserved bottles, lab request forms, bottle labels, mailing containers, mailing labels to participating community PWSs during January 2014).

If you have any questions regarding the Fluoride Source Water Survey, please contact me at 651-201-4660 or david.rindal@state.mn.us.
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<td>KLJ</td>
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<td>800-213-3960</td>
<td><a href="http://www.kljeng.com">www.kljeng.com</a></td>
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<td>KLM Engineering, Inc.</td>
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<td>877-959-7800</td>
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<td>M.E. Simpson Co.Inc.</td>
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