JOURNAL

OF THE NEW ENGLAND WATER ENVIRONMENT ASSOCIATION

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GOVERNMENT FUNDING AND REGULATIONS

Implementing Davis-Bacon related acts

Use of leveraging in the Massachusetts state revolving fund loan program

A multi-system approach to asset management in Franklin County, Maine

The domino effect—incentivizing planning to drive demand for water utility projects

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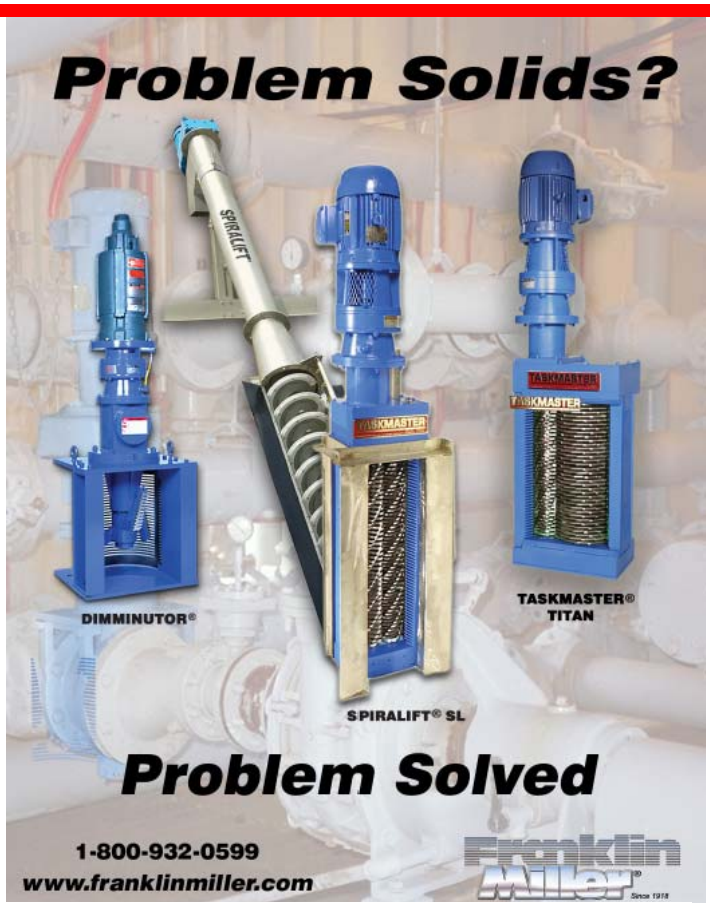

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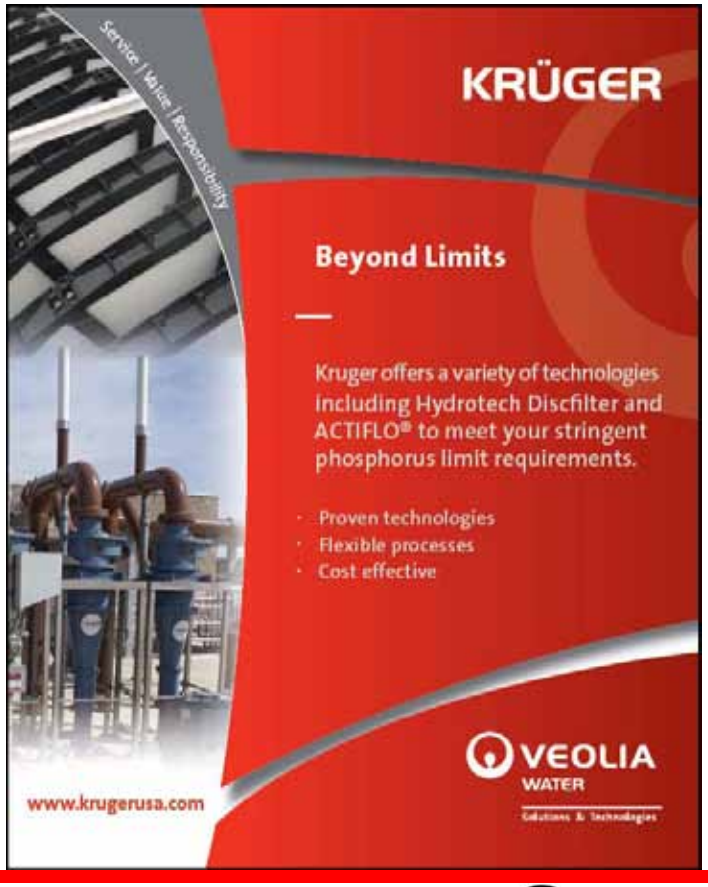

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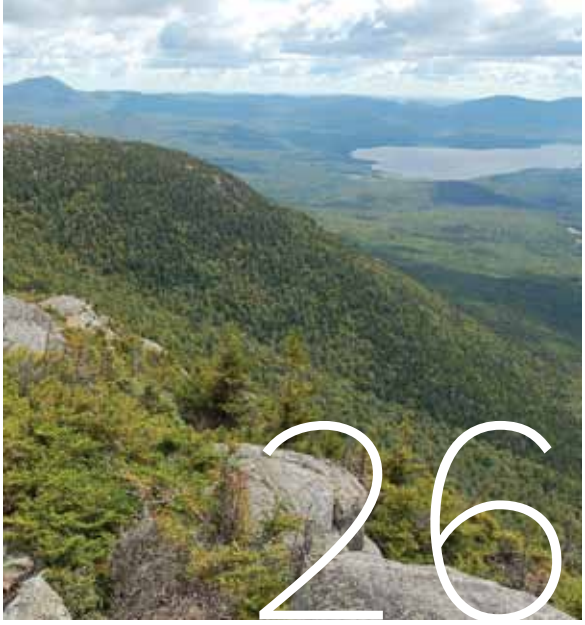

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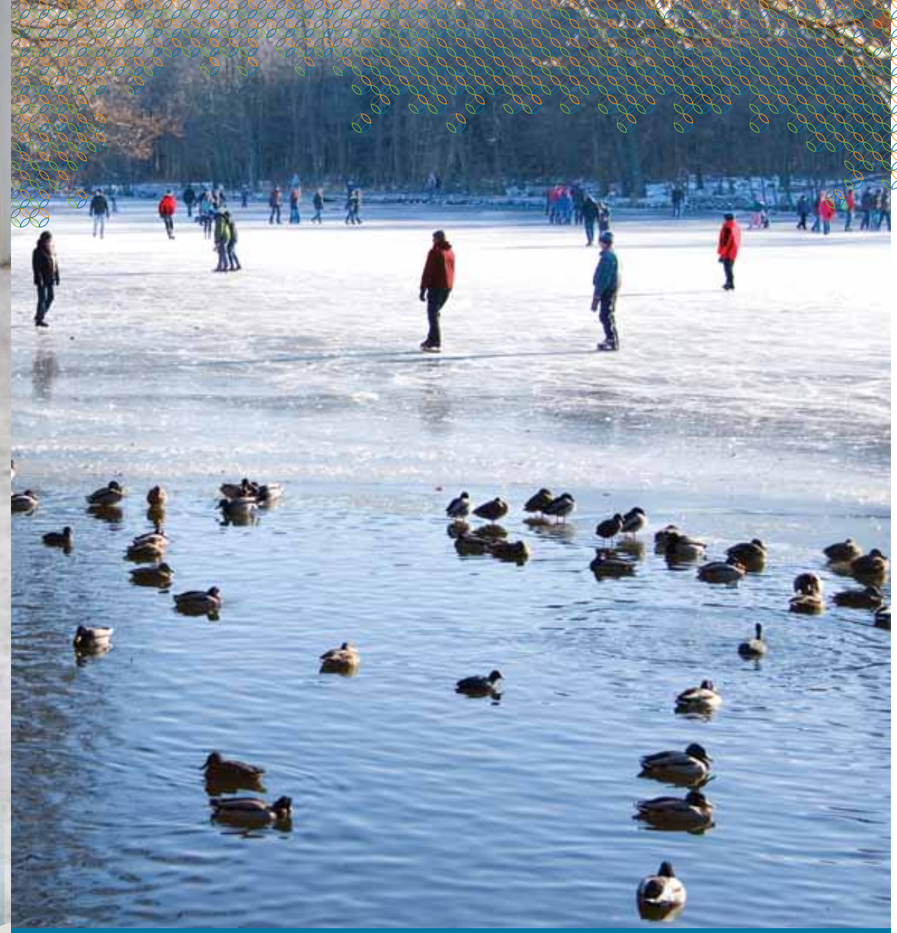

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President's Message
Water's Worth It

Dear NEWEA Member,
As I looked forward to my year as president, I was told it would go very fast, and I can now say, wow, was that ever accurate! The year flew by, as I moved from one NEWEA event to another, not to mention to the WEF and state association meetings and conferences. As you read this, we will have completed our 2014 Annual Conference at the Marriott Copley in Boston, and based on the planning that went into this event, I am certain it was outstanding.

A big thank you to all the committees that put on sessions and organized meetings and events. I must acknowledge the hard work of the conference committees, including Program, Sponsorship, Registration, Exhibits, and Awards, with special credit to Meeting Management Council Director Meg Tabacsko and Conference Arrangements Chair Ron Tiberi. Much appreciation to all!

This issue of the *Journal* focuses on two important and related areas: funding and regulatory issues. No doubt we are all aware of the need for increased funding to shore up our aging infrastructure and to make up for decreasing budgets and support from the federal government for the SRF Clean Water Fund. This belt-tightening trend is unlikely to change any time soon. Thus, it seems we have a choice: scream and shout that we need more funding (and likely watch it decrease anyway) or move forward looking for a new paradigm. I believe some of the new, creative funding programs are one key to future infrastructure investment. One example is "pay for performance," in which a vendor or manufacturer provides the up-front capital investment in return for a share of the savings the buyer gains from the installed technology. Public-private partnerships of all shapes and sizes are gaining traction, since there is private money available and seeking the solid return on investment that water and wastewater provide. Such alternative funding mechanisms, while perhaps not embraced now by all municipalities, will likely continue to increase as our infrastructure continues to deteriorate and public money remains insufficient to remedy the problems. For those struggling with insufficient financing, this trend can offer opportunities to move from a poorly public-funded environment to more innovative private fund-driven programs that can push our industry towards increased growth and improved performance.

Funding needs are, however, undoubtedly linked to regulations. As regulations evolve and new standards are presented, funding is needed to implement the increasingly complex technology to achieve the new regulatory standards.

The Marriott Copley in Boston location of the 2014 Annual Conference

We have lived in a world of regulatory silos, with drinking water, wastewater, stormwater, groundwater, surface water, wetlands, oceans, rivers, and streams all having their own regulations and oversight bodies. The trend toward watershed-based regulations is leading to a more holistic approach to regulatory limits. But this approach can only be successful if regulatory limits are sensible and adequate funding is available to achieve the desired goals. One-size-fits-all regulations will not work. For example, nutrient limits to protect Long Island Sound cannot be identical for shoreline communities and for communities hundreds of miles upstream in rural Vermont and New Hampshire. We must continue to work together so that science, regulations, and funding all function in harmony to achieve sensibly attainable results. We all want the same thing: protection and enhancement of our water environment. My hope is that stakeholders will continue to work reasonably together to develop the creative solutions necessary for achieving that goal.

We must continue to work together so that science, regulations, and funding all function in harmony to achieve sensibly attainable results. We all want the same thing: protection and enhancement of our water environment.

I proposed four initiatives at the beginning of my presidency: increase public awareness, enhance the value of membership, promote continued technical excellence, and have fun. These initiatives are really not so much new as they are an emphasis on that which we at NEWEA do every day. I hope that in the days, months, and years ahead we continue to keep our eyes on these initiatives. This organization has a wealth of talent and energy, and it is only through the cumulative contributions of the many that we thrive.

I cannot close without recognizing that the steady hand and firm resolve of Elizabeth Cutone has for many years been a key contributor to the success of NEWEA. On behalf of all members past and present, we thank you, E, for your leadership, wisdom, and friendship, and we wish you, Bob, and Michael much health and happiness during your retirement.

Thank you one and all for entrusting me with the presidency this past year, and I join you in looking forward to the future and working with our new leadership led by the gentleman from Bangor, Maine, 2014 President Brad Moore.

Mike Bonomo
2013 NEWEA President

NEWEA
WORKING FOR WATER QUALITY

From the Editor

For many years the U.S. has led the world in protecting water quality for human health and the environment. Yet we have all read the numerous articles that clearly show the ever widening infrastructure investment gap. To maintain the environmental and economic sustainability of communities in the U.S., this industry must learn to operate sustainable utilities.

What does that mean exactly? There are many schools of thought, but from this writer's perspective it means being financially self-sufficient at a local level and operating through asset management. The federal grant programs of yesterday will not be the answer for this generation. Utilities must reach out to their customers and work with the community to become partners in the resolution.

In an article by G. Tracy Mehan III, "The Business of Water: It is Time to Embrace a New Model for Water Services," he states: "While rates have been going up for some water and wastewater utilities, Americans still pay the lowest water rates of almost any developed country with very few exceptions such as Canada." He suggests that the new model for water utilities should be based on a philosophy of setting "rates to support a capital-intensive service, a much more sophisticated proposition than just selling a commodity." I tend to agree. We all have read the statistics of how much more Americans are willing to pay for cell phones, Internet, and TV than for water and wastewater. The AWWA and Raftelis Financial Consultants' 2010 Water and Wastewater Rate Survey shows the median affordability percentage for water and wastewater at 0.622 and 0.77 percent respectively. This is well below EPA's affordability guidelines of 2.5 percent for water services and 2 percent for wastewater services. Food for thought.

Helen T. Gordon,
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To confront the increasingly complex future of our industry, the 2013 winter issue of the *Journal* focuses on funding and regulations. The guest editor, Donald St. Marie, is MassDEP's northeast & western region SRF coordinator. He has pulled together perspectives from around the region highlighting some of the differences in the State Revolving Loan Fund (SRF) programs across states. Each article presents different ways funding programs have been crafted to support more projects with less money.

Massachusetts and Vermont officials discuss the funding of capital projects in their states. Massachusetts used the leverage approach to increase funding availability through the SRF program. The article from Vermont presents that state's approach of incentivizing planning prior to funding projects for construction and how it is working.

Our other government articles discuss varying approaches to supporting projects with a goal of increasing the focus on asset management and sustainable infrastructure. For example, in Franklin County, Maine, the Maine Rural Water Association used grant funding to conduct a multi-system asset management project to build capacity of the public water utilities in the area. One of the tools used was EPA's Check Up for Small Systems (CUPPS) asset management program.

The EPA article by Curt Spalding presents EPA's Climate Ready Utility Initiative. This initiative further supports EPA's focus on sustainable infrastructure.

Finally, an article presents ideas around community planning to address nitrogen loading regulations and reduce the cost of implementing wastewater infrastructure.

I hope you enjoy reading all the perspectives and approaches in this issue and that they spark ideas that will help you as you continue to work toward creating sustainable infrastructure in your community.

Helen Gordon
Journal Committee Chair and Editor

Read the NEWEA Position Paper—*Sustainable funding for improving our nation's water infrastructure* on page 48

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March 20, 2013

Industry News

Damage caused by flood waters from Tropical Storm Irene on the Ottauquechee River in Taftsville, Vt.

EPA awards almost $9 million in grants to researchers working to improve water quality

by Cathy Milbourn and Julia P. Valentine
Water Environment Federation, "This Week in Washington"

Answering the challenge in President Obama's Climate Action Plan, the U.S. Environmental Protection Agency (EPA) is spearheading a regional response to identify and launch actions to help New England communities become more resilient to climate change. Along with the six New England states, the Consensus Building Institute, Johnson & Wales University and the New England Interstate Water Pollution Control Commission (NEIWPCC), EPA held a Climate Leaders' Summit on Nov. 8, 2013, at Johnson & Wales University in Providence, R.I.

While all New England communities will likely be affected by increasing severe weather events, fewer than 10 percent have adaptation efforts underway. Quotes from the attendees at the Climate Leaders' Summit are noted below.

"As climate change continues to contribute to sea level rise and load the dice for more powerful storms, coastal New England homes and businesses will face increasing risk of damage," said U.S. Senator Sheldon Whitehouse, a lead advocate in the Senate for addressing climate change and cofounder of the Bicameral Task Force on Climate Change. "We must proactively work to bolster our coasts' natural defenses and make our communities more resilient to the harmful effects of climate change. I applaud EPA for convening this group of leaders from the region so we can work together to address this issue head on."

"Climate change is a reality, and we must face this challenge together," said Curt Spalding, regional administrator of EPA's New England regional office. "Like all environmental challenges, the impacts of climate change won't stop at political or geographic boundaries. We are committed to working together to overcome existing barriers, and develop high-level, systemic solutions."

"With more severe and extreme weather on the horizon we must take action to reduce the toll that changes in climate could take on our region," said Commissioner Daniel C. Esty of Connecticut's Department of Energy and Environmental Protection. "The storms of the past few years make clear the need to work closely with our communities on effective steps to protect property, infrastructure such as roads, rail lines, government facilities, and wastewater treatment plants as well as valuable natural resources."

"Maine's economy is intertwined with our natural resources and they rely on the 'built infrastructure' functioning properly," said Maine Department of Environmental Protection Commissioner Patricia Aho. "Our economic reliance on our built and natural resource environment means that decision-makers must address vulnerabilities and prepare for severe weather events. By bringing together key people, we can take next steps to develop specific tools, coordinate and recommend appropriate strategies, and identify potential challenges for natural resource and infrastructure decision-makers."

"When Governor Patrick announced that climate change adaptation is one of my office's top three priorities for the remainder of his term, he stressed that forming partnerships across all levels of government will be essential in meeting the coming challenges," said Massachusetts' Executive Office of Energy and Environmental Affairs (EOEEA) Secretary Rick Sullivan. "I am pleased that EPA is bringing together leaders from throughout the region to make sure we're all better prepared, and look forward to utilizing the tools developed at the Climate Summit to assist Massachusetts communities in creating a safer commonwealth."

"The New Hampshire Department of Environmental Services is working with communities across the state to help them better prepare for the "new normal" conditions that we have been experiencing due to climate change. By using existing planning tools communities can identify vulnerable infrastructure in their hazard mitigation plans and use their capital improvement plans to phase in necessary upgrades. This proactive planning will help New Hampshire communities become more resilient and reduce the expense of recovering from extreme weather events in the future," said Commissioner Tom Burack of the New Hampshire Department of Environmental Services.

"Climate change is one of the biggest challenges we face when it comes to ensuring the health and resilience of our natural resources, infrastructure and quality of life," said Rhode Island Department of Environmental Management Director Janet Coit. "Kudos to EPA for bringing together partners from across New England at today's summit to develop an action plan that will address the impacts of climate change on our region."

"In Vermont, we have learned from our experience responding to Tropical Storm Irene that collaboration by local, regional, state and federal governments is critical to our ability to respond effectively to the impacts of the global climate disruption we are currently experiencing," said David Mears, Vermont's Environmental Conservation Commissioner.

WEF announces new executive director

Dr. Eileen O'Neill

On February 3, 2014, the Water Environment Federation (WEF) formally announced that Dr. Eileen O'Neill has been named the new executive director. O'Neill replaces Jeff Eger, who resigned in July 2013. Dr. O'Neill has been serving WEF as interim executive director since Mr. Eger's departure, and prior to that, she was deputy executive director. "Dr. O'Neill is an experienced association executive with strong water-sector knowledge based on diverse domestic and international experience," said WEF President Sandra Ralston. "She has a proven track record during her 20-plus years with WEF delivering highly successful technical programming, increasing revenues and building partnerships."

Before becoming deputy executive director in 2011, Dr. O'Neill served as the organization's chief technical officer, overseeing WEF's technical, international, and communications programs. In the past several years, she has been instrumental in creating national and international thought-leadership programming at WEF's annual conference, WEFTEC, the largest annual water quality conference and exhibition in the world. Before joining WEF she worked as an academic and environmental consultant in the U.S. and Europe. She has a bachelor of science in soil science from the University of Newcastle-upon-Tyne (U.K.) and a Ph.D. in soil science from the University of Aberdeen (U.K.). She also undertook a postdoctoral traineeship in environmental toxicology at the University of Wisconsin at Madison.

"Dr. O'Neill has consistently led WEF operations to be more strategic and data-driven, which aligns WEF with industry trends and the changing needs of utilities and global professionals. She has worked for an enhanced and more forward-looking volunteer experience," said President Ralston. "Her sincere appreciation of and partnership with the volunteer leaders is inspiring."

"I am honored by this appointment to a leadership role in such a great organization," said O'Neill. "It is especially exciting to serve the water profession and sector in such a time of change and opportunity. The vital role that water services play in communities is becoming increasingly clear and the need for innovative thinking and practices more widely recognized. I have no doubt that the collective talents of our members and volunteer leaders working with WEF's dedicated staff will allow WEF to play a key role in ensuring that the promise of these new approaches is realized."

National water policy forum & fly-in

Water Environment Federation, "This Week in Washington"

The Water Environment Federation, Water Environment Research Foundation and National Association of Clean Water Agencies are joining forces to present the National Water Policy Forum & Fly-In, April 7-9, 2014, in Washington, DC. The anchor events of Water Week 2014, the Policy Forum & Fly-In will bring together water and wastewater professionals from across the country to meet with members of Congress and federal regulators to share perspectives on federal clean water policy. The two-and-a-half-day agenda will feature Congressional speakers, policy briefings, visits to Capitol Hill, and roundtable dialogues with key policymakers. On April 9 Congress will host a Water Infrastructure & Innovation Expo. Part of Water Week 2014, the expo will provide an opportunity for members of Congress, Congressional staff, federal agency employees, and the public to visit booths and displays of major water associations, federal agencies, foundations, technology innovation organizations, and engineering firms. Additional information about Water Week 2014 will be available at WaterWeek.us.

Courts strike down stormwater fees

Water Environment Federation, "The Stormwater Report"

In mid-November 2013, the Missouri Supreme Court ruled that the St. Louis Metropolitan Sewer District (MSD) stormwater fee is actually a tax, which violates the state's constitution because it was established without voter approval. The court opinion states, "A tax by any other name remains a tax. It cannot be transformed into a user fee by adept packaging any more than a zoologist can transform a horse into a zebra with a bucket of paint. Here, no matter how many stripes MSD paints on it, the stormwater user charge is not a user fee." The stormwater fee, based on impervious surface area and established in 2008, was intended to help the sewer district raise nearly $60 million per year to address stormwater budget shortfalls.

There have been a number of court cases on stormwater fees in recent years. In another case, decided in September 2013, an Ohio appeals court struck down the Northeast Ohio Regional Sewer District's stormwater fee, ruling that the sewer district did not have the authority to enact a regional stormwater management program fee. The Northeast Ohio Regional Sewer District is currently obligated to a $3 billion combined sewer overflow (CSO) long-term control plan, Project Clean Lake. The decision hinders the ability of wastewater utilities to address CSOs and is important because it could serve as a legal precedent outside Ohio. The National Association of Clean Water Agencies and the Association of Ohio Metropolitan Wastewater Agencies filed an amicus brief in the Ohio Supreme Court to appeal the ruling.

Implementing Davis-Bacon related acts

KATHLEEN A. BOURRET, New Hampshire Department of Environmental Services SRF Program

ABSTRACT | Monitoring and enforcing the provisions of Davis-Bacon Related Acts (DBRA) has been a challenge for many participating in federally funded programs. The American Recovery and Reinvestment Act (ARRA) brought a heightened requirement for transparency and accountability, forcing full compliance with DBRA. Part of the difficulty of persuading stakeholders to abide by DBRA provisions is the seemingly illogical differences in wage rates among the various jurisdictions as well as the reluctance of some to acknowledge the wage provisions since there is no perceived value added from DBRA, only costs. The law was enacted to protect local contractors from unfair competition. Today, the regulation tends to have the opposite effect. Small local contractors and disadvantaged enterprises are less likely to bid on a project fearing that inflated labor and added administrative costs will deplete the potential for reasonable profit. Prevailing wages are determined by the Department of Labor (DOL) from surveys of contractors that worked on both federally and non-federally funded projects as well as from interested third parties. The methodology to determine prevailing rates is patently flawed. Limited contractor participation in the survey results in prevailing wages skewed toward wages paid by those contractors that responded and not representative of wages in the survey's geographical area.

KEYWORDS | Davis-Bacon related acts, compliance, prevailing wage, contractors, federal and federally financed projects

BACKGROUND

Implementing DBRA successfully involves continuous interplay among the state, the consultant and the general contractor throughout a project. Typically, responsibility for DBRA compliance is passed from the project owner to its consulting engineer through a contract for services. Under this scenario, the consultant is responsible for ensuring that the proper general wage determination (GWD) is applied based on the nature of the project. The decision on which GWD applies is generally made during the design phase.

IMPLEMENTATION

Some projects require a second wage decision. Application of more than one GWD to a project must be supported by identifying and analyzing construction items that fall into other categories and compose a large part of the project (more than 20 percent of the total project costs and/or at least $1 million). A $13 million project to upgrade a wastewater treatment facility can easily warrant carrying both "building" and "heavy" GWDs. Once multiple classifications are justified and applied, the consultant must clarify the work that will fall under each wage schedule and include the instructions in the bid specifications along with the applicable GWD. The consultant's explanation of the segregation of work may state, for example, "Work associated with the return activated sludge wet well, sludge storage tank No. 1, sludge storage tank No. 2, and sludge blend tank shall use building wage rates, as they are all attached to the administration and control building. All work associated with the primary clarifiers, secondary clarifiers, and gravity thickeners will use heavy wage rates." Contractors need this information to develop labor cost estimates.

Multiple wage determinations can be problematic if their application to the work is not clearly communicated from the beginning. Agency Memoranda 130 and 131 provide strong guidance to stakeholders in making these determinations, and the author stresses the importance of deciding the correct GWD(s) to apply early in the process. 29 CFR 1 provides that, "if a GWD is incorporated that does not apply to the project the funding agency is required to terminate and re-solicit the contract, or incorporate the valid GWD retroactive to the start of construction through a change order or supplemental agreement." If the GWD is replaced with the correct one, the contractor is to be compensated for increases in wages resulting from the error. Once the wage decision(s) is in place, the consultant must make sure that the bid documents have the most up-to-date version of the applicable general wage determination, and other stakeholders should monitor the DOL Web site, wdol.gov, for changes up until the time of award.

Good communication during solicitation and before construction is critical to averting issues of non-compliance later in the project. During solicitation, interactions with contractors enable the consultant to reiterate that the project is covered by DBRA provisions and specify which schedule(s) apply. The clock on possible rate changes continues to tick until the project is awarded.

Once the contract is awarded, the pre-construction meeting should include agenda items that expound on the administrative requirements and educate the contractor on the contracting agency/consultant's expectations. Stakeholders should discuss the provisions in detail, air potential administrative shortcomings, point out subcontractors new to rated projects, and inquire as to what classifications may be missing from the wage decision.

The contractor is obligated to determine if classifications are missing from the wage decision that will be needed to perform the work, initiate the requests for wage rates for those classifications, and propose rates based on the applicable GWD. These requests cannot be made until the contract is awarded; however, they should be turned around quickly to avoid delays that may lead to restitution. Under the provisions it is also the general contractor's responsibility to educate subcontractors and include the Federal Labor Standards in all subcontracts. Proposed rates must meet DOL guidelines for requesting conformances. Without accurate wage information, subcontractors are more likely to underestimate labor costs, which will ultimately reduce profits from the job.

CONSTRUCTION BEGINS

Once construction begins, the contractor maintains a record of laborers or mechanics on-site. This documentation ensures the collection of all certified payrolls for submission to the contracting agency. If the contractor's superintendent does not track the classifications that each individual may work in throughout the day, the employer should instruct employees to track their own work and avoid making the project non-compliant due to misclassification and possible underpayments.

Ideally, the consultant will have contracted for the services of a full-time resident project representative (RPR) to perform on-site monitoring of construction. The RPR's daily records provide a snapshot of the work and identify all contractors working on site. This documentation should be referenced while reviewing the certified payrolls to confirm that the proper worker classifications are included for the work performed in the specific time and also that prevailing wages were paid. Postings, including all applicable GWDs, and DOL Form WH-1321, Notice to Employees Working on Federal and Federally Financed Construction Projects, must be located in an easily accessible area to be viewed by employees.

EPA State Revolving Fund grant conditions include a requirement to periodically interview covered employees to verify that contractors or subcontractors are paying the appropriate wage

EMPLOYEE RIGHTS
UNDER THE DAVIS-BACON ACT
FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

PREVAILING WAGES	You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.
OVERTIME	You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.
ENFORCEMENT	Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.
APPRENTICES	Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.
PROPER PAY	If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor's Wage and Hour Division.

For additional information:
1-866-4-USWAGE
(1-866-487-9243) TTY: 1-877-889-5627
WWW.WAGEHOUR.DOL.GOV

United States Department of Labor worksite informational poster

rates. By interviewing employees immediately after observing them perform skilled or unskilled tasks, the consultant can reliably assess risk and discover discrepancies between the job classification and/or the actual wage paid for the work being performed and the classification/wage being reported on the certified payrolls. Confidentiality must be maintained or the fear of reprisals will make it unlikely the employee will be forthcoming. The information gathered during the interview can then be compared to the certified payroll submitted for the same date to confirm accuracy.

Certified payrolls and related documentation must be kept on file by both the contracting agency and contractors for three years from project completion. During this time a number of interested parties may request this information, including DOL Wage and Hour Division, EPA Office of Inspector General, labor unions and organizations.

Having a plan to incorporate DBRA compliance controls early in the project's life cycle will ease the administrative burden from the beginning. It is important to clearly define who will be responsible for each required task and, when questions arise, to reach out for assistance to the state agency funding the project or to DOL. Compliance activities should be a part of a weekly routine. If problems are resolved as they occur, the potential for delayed pay requests or disbursement requests can be minimized.

NOTES

- Whittaker (2007) In the construction field, it was alleged that migratory contractors from low-wage sections of the country would bid for federal work and, because they paid wage rates lower than those prevailing in the locality of the project (and employed nonresident workers), they enjoyed a competitive advantage over "fair" local contractors. (p. CRS-2)
- As reported in the April 6, 2011 Government Accounting Office publication, "Davis-Bacon Act: Methodological Changes Needed to Improve Wage Survey, Little incentive to participate in Labor's Davis-Bacon wage surveys and a lack of transparency in the survey process remain key issues for stakeholders.
- For contracts entered into pursuant to competitive bidding procedures, an exception provides that wage determination updates issued less than 10 days before the opening of bids shall be effective unless there is not a reasonable time before bid opening to notify bidders of the update, and a report of the finding to that effect is inserted in the contract file.
- If the contract is not awarded within 90 days after bid opening modifications to the wage determination(s) must be incorporated into the contract up to award, unless the contracting/assisting agency requests and obtains an extension of the 90-day period.
- All Agency Memorandum 213 Application of the Davis-Bacon and Related Acts requirement that wage rates for additional classification, when "conformed" to an existing wage determination, bear a "reasonable relationship" to the wage rates in that wage determination
- According to the 2013 Prevailing Wage Resources Book, Investigative Procedures Under DBA/DBRA/CWHSSA, Subcontracts, the labor standards provisions require the contractor to insert the labor standards clauses in any subcontract. This clause further stipulates that the prime contractor shall be responsible for compliance by any subcontractor with the labor standards requirements in the contract.
- The term laborer or mechanic includes at least those workers whose duties are manual or physical in nature (including those workers who use tools or who are performing the work of a trade), as distinguished from mental or managerial.

REFERENCES

- 29 C.F.R. § 1.6(a)(2)(i)(A) (7-1-11 Edition). Retrieved from: gpo.gov/fdsys/pkg/CFR-2011-title29-vol1/pdf/CFR-2011-title29-vol1-sec1-6.pdf
- US Department of Labor, elaws First Step Poster Advisor. Retrieved from: dol.gov/elaws/firststep/poster_direct.htm?p_sca=1
- 29 CFR § 5.2(m) (7-1-09 Edition). Retrieved from: gpo.gov/fdsys/pkg/CFR-2009-title29-vol1/pdf/CFR-2009-title29-vol1-part5-subpartA.pdf
- CRS Report 94-408, The Davis-Bacon Act: Institutional Evolution and Public Policy, by William G. Whittaker. Retrieved from: congressionalresearch.com/94-408/document.php
- April 6, 2011 Government Accounting Office publication, "Davis-Bacon Act: Methodological Changes Needed to Improve Wage Survey. Retrieved from: gao.gov/assets/320/316836.pdf
- 2010 Prevailing Wage Resources Book, Investigative Procedures Under DBA/DBRA/CWHSSA. Retrieved from dol.gov/whd/recovery/pwrb/Tab17DBInvestigt.pdf
- Conformance. Retrieved from: dol.gov/whd/recovery/dbsurvey/conformance.htm

ABOUT THE AUTHOR

Ms. Bourret, a human resources professional, is a federal program compliance specialist for the New Hampshire Clean Water and Drinking Water State Revolving Fund (SRF). She also worked at the Governor's office overseeing Davis-Bacon compliance for the Office of Economic Stimulus.

Use of leveraging in the Massachusetts state revolving fund loan program

JOSEPH E. DELANEY. Massachusetts Department of Environmental Protection, Boston, MA

ABSTRACT | The Massachusetts clean water and drinking water state revolving fund (SRF) loan programs provide low interest-rate financing for drinking water and wastewater projects throughout the commonwealth. Massachusetts leverages federal grant funds to increase the amount of financing available to communities.

KEYWORDS | Infrastructure financing, leveraging, drinking water, wastewater, state revolving fund, state match

The Massachusetts State Legislature established the state revolving fund loan program in 1996, having realized the need for infrastructure financing far exceeded what would be made available through capitalization grants. —The Massachusetts State House, Boston, Massachusetts

INTRODUCTION

Massachusetts' state revolving fund (SRF) is one of the most successful SRF programs in the nation, providing around $400 million annually in low interest-rate financing to cities, towns, and water and wastewater districts. Since its inception, the program has made nearly $6.8 billion in loans. If not for leveraging, the commonwealth could not have reached and maintained this level of funding for so many years and would have left significant environmental and public health problems unaddressed.

In 1988, the U.S. Congress passed legislation establishing the Clean Water SRF loan program to provide below-market interest-rate financing for wastewater infrastructure projects. This program replaced the Construction Grants program in place since the early 1970s. Under the SRF program, each state receives an annual capitalization grant, supplemented by 20-percent state matching funds to establish and maintain a loan program. In 1996, the Drinking Water SRF was established to provide financing for drinking water infrastructure.

The clean water and drinking water SRFs are jointly administered by the Massachusetts Department of Environmental Protection (MassDEP) and the Water Pollution Abatement Trust (the Trust). MassDEP manages the project selection, development, and construction while the Trust manages the execution of loan documents, disbursement of funds to the borrowers, and collection of loan repayments.

At the time of the SRF passage, Massachusetts had many large projects underway and realized the need for infrastructure financing far exceeded what would be made available through capitalization grants. To meet this need, Massachusetts instituted leveraging to increase the supply of financing available to communities in the commonwealth.

The Boston Harbor cleanup would have vastly outstripped the supply of funds available through the federal capitalization grants and state-matching funds

FINANCING MODELS

When the SRF legislation was passed, there were two models for establishing the loan program—a direct loan program or a leveraged program. The basic tenets of both programs are discussed below.

DIRECT LOANS

Many states established their SRFs as direct loan programs. Under this program, the maximum value of loans made in any given year totals the amount of money received from the federal grant, required state matching funds, and funds paid back from previous loans. As an example, assume a state receives a $50 million federal grant and provides the required 20-percent match of $10 million. In the first year the state can loan $60 million. If the grant amount remained constant from year to year, in the second year the state could loan the same $60 million plus the amount paid back on the first $60 million of loans. If the terms of the first round of loans were 2-percent interest for 20 years, the amount paid back in the first year would be about $3.67 million, so the total amount of loans in the second year would be $63.67 million. Again, assuming the grant amounts remain constant, the program capacity would grow each year by the increased amount of debt service paid back into the system from borrowers from each round of loans. This results in a slow and steady increase in program capacity. After 20 years (the payback term of the loan), the program grows more slowly because the first set of loans has been paid off and those paybacks no longer build equity in the program. Using this constant grant value, at the end of 20 years the program would have a capacity of about $185 million.

LEVERAGING

Leveraging increases loan program capacity significantly in the early years and maintains or increases those levels over time. Instead of directly loaning the grant and state-match proceeds, leveraging uses the proceeds as collateral for the sale of bonds. The state determines how much leveraging may be done. In Massachusetts, the SRF program may leverage up to 300 percent, meaning the program may sell bonds for up to three times the amount of money held as collateral (federal grant, state 20-percent match, and recycled funds from earlier loans). Using the same example as above, in the first year of the program the $60 million in capitalization grant and state match would be held as collateral for the sale of up to $180 million in bonds. Under the direct loan model, $180 million of annual capacity would not be reached until the 20th year of the program. As the borrowers pay back the loans, the proceeds of these payments go to pay the bondholders. As the bonds are paid off, a portion of money held as collateral is released back to the program. This money can then be used to increase program capacity. Using the same 20-year loan term described above, one-twentieth of the funds held as collateral are released back to the program each year for use as future loans. This means that $3 million of the first grant will be freed up for the second year, resulting in $63 million held as collateral for the second bond sale and up to $189 million of bond proceeds. As this demonstrates, leveraging allows the SRF program to build capacity quickly to address a large backlog of needs. Using all the same variables as above, after 20 years this theoretical leveraging program could provide as much as $454 million per year in program capacity versus the $185 million per year in the direct loan program

MASSACHUSETTS LEVERAGED PROGRAM

From the SRF program's very beginning, Massachusetts realized the need for increased funding. Projects such as the Boston Harbor cleanup and the start of very large combined sewer overflow projects would have vastly outstripped the supply of funds available through the federal capitalization grants and state-matching funds. Massachusetts moved immediately to leveraging to help close this funding gap.

While the leveraging is generally straightforward, the reality is it is often is a little more complicated. In Massachusetts, the standard SRF loan, by statute, is a 2-percent interest rate for 20 years; although, terms of as few as five years and as many as 30 years are allowed under certain circumstances. When bonds are sold, the interest rates on those bonds depend on the market. Even with an AAA rating and a low interest-rate environment, the Trust still sells long-term bonds for between 3 and 5 percent. Since SRF borrowers pay only 2-percent interest, the spread between 2 percent and the market rate must be paid by someone. Part of that payment comes from investment earnings. Massachusetts can legally invest the funds held as collateral on the bond deal, as long as it reinvests those funds back into the SRF program. These funds are invested in various ways, and the interest earnings help defray the cost of the bonds. The remaining amount of interest is paid by the state under a 20-year contract. This insures that the full amount of the principle and interest associated with the deal are safeguarded for bond purchasers. This contract assistance is an annual line item in the state budget that covers the remaining spread between 2 percent and the market rate. Massachusetts budgets about $63 million per year to subsidize existing SRF loans.

The Massachusetts SRF program can legally leverage up to three times the available funds. Whether or not the maximum leveraging is done in any given year is subject to many variables. The amount of the federal grant, the number of projects moving toward construction, interest rates, and the availability of contract assistance all weigh in on how much money is borrowed in any given year. In recent years the Clean Water Program has been leveraging between 2:1 and 2.5:1, while the Drinking Water program generally leverages to its maximum 3:1 capacity. The Drinking Water SRF has used the higher leveraging ratio because program capacity has not been built to that of the Clean Water SRF. The Clean Water SRF is eight years older than the Drinking Water SRF, and its grants have historically been much higher than the Drinking Water SRF.

PROGRAM RESULTS

The Massachusetts SRF Program has loaned out nearly $6.8 billion since its inception. Of this amount, nearly $4 billion is due to leveraging. Massachusetts has received $1.71 billion in federal grant funds since the start, so for every dollar of federal investment almost four dollars of projects have resulted. The Environmental Protection Agency ranks Massachusetts third among states that leverage.

As the SRF Program has matured, federal grants make up a smaller and smaller percentage of financing offered each year, while repayments from borrowers make up a larger percentage. For fiscal-year 2013, Massachusetts received a federal Clean Water grant of $45.3 million and a Drinking Water grant of $15.7 million. Through leveraging, MassDEP could offer financing of $391 million and $121 million in Clean Water and in Drinking Water projects, respectively. In this case, each federal dollar results in more than eight dollars of projects.

CONCLUSION

Massachusetts' significant need for wastewater and drinking water financing led it to leverage the SRF program. This allowed the commonwealth to quickly address this need and maintain a high level of financing throughout the program's history. Massachusetts has demonstrated a strong commitment, through its annual appropriation of 20-percent state match and contract assistance debt subsidy. The consequent availability of the leveraging model has helped the commonwealth address demand for wastewater and drinking water financing while helping to mitigate serious environmental and public health issues.

ABOUT THE AUTHOR

Mr. Delaney is the deputy director for the division of municipal services at MassDEP. For the last eight years he has been part of the State Revolving Fund Loan Program management team that provides over $400 million per year in financing for wastewater, drinking water and stormwater projects throughout Massachusetts. Before joining MassDEP, he spent more than a decade as the town engineer for Reading, Mass. where he oversaw the design and construction of municipal infrastructure projects and spearheaded the development of one of the first stormwater utilities in Massachusetts. He also spent a number of years in the private sector working as a civil and environmental engineering consultant with Arthur D. Little, HMM Associates, and CDM Smith. He holds a bachelor's degree in civil engineering from Northeastern University and is a registered professional engineer in the Commonwealth of Massachusetts.

FEATURE

A multi-system approach to asset management in Franklin County, Maine

ALEX WONG, Maine Rural Water Association

ABSTRACT | In 2012, the Maine Drinking Water Program, using a portion of its 15-percent Drinking Water State Revolving Loan Fund (SRF) set-aside, created a grant program for a regionally based asset management assistance program. Working under this grant, the Maine Rural Water Association (MRWA) targeted Franklin County, Maine for a unique approach to building capacity of the public water utilities in the area. We were uniquely positioned to assist with training and technical assistance of asset management plans for the rural water provider in Franklin Co. MRWA has been a constant presence in these utilities for more than 30 years, providing a multitude of services, including grants, rates, training programs, etc. All the utilities in Franklin County are long-standing members of our association, and there is a high degree of mutual respect and trust. The following describes the program, our activities, and future goals.

KEYWORDS | Asset management, drinking water state revolving fund, Maine, rural water, training programs, CUPSS (check up for small systems)

Maine State House, Augusta, Maine

BACKGROUND

Asset management is a systematic approach to examine and track infrastructure capital assets, minimizing the total cost of operating a system while maintaining a desired level of service. It also provides a framework through which operations, maintenance, repair, and capital expenses are viewed as investment decisions. Asset management increases local capacity by allowing utilities to budget for replacement of infrastructure in an orderly fashion, increasing their ability to sustain operations for the long-term.

A proper asset management plan is based upon an inventory of infrastructure capital assets, with an accurate valuation and anticipated life expectancy; it actively tracks inventoried assets and continually updates inventory with new information. It is a running tally of the total cost of operating a water system. In addition to increasing operating efficiency, an asset management plan will help guide trustees in assembling short- and long-term capital improvement plans and prepare them for the rates necessary to support that investment.

Development and implementation of asset management has been problematic in our rural communities due to lack of time, fiscal constraints, expertise, and training for operators and trustees.

Franklin County is home to 11 Maine Public Utility Commission (MPUC) regulated community water utilities serving a population of nearly 16,000 residents. Ten of these systems use groundwater as their primary source. Three systems serve more than 1,000 residents and only one serves more than 3,300. Four of these systems have substantially improved their infrastructure in recent years; however, many of these utilities have antiquated infrastructure. The remaining seven systems serve fewer than 1,000 customers.

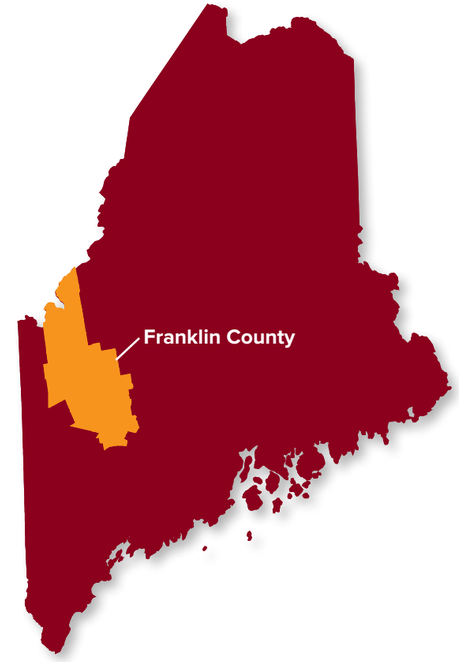
According to the water utilities' annual reports for the Public Utilities Commission, these 11 systems have combined assets worth $24.7 million. The water systems have 121 miles of transmission and distribution mains, 12 finished water storage facilities with a total capacity of nine million gallons, and 4,759 water meters. Service is provided to users by fewer than 25 full-time employees.

THE PROJECT

MRWA conducted a bifurcated training and technical assistance program with both a broad reach and targeted assistance. MRWA held an initial organizational meeting (not part of the grant), which was instrumental in generating interest and helped set the stage for the eight-hour general training. The broad training consisted of a two-part class for the 11 MPUC regulated utilities. The first four-hour class introduced asset management for the drinking water industry. Environmental Protection Agency (EPA) Simple Tools for Effective Performance (STEP) guides and other resources, such as the New Mexico Environmental Finance Center, were used to present physical asset management and how it relates to sustainability. Attendees participated in group exercises that developed a hypothetical system by defining a level of service, defining and inventorying assets, rating conditions, rating criticality, and costing asset life cycles. Tools to develop a plan and program were also introduced.

The second four-hour class picked up where the first left off. Asset management tools, from free ones such as Excel spreadsheets, access databases, or software like Check Up for Small Systems (CUPSS) to proprietary software for asset management were introduced and demonstrated. Attendees participated in a hands-on planning exercise using two computer-based tools. The water systems were encouraged to develop and record asset data with the goal of using this information with an asset management system in the future. Targeted assistance was provided to three of the MPUC regulated utilities. The targeted assistance included:

- A kick-off and wrap-up meeting with the system staff and board
- Free GPS/GIS work, if necessary (work may include, but not be limited to, asset location and relevant tax parcel digitization)
- Development of a list of critical physical infrastructure assets
- Assistance in developing a list of critical physical infrastructure asset attributes, including at least a conditions assessment, current valuation, estimated useful life, replacement cost, and depreciation



- Assistance in developing a computer-based database using asset management software for long-term tracking and management of critical infrastructure assets

By focusing on a group of closely aligned utilities (geographically and functionally), we hoped to set the groundwork for collaborative asset management effort between the targeted systems.

OUTCOMES

One additional utility from a neighboring county was added to the project, with the approval of the Maine Drinking Water Program. This utility shared many of the same characteristics of the Franklin County group. This brought the total systems invited to participate to 12. The total reach for the broad training program was seven out of 12 systems, or 58 percent, with 10 system staff attending for 72 hours of training per person. Targeted assistance was provided for three systems. All three systems required technical assistance in identifying

View from Tumbledown Mountain—Franklin County, Maine

locations of critical assets and creating criteria to assess important asset attributes such as condition, value, replacement costs, useful life, and depreciation.

All three systems used EPA's CUPSS asset management program, as it provided a no-cost option for tracking assets. MRWA provided technical assistance in installation and 15 hours of software training via Webinar in the use of CUPSS. It also provided each system with a reproducible GIS base map of water system assets, a written asset management plan generated by CUPSS, and a capital improvement plan, generated by CUPSS.

Each system was left with the knowledge and capability to maintain an asset management program.

LESSONS LEARNED AND FUTURE GOALS

All indications are that the training was well received, as seven out of the 12 PUC regulated utilities participated. The most positive comments were from the hands-on nature of the training, in which participants were broken into small groups and walked through the asset evaluation process outlined in CUPSS and the New Mexico Finance Center. Targeted software training was accomplished exclusively through screen-sharing Webinar technology. This allowed the trainee full access to his or her own computer and own data without the trainer standing over him or her. It made the training more meaningful and provided better context for the importance of the data.

While we were successful in getting systems interested in the general training, the individual training offer was not as well received. The most common responses to offers of continued training were suspicion of further regulatory intrusion, the thought that further training was unnecessary, and lack of time. I attribute this to lack of development in building support or a base for the project, either with more preliminary meetings or more broad-based training.

Access to information was challenging for all three systems that participated in the targeted training. Two systems were contract-operated, and while the contract operators were invested in the process, getting financial information from their volunteer boards was difficult. We anticipated this by meeting with the respective boards of directors as part of the targeted assistance, but we still had limited success in extracting the necessary data. The third system's records were so poor that good financial information was difficult to extract under the time constraints of the grant.

The project started with the idea of a collaborative effort using a jointly supported software package to make the process of asset management easier and more streamlined. However, once the three systems chose to use CUPSS, the targeted training evolved into MRWA setting up the CUPSS database and training the systems to use that software. Thus, the collaborative effort was lost. Despite this, perhaps the greatest victory of this program was enhancing the support network of the utilities involved. For example, despite their geographic proximity and participation in other MRWA trainings, two of the operators who participated had never met prior to this project.

This project also uncovered a knowledge gap between water system operators and record keepers in these small utilities. Operators had a great understanding of their physical system but lacked the knowledge to adequately track expenditures of materials, labor, and equipment. Similarly, the record keepers tracked information in a manner necessary for their accountants to create end-of-the-year reports for the MPUC; however, they were not optimal for tracking total cost of ownership and asset management. Asset management involves administrative, operations, and governing portions of utilities. Moving forward, MRWA hopes to create new training materials and programs to bridge this gap. We thank the Maine Drinking Water Program for the opportunity to pilot this program in Franklin County and look forward to continuing the project.

Questions regarding this project may be addressed to Alex Wong, project manager, Maine Rural Water Association, 254 Alexander Reed Road, Richmond, ME 04103. Links to Alex's email may be found at mainerwa.org.

ABOUT THE AUTHOR

Mr. Wong has a bachelor's degree in environmental science and master's degree from the University of New Hampshire, where he studied Limnology. He has worked for the Maine Rural Water Association for the past 10 years, providing assistance to water and wastewater systems on a range of topics including technical training, source protection and physical asset management.

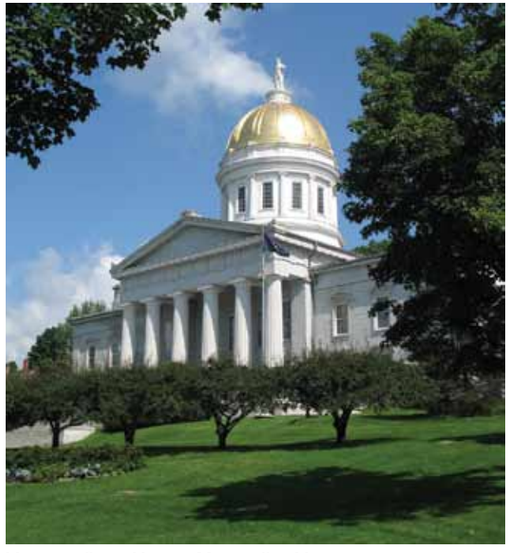
FEATURE

The domino effect—incentivizing planning to drive demand for water utility projects

ERIC J. LAW, Vermont Department of Environmental Conservation, Montpelier, VT
ASHLEY LUCHT, Vermont Department of Environmental Conservation, Montpelier, VT

ABSTRACT | As is the case for the rest of the country, the capital-improvement needs of Vermont drinking water utilities are expected to remain high due to aging infrastructure and increasingly strict environmental and public health requirements. To assist water utilities in meeting this challenge and to secure ready-to-proceed projects for state revolving funds (SRF), Vermont's drinking water state revolving fund (DWSRF) incentivizes the development of capital-improvement projects through a separate revolving fund specifically for planning. This planning loan fund includes incentives such as delayed repayment, favorable loan terms, and under some conditions, forgiveness. By incentivizing planning, we eliminate a large hurdle for water utilities hesitant to initiate planning or incur debt for consultant services, resulting in ready-to-proceed projects. However, additional planning initiatives, incentives, and outreach may be necessary to shift water utilities from being reactive to proactive amid an increasingly wider funding gap.

KEYWORDS | Water, infrastructure, financing, gap planning



Vermont State House, Montpelier, Vt.

INTRODUCTION

Before the federally capitalized planning loan revolving fund in Vermont, there was a state-funded planning advance program. Since circa 1970 Vermont offered planning advances to municipalities, until the DWSRF program was created in 1997. At that time the state began issuing planning loans under a second revolving fund (the first was the construction revolving loan fund, which provided low-cost financing for water infrastructure construction). The start-up money for the planning revolving loan fund was carved out of the local assistance set-aside, starting with the Environmental Protection Agency's (EPA's) capitalization grant in 1998.

Although the state planning advance program still exists, funds are extremely limited and reserved for feasibility studies for communities lacking municipal drinking water infrastructure. Most municipal and eligible private entities use the planning loan revolving fund to finance the design of public water infrastructure improvements. Whether through planning advances or planning loans, Vermont has long held the belief that water utilities need a jump start to get necessary projects off the ground. With even more capital projects on the horizon and potentially less government *construction* financing, we are likely to embrace this belief even more.

A SHORT HISTORY

The replacement of state grants with a revolving loan fund was met with public reluctance because of the assumption that financing for municipal projects would be less favorable. Alternatively, the hope of many drinking-water professionals was that someday there would be an infrastructure bank to fund not only projects with the highest public health risks but, if the fund grew large enough, also general water-infrastructure replacement projects, such as waterlines. Although considered the best funding mechanism at the time (especially for surface water treatment projects in the early 1990s), Vermont's construction grants were more limited than revolving funds in both eligibility and amounts (e.g., most waterline replacement was not considered an eligible cost). Public support for grant levels needed to meet Vermont's water infrastructure demand could not, and would not, materialize so a national shift to a revolving fund, or infrastructure bank, was quickly accepted as the best way forward in Vermont.

Vermont water utilities soon learned that with revolving loan funds there would be more money available for more types of water-infrastructure projects. With the advent of disadvantaged status for communities with median household incomes below the state-wide average, even the 35-percent grant, 65-percent local share breakdown for a construction grant under the state grant program—which many water utilities thought could never be beat—was improved on with the revolving loan fund. Our most income-sensitive communities receive loans at -3-percent interest over 30 years (which equates to a 40-percent principal subsidy over the life of the loan). It also didn't take long for the Vermont DWSRF program and its loan recipients to phase out the word "grant" and instead use "principal subsidy," because in the case of every issued loan there is repayment and a repayment start date, further incentivizing utilities to closely track their projects and accept responsibility for project schedules, costs, and legacies.

Shifting completely from a state grant program to a revolving loan fund was integral to the success of the latter, but the originators of the Vermont DWSRF program realized early on that there was a missing element to the new construction funding mechanism; meanwhile, there was an element of state grant funding that they knew worked and wanted to keep—*a means of helping a water utility initiate a project and position itself to actually receive construction funding*. The availability of incentivized construction money could certainly start the conversation, but if there was no preliminary engineering report to detail exactly what was needed and for what cost, water utilities had little incentive outside regulatory compliance deadlines to initiate a project. Sure, a project could be in the fundable range on any given year's SRF construction priority list, but feasibility work, source exploration, preliminary engineering and final design could cost tens of thousands that they didn't have in reserves. Interest accruing rapidly on debt for a project that didn't have a set start date could prove to be too much for board members wary of the financial unknowns and of selling the project to an equally wary public.

To facilitate projects and complement environmental regulatory work, the authors of Vermont's DWSRF program decided to provide some predictability in the early planning stages. They could only do so because the authors of the Federal Interim Rule creating the DWSRF had the foresight in late

VERMONT
DRINKING WATER STATE REVOLVING FUND (DWSRF)
Planning Loan Program

Eligible Organizations

- Municipal entities with a population under 10,000
- Private non-profit community water systems with populations under 10,000

Eligible Projects

A majority of water system improvement projects are eligible (new construction, renovation or replacement, or consolidation of systems), including those that may be found ineligible for construction funding. Eligible planning efforts include:

- Comprehensive and system-wide preliminary engineering evaluations
- Preliminary and final design engineering for specific projects
- Source exploration
- Feasibility studies for a new water utility or renewable energy projects
- Asset Management and User Rate Analysis
- Energy and Water Efficiency Audits

Vermont water infrastructure financing program guidelines

edits to grant flexibility in the use of EPA capitalization grant set-asides for such initiatives as non-construction revolving fund programs (i.e, source protection and planning loan revolving funds), which could fund services explicitly ruled out or, because of timing, not immediately eligible for SRF construction loans.

PREDICTABILITY AND MONETARY INCENTIVES

Predictability came in the form of offering a planning loan to almost all water system projects, including those that may be found ineligible for construction funding. Eligible planning can include comprehensive and system-wide preliminary engineering evaluations, preliminary and final design for specific projects, source exploration, feasibility studies for a new water utility or renewable energy projects, asset management and user rate

analysis, or energy and water-efficiency audits. Applications are accepted continuously throughout the year and a bond vote is not necessary, allowing water utilities to engage in planning on their time table.

For example, a water utility may have a targeted water pressure issue that requires immediate planning in hopes of having solid cost estimates for voter approval three months later and a construction start six months later. With the planning revolving loan fund, the water utility could send in an application

There is a funding gap to replace water infrastructure, possibly the most important infrastructure we have, and there is no time to postpone planning.

along with a draft consultant agreement and after SRF review of the project scope, services, and cost be recommended for loan approval a few weeks later—no pre-qualifications, no need to wait for a bond vote, and no need for a priority-list ranking (unless, of course, there is not a surplus of funds).

On the other hand, a water utility may want to identify all critical assets, evaluate their condition, and recommend a 20-year capital-improvement plan. The holistic approach to planning is often the ideal and most cost-efficient way to move forward and one the Vermont DWSRF program strongly encourages. This approach, however, takes additional time to complete, review, and sell to the voters (i.e., there are more resulting construction projects to fund). To accommodate all projects—from narrow to comprehensive scopes—the Vermont DWSRF program delays the first repayment until two to five years after the last loan disbursement or approval of the preliminary engineering report, whichever occurs first, to allow for project development. This feature more than probably any other eliminates some apprehension of utility decision-makers who do not want to incur interest during planning or feel rushed to act on report recommendations.

If the project does not come to fruition, the planning loan is paid back over five years at zero percent. If a project does materialize, the *non-forgivable* portion of the planning loan is rolled into a construction loan at the term and interest identified for the construction loan. To incentivize planning for smaller systems, which have less economy-of-scale and are likely operating without full-time paid staff, the Vermont DWSRF program offers up to $25,000 planning-loan forgiveness if certain conditions are met. The program also offers up to $50,000 forgiveness for systems that use non-DWSRF money for construction or have a user rate following project completion of more than 2 percent of the community's median household income.

Conditioned loan forgiveness allows the Vermont DWSRF program to accomplish two important things. On the front end, just by communicating who is eligible and who is not, the program confirms its readiness to assist smaller or economically disadvantaged systems to initiate necessary water-infrastructure projects while rewarding water utilities who budget and save for these projects (a nod towards full-cost pricing). The original intent behind forgiving planning loans for projects that used non-DWSRF money for construction was to encourage the use of U.S. Department of Agriculture-Rural Development (USDA-RD) grants and loans, but this provision has more recently been used to reward water utilities who have factored in water-infrastructure improvements in their user rates and self-funded construction.

On the back end, the Vermont DWSRF program uses rewards instead of punishment to make sure, first and foremost, that all improvements for which the planning loan was provided are compete or are on a schedule to be completed. Additionally, the program ensures that there are no outstanding significant compliance issues following the project, the water utility is current on regulatory fees and has closed out all applicable permits, and a SRF capacity development specialist can sit down with water-utility decision-makers, finance managers, and operation managers to discuss the utility needs. Conditioning loan forgiveness is another step in the process but worth it if you consider the deficiencies resolved, as-built drawings stamped and submitted, and important conversations initiated (e.g., asset management, user-rate analysis, full-cost pricing, funding strategies, etc.) as a result of the forgiveness process.

TRACK RECORD

The irony of Vermont's construction revolving loan fund is that only a fraction of the projects on any given year's construction priority list (with each capitalization grant comes a priority list to rank projects based on public health and other factors such as affordability and population) are far enough along in planning to receive financing. Fundable projects, for example, which have not already gone through preliminary engineering and received regulatory approval are not immediately eligible for financing. Initially, non-fundable projects are also denied financing for preliminary engineering as well as final design until projects higher up the list are bypassed and the project is sent a funds availability letter. Other worthwhile projects ineligible for the construction

revolving loan fund or seeking other types of financing join the ranks of projects that need early financing for design and, ultimately, a jump-start. With these pre-qualifications in place for the construction revolving loan fund and similar ones for USDA-RD, there is little built-in capacity in government construction financing to initiate projects and build momentum. And this, in part, explains a steady stream of loan applicants to the planning revolving loan fund.

So whether it is having very little in cash reserves to self-fund planning efforts, not meeting the pre-qualifications or being not yet fundable (and, perhaps, ineligible) for the construction revolving loan fund (the timing piece as explained above), or just wanting to take advantage of additional time to verify report findings and/or potential forgiveness, water utilities requested 227 loans and loan amendments from 2006 through 2012 from the planning revolving loan fund. Demonstrating the growing popularity of the program, 94 loans and loan amendments were made in the first nine years of the program (1998-2006), averaging just more than 10 a year; in the last six years, the planning revolving loan fund averaged 38 loan actions (totaling $833,000) per calendar year, a nearly 300-percent increase.

Just considering the number of planning loans may not tell the whole story, but what may is looking at what percentage of our drinking water construction loans followed a planning loan. This feeder program is especially important now that there is a national focus on un-liquidated loan obligations (ULOs; money awarded to states but not yet spent) and the Council of Infrastructure Financing Authority's (CIFA's) emphasis on demand-side management to curb ULOs. Two of CIFA's recommendations—creating a back-up list of projects and incentivizing readiness-to-proceed for all priority-list projects, initially fundable or not—could be greatly enhanced with a planning revolving fund.

It turns out more than 60 percent of drinking-water construction loans issued from 2002 to 2011 resulted from a planning loan. If we look at loans issued under the American Recovery and Reinvestment Act (i.e., Stimulus) where there was a big infusion of money and an intense emphasis on readiness-to-proceed, we discover more than 50 percent of Stimulus loans trace back to a planning loan. Even more instructive may be that nearly 90 percent of fundable projects on our two most recent construction priority lists stem from planning loans. Do we draw a correlation between the planning revolving loan fund gaining in popularity (increasing 300 percent in the last six full years compared to the first nine years) and the percentage of construction loans related to planning loans steadily increasing over the last 12 years (spiking to 90 percent in the last two priority lists)? And does this instruct us to increase the visibility and adjust incentives under the planning revolving loan fund to increase demand for construction loans?

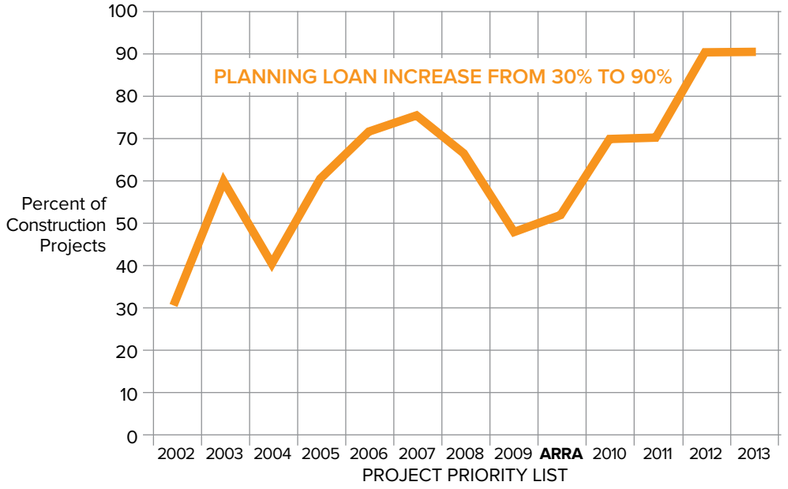


Figure 1. Percent of construction projects stemming from a planning loan (actual & projected)

A NATIONAL ISSUE, BUT NOT A LOCAL ISSUE?

It is enticing to declare a working hypothesis—an increase in planning loans will result in more ready-to-proceed construction projects—based on the raw data we have analyzed and propose further research. However, given limited time and resources, the Vermont DWSRF program is intent on better understanding the extent of the problem our planning and construction loans seek to address. As important as it is for a funding agency to know what drives demand for water-utility projects, an even more fundamental and instructive question is why we want to initiate this planning in the first place.

The "why" is not elusive: Pick up a major newspaper or magazine and note the journalistic references to the work of EPA, the American Water Works Association, and the American Council of Engineers, all pointing to a *funding gap* for the replacement of water infrastructure. The methodologies and assumptions behind their analyses may vary,

but regardless of their mathematical equation the sum of the parts is negative, deeply negative. There is a funding gap to replace water infrastructure, possibly the most important infrastructure we have, and there is no time to postpone planning.

The problem is that until water-infrastructure improvements make it into the preliminary engineering report for a water utility, there is and will remain a disconnect between the *projected* needs mentioned in EPA's drinking water infrastructure gap analysis and needs assessments and the specific and more *demonstrative* needs of many Vermont water utilities. Regulatory and compliance work related to the federal Safe Drinking Water Act and Vermont's Water Supply Rule have provided plenty of impetus for water-infrastructure projects, but there are limitations to regulation especially when it comes to the sleeping giant—aging infrastructure. State and federal regulation does not routinely legislate proactive replacement of aging infrastructure. *Until there is a problem, there is no problem.* Unless, of course, utility decision-makers can forecast the problem before it happens and plan for it.

THE POWER OF PLANNING

Water infrastructure may deteriorate so rapidly in this country it may be necessary to regulate planning and sustainable financing, but this is probably years away. Despite a template half way around the world in Australia, regulators and the regulated in this country find it unappealing (at least initially) to regulate our way out of the aging infrastructure and funding-gap problem. But what if we appeal to the Yankee spirit of common sense (e.g., proper maintenance saves money) and incentivize comprehensive planning.

Aging infrastructure, and how to pay for it, are major problems, yet many water utilities either don't know there is a problem or don't want to admit the problem. It shouldn't seem so foreign an idea because our homes are really no different. How many of us seek a third-party inspection with a construction professional to assess the state of our home and estimate an amount for repairs? How many of us attempt to complete a capital-improvement plan for what is likely our single biggest life investment? I choose an analogy in which everybody can relate to make the point that very few of us do this analysis even though we know it is important.

The fifth and final domino is educating the public about project need and securing financing

But, again, what if there were an incentive for water utilities to complete comprehensive planning to establish a 20-year capital-improvement plan? This would take the form of a comprehensive preliminary engineering report that locates critical assets, assesses their condition, and establishes a recommended list of projects and estimated costs. Many engineering deliverables sit on a dusty shelf, but what if this one had a concise and well-written narrative and the findings were presented before a conscientious board of decision-makers? And what if this third-party, unbiased report was the basis of a bond vote for capital improvements, taking some of the wind out of citizen complaints that politics are at play or there is no basis for the project. If it sounds too good to be true, the Vermont DWSRF program assures you it is not because this is the "domino effect" we often see here (and want to see even more of) in Vermont.

Before a chain reaction can occur, water-utility decision-makers need to recognize or be informed that aging infrastructure is an emerging and costly problem and, compounding the problem, state and federal funding assistance will not meet the projected need (i.e., the funding gap). The dominoes are set when there is predictability of getting a planning loan and incentives are clearly communicated to a water utility to encourage the solicitation of engineering, hydrogeological, or other consultant services. The first domino is toppled when the board signs the engineering agreement and debt is incurred. Unlike planning advances, planning loans necessitate an actual decision to move forward with a project or not, and this is one reason why a greater percentage of planning loans come to fruition (and much earlier) than planning advances.

The second domino is toppled when public-works staff, operators, and engineers present a convincing case that water-infrastructure improvements are necessary to protect public health. The third domino is toppled when the board reads the report, decides action is necessary, and commits to at least the final design of the highest-priority capital-improvement project. The fourth domino goes down as a result of project planning being financed with public monies and, as a result, vetted by the regulating environmental authority every step of the process—including consultant contract review, approval of the preliminary engineering report, environmental review, and issuance of the permit-to-construct. The fifth and final domino is educating the public about project need and securing financing, usually through a bond vote, that results in a sustainable user rate. While felling all the dominoes may take time, shy of any surprises, it is rare they are left standing.

A PARADIGM SHIFT

Once water utilities see on paper what they have to replace, how do DWSRF programs help water utilities meet the steeper challenge at hand: more capital-improvement projects and less available state and federal construction funding. As DWSRF programs start to revolve more aggressively (SRF loan payments plus interest), since the 2010 edition they have faced declining capitalization grants. Many would argue that was the design and intent of the program from the beginning, but this does little to calm the fears of water utilities.

In Vermont, we saw a slight bump in revolving loan money in 2012 (due to a lump payment for one of our largest loans) that more than made up for the lower capitalization grant amounts in the preceding years, but if the trend continues, revolving money will not be sufficient to offset lower annual capitalization grants. Under this trending scenario, the funding gap grows wider. However, in states with high ULOs (defined loosely by EPA as more than 15 percent of the total federal grant amount), the funding gap is but a strong theory that will most likely prove correct. We can take it into account and plan for it, but first we must resolve the ULO issue, and using planning loans may help address this.

It appears that with an increase in planning loans there is a corresponding increase in the percentage of construction loans tied to a planning loan. If we recognize this trend, we should market and increase incentives to solicit more planning loans, which in turn would result in more construction loans, essentially resolving our ULO issue. Some of the efforts being talked about in Vermont are simply marketing more aggressively the advantages of the planning revolving loan fund already in place. Other ideas include investment in leak detection, hydraulic analysis, and asset-management initiatives, which could serve as feeder programs to the planning loan revolving fund. More robust regulatory and compliance actions coupled with slight changes to planning-loan incentives to align more accurately with desired outcomes may finally put to rest the lack of readiness-to-proceed on our construction priority lists.

When we reduce ULOs to a sustainable level (in Vermont we need to lower our ULOs by at least 5 percent and work off a maximum of two priority lists at any one time), the discussion can shift to the future of planning given the anticipated funding gap. Given less government funding available, the tough question may be, do we plant more "seeds" (i.e., issue more planning loans and provide more incentives) to help water systems adapt to a new funding reality where SRF Programs fund less and less of a growing list of projects? If the funding-gap analyses prove correct, there is no way we can fully fund the "crop."

Are we doing water utilities a service or a disservice by letting them think there will be ample and subsidized government construction funding into the foreseeable future? Are we a more responsible funding partner to channel a greater percentage of our monies towards helping water utilities become more proactive, from a planning and financial sustainability standpoint? While we ponder these interesting questions, in Vermont we plan to continue with and improve upon the planning loan revolving fund, as potential remedies to an emerging ULO issue and the water-infrastructure funding gap.

REFERENCES

- US Environmental Protection Agency (2002) The Clean Water and Drinking Water Infrastructure Gap Analysis; EPA-816-R-02-020; Wash., D.C.
- US Environmental Protection Agency (2009) Drinking Water Infrastructure Needs Survey and Assessment, 4th Report to Congress; EPA-816-R-09-001; Wash., D.C.
- Bernstein, H, Laquidara-Carr, D., Fortin, J., & Haskins, S. (2013) "Water Infrastructure Asset Management: Adopting Best Practices to Enable Better Investment." Smart Market Report. pg. 50

ABOUT THE AUTHORS

- Eric Law, Vermont's DWSRF program specialist, has a bachelor's degree in business and a master's degree in education to teach English and French. During his time in Montana as a forest firefighter and ski instructor, he began to teach within the context of environmental issues rather than the world of literature. He was in the city of Boston as a bike messenger nearly 10 years ago when the Vermont Department of Environmental Conservation asked him to work in environmental regulation and now environmental finance.
- Ashley Lucht has worn many hats over the years, including having served in the capacity development position where she spent countless evening hours meeting with local governing boards helping them to navigate funding programs, establish equitable and sustainable user rates, and open their eyes to the amount of non-revenue water in their systems. She is a graduate of the Vermont Public Manager Program and chair of Vermont's Drinking Water Week committee.

Managing growth in nitrogen-sensitive watersheds can help reduce Cape Cod wastewater infrastructure costs

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ABSTRACT | Many coastal areas in the U.S. have addressed wastewater-related water-quality problems by constructing extensive sewer systems and centralized treatment facilities. Complete sewering of near-shore areas has been the norm. A clear exception is Cape Cod, the spit of glacial outwash extending into the Atlantic Ocean from southeastern Massachusetts. There, very permeable soils have allowed intensive development that relies mostly on on-site septic systems. Septic-tank-and-leaching-field systems have addressed the sanitary needs of wastewater disposal, but their inability to remove significant amounts of nitrogen has led to extensive nutrient enrichment of coastal waters. Non-traditional means of nitrogen control (such as fertilizer reduction and use of natural attenuation) are being employed to combat this problem, but it is widely thought that extensive sewering will be needed to remove septic nitrogen from the watersheds of sensitive embayments.

Most of the controllable nutrient load reaching Cape Cod's coastal waters comes from residential or commercial development. Local communities planning sewers are sizing wastewater infrastructure to address nutrient load from existing development as well as a projected amount of future growth. Added nutrient load from projected future growth is a major contributor to overall system cost. This paper explores why growth is so important to the long-term costs for infrastructure and how strategies to manage future growth can help to mitigate these costs.

KEYWORDS | Water, infrastructure, financing, gap planning

LAND USE AND EXISTING INFRASTRUCTURE

The need to protect coastal waters from excessive nutrient loads affects nearly all of Cape Cod. Figure 1 depicts all the principal coastal watersheds on Cape Cod; the shaded areas are tributary to coastal waters that are nitrogen sensitive. Nearly 70 percent of Cape Cod land—and most development—falls within this category. Residential homes account for 96 percent of the 134,000 developed parcels on Cape Cod, and nearly three-quarters of these homes are within a nitrogen-sensitive watershed. Existing development supports a year-round population of 215,000 that swells to nearly one million during the summer.

Scarcely any nitrogen load coming from developed parcels in nitrogen-sensitive watersheds is serviced by sewers. Figure 1 also shows the locations of the five existing publicly owned wastewater treatment facilities and the very limited area they serve. Private developers have installed about 50 satellite treatment facilities to serve condominium developments, shopping centers, and nursing homes. Between the public and private facilities, only about 14 percent of the Cape's wastewater is treated to remove nitrogen, and one-quarter of that capacity is in the private facilities. This lack of infrastructure has left Cape Cod scrambling to manage excessive nutrient loading of coastal embayments caused by decades of untreated wastewater discharges to the groundwater.

PROJECTED COSTS FOR NEW INFRASTRUCTURE

Restoring the health of Cape Cod's nitrogen-sensitive coastal embayments will require extensive sewering. Studies by the Cape Cod Commission have shown that as much as 55 percent of the current development must be served by advanced wastewater treatment facilities to deal with nitrogen overloading, even in the absence of added growth. If future development increases wastewater flows by 30 percent, treatment facilities must be large enough to serve 65 percent of the Cape, and 90,000 to 100,000 properties could require sewer service.

The Cape Cod Commission has estimated infrastructure costs associated with nitrogen control (see Figure 2). In the absence of growth, an investment of approximately $3.4 billion may be needed to treat wastewater from existing development. As large as that figure is, another $1 billion to $2 billion could be needed to address future nitrogen loads associated with new construction on vacant lots and redevelopment of under-used land.

The Commission has identified several factors that most strongly "drive" these costs. Those factors include the density of development in areas to be sewered, the growth rate in nitrogen-sensitive watersheds, and the ability to locate effluent disposal sites in non-sensitive areas. Among these factors, growth is the one that communities can most readily control to mitigate long-term infrastructure costs.

HOW DOES GROWTH AFFECT COSTS?

Before exploring the options communities have for managing growth, it is first important to understand why growth so strongly influences infrastructure costs. Growth represents the intensification of land uses that generate nutrient load. In the typical Cape Cod watershed,

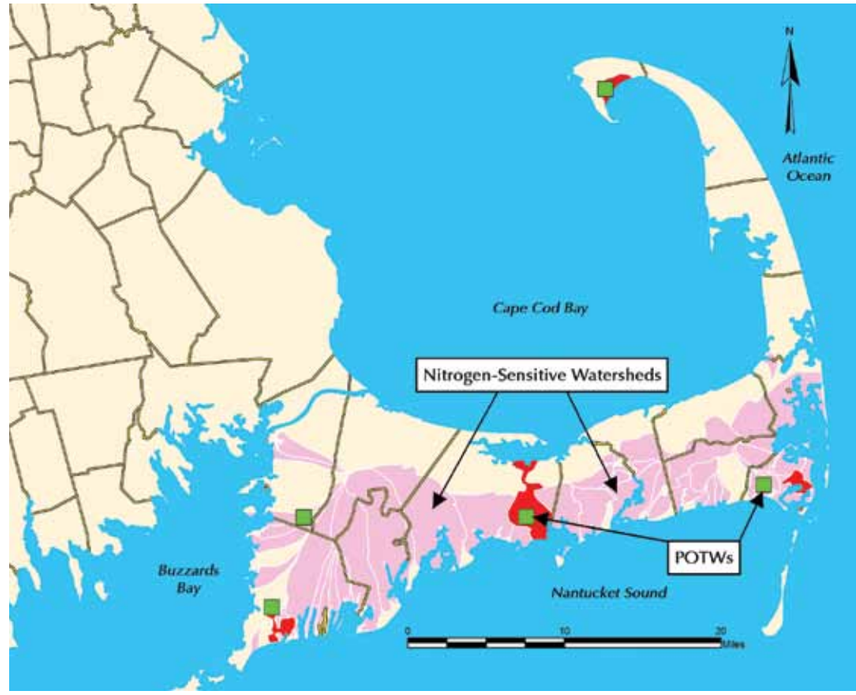

Figure 1. Nitrogen-sensitive watersheds and Cape Cod wastewater infrastructure

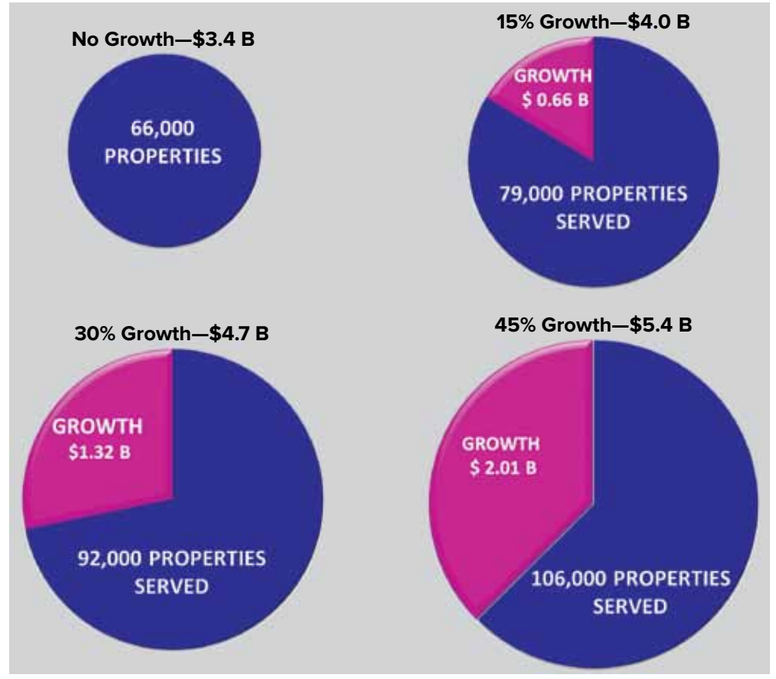

Figure 2. Cape Cod commission estimates of costs for new wastewater infrastructure

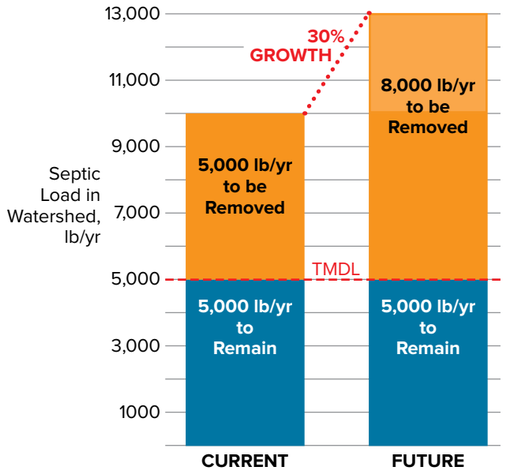

Figure 3. Growth significantly increases nitrogen control needs

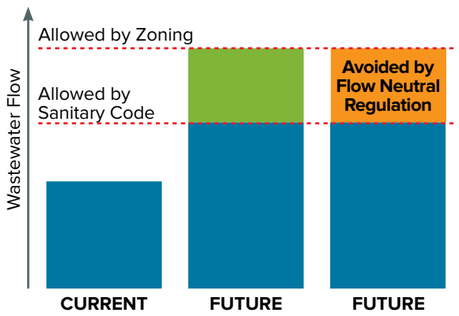

Figure 4. A flow-neutral approach avoids sewer-induced flow

three-quarters or more of the controllable nutrient load comes directly from septic systems, and the remaining quarter comes primarily from fertilizers and road or rooftop run-off. The Massachusetts Estuaries Project has been studying nitrogen-impaired embayments to determine how much nitrogen load from watershed land uses would need to be removed to restore eco-system health. The MEP has found that in most cases one half or more of existing septic systems would need to be eliminated (and typically replaced by sewers) to reduce the nitrogen levels in the embayment to a threshold level that does not cause algal blooms.

However, the average 50-percent reduction needed to bring down water column nitrogen to a threshold level addresses only the *current* load (see Figure 3). If there is additional growth in the watershed, in the form of homes or businesses that would be served by on-site systems, then *all* of that "new" nitrogen would need to be removed from the watershed to keep the total load at the threshold level. Thus, there are two factors in the equation for this hypothetical watershed:

- Reduce by 50 percent the current septic nitrogen load
- voiding 100 percent of the new septic nitrogen load resulting from growth

In watersheds where significant growth is expected, the costs to control "new nitrogen" actually exceed the cost for reducing "current nitrogen." The "new nitrogen" half of this equation can be mitigated with savvy growth-management techniques.

The location of expected growth is also critical. If a town is zoned to allow significant growth in a nitrogen-sensitive watershed, high costs will result for nitrogen control. If that town can shift its growth focus to non-sensitive watersheds, some of the growth-related costs can be avoided. Furthermore, growth that is spread out over a larger area of the watershed will increase collection costs, while growth that is clustered or concentrated in a town center can be collected more cost-effectively.

CONCEPT OF FLOW-NEUTRAL PLANNING

The amount and location of future growth has a significant impact on sewer cost. Further, the availability of sewers enables more growth. Towns can influence wastewater infrastructure costs by controlling the amount and location of future growth. This control over growth is accomplished through land-use zoning.

Planning approaches that coordinate the design of wastewater infrastructure with zoning help to ensure that sewering accomplishes the necessary nutrient removal for existing development as well as a desired level of future growth. Under this approach, the sewering capacity or flow allocated to different parcels is determined by a combination of zoning that governs the uses and intensity of development of parcels and sewer regulations that determine the allowed flow that can be contributed to the sewer system. The combination of land-use controls and flow limitations ensures that limited sewer capacity is allocated where growth is desired. Conversely, by working in tandem the regulations ensure that sewers do not enable unwanted growth.

Sewering is thought to enable growth when the full development potential of a parcel under zoning had been restricted by on-site septic treatment regulations. This has indeed been the case on Cape Cod where setback and flow- design limits of the state sanitary code have restricted full build-out of some parcels and, in some instances, rendered parcels unbuildable. In such cases, construction of public sewers removes the setbacks and flow limits in septic regulations, making full development under zoning possible. Figure 4 illustrates this.

Flow-neutral planning seeks to ensure that future sewering will not accommodate an increase in wastewater flow over what could have occurred under the zoning and on-site septic treatment regulations in effect prior to sewering. Flow neutrality is an important policy consideration that has grown out of local and regional concern that installation of sewers would lead to proliferation of unwanted residential and commercial development.

Recognizing this concern, the Massachusetts state revolving fund has made flow neutrality a criterion for obtaining zero-interest loans for construction of wastewater infrastructure projects involving nutrient control. To demonstrate flow neutrality, a town must have adopted land-use controls to ensure that planned wastewater infrastructure will not increase wastewater flow beyond what was authorized under the zoning and wastewater regulations at the time the wastewater infrastructure plan was adopted. That is to say, if towns want sewers to allow more growth, zoning to allow that additional growth must be in effect at the time the sewer plan is adopted. Zero-interest loans for Cape Cod towns, compared with traditional municipal bonding, could be worth hundreds of millions of dollars.

The intent of the flow-neutral requirement is to ensure that installation of sewers does not result in an increase in growth unless the added growth is consistent with duly adopted land-use regulations in effect when the infrastructure plan is put in place.

To meet the flow-neutral requirement, communities need to decide how much growth they want sewers to accommodate. Estimates of future growth used to plan wastewater capacity should be fully vetted by the community to ensure that resulting growth patterns are desired. In practice, a town developing a wastewater plan may estimate future growth using assumptions that have not been fully vetted by the community, or are based on zoning that is decades old and may be inconsistent with contemporary community planning objectives. The result may be a sewer plan that reinforces undesirable or outmoded growth patterns, or that masks the cost of wastewater treatment necessitated by that growth. Once a desired level of growth is identified, the community should consider how much it would cost to build a sewer system to accommodate that level of future growth. This ensures that a community understands and accepts the cost of providing a level of wastewater treatment needed to support future growth. The selection of growth level and assessment of costs may be an iterative process to determine the balance of growth and costs acceptable to the community.

The Cape Cod Commission provides a framework for this iterative approach in its "Guidance for Local Wastewater Management Plans" (December 2012). The guidance instructs towns in the earliest stages of planning to estimate the cost of wastewater treatment for mitigating wastewater flows based on current zoning and to estimate the cost of wastewater treatment for alternative scenarios of future growth. Providing the public with this information early enables the community to understand and indicate a desired growth potential with an acceptable cost. The guidance further recommends that later stages of wastewater planning should not begin until the town has achieved consensus on future growth and associated costs for providing wastewater treatment for that growth. Given the cost implications of growth in nitrogen-sensitive watersheds, this early identification of costs is critical to development of a publicly acceptable plan.

The key aspects of managing growth and wastewater costs are best understood in terms of a broad range of fundamental options open to a town. Table 1 contrasts these options for determining limits of growth and associated wastewater flows that will have implications for wastewater treatment costs. The options are:

- No-growth
- Flow-neutral
- Status quo
- Growth-promoting
- Net-flow-neutral

The options in Table 1 allow a town to assess the relationship between growth and wastewater costs. The options demonstrate that the best ways for towns to limit wastewater costs are to reduce future wastewater flows by limiting growth to what could occur without sewers

Table 1. Options for managing growth and wastewater flows

Option	Growth and flow effects	Cost implications
No-Growth	Zoning is amended to prohibit new development or expansion of homes and businesses to avoid any increase in nitrogen load.	Costs are reduced because future nitrogen loads are avoided.
Flow-Neutral	Sewer regulations are put in place to limit flow to only what would have been allowed under the state sanitary code. Full development of parcels under zoning yet limited by the state sanitary code still is not allowed to occur.	Costs are controlled by limiting nitrogen loads to those that would be allowed by zoning but not by the state sanitary code.
Status Quo	Zoning is unchanged but the absence of state sanitary code limits means that sewering allows incremental growth in instances where the state sanitary code had prevented the full potential of growth allowed by zoning.	Growth enabled by sewering results in higher costs than under the flow-neutral scenario.
Growth-Promoting	Zoning is amended to allow increased growth, which in turn increases nitrogen load.	Costs increase due to wastewater flows associated with added costs.
Net-Flow-Neutral	Zoning allows more growth in some areas and less in others to result in a flow-neutral level of growth and nitrogen load; often referred to as smart growth.	Costs are the same as flow- neutral or are reduced due to improved efficiency of treatment.

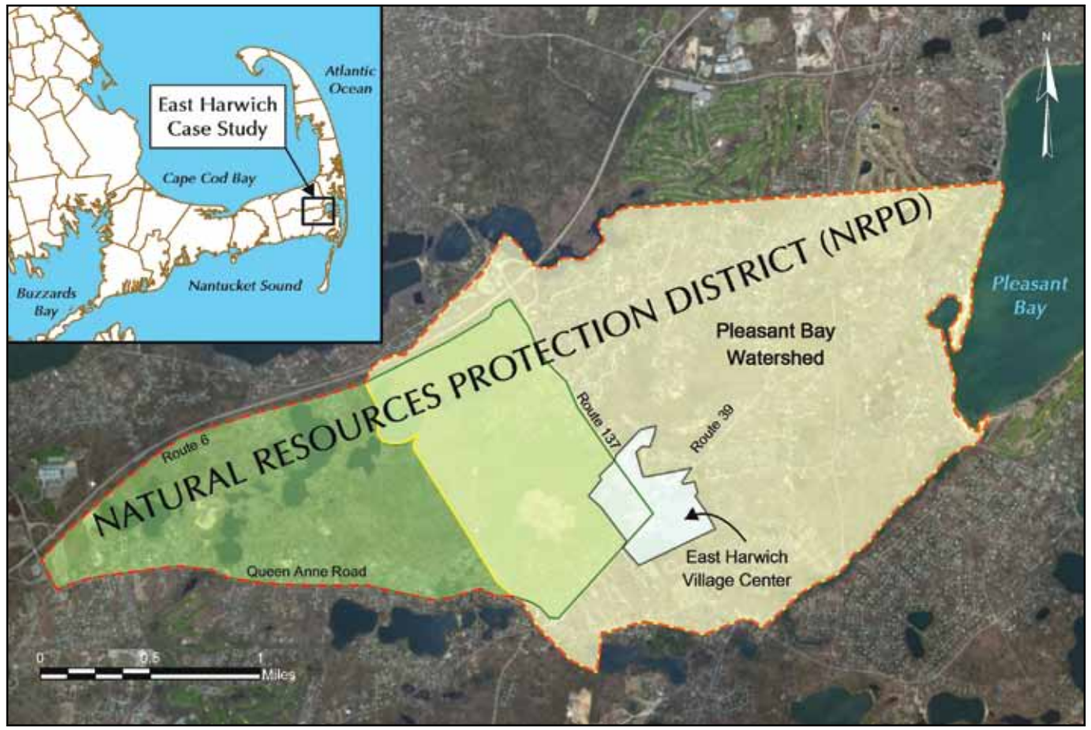

Figure 5. Location of East Harwich Village Center within Pleasant Bay Watershed

(flow-neutral) or by ensuring that more growth in one area is offset by less growth in another area (net-flow-neutral).

SEWERS & SMART GROWTH

Some Cape Cod communities view sewering as an opportunity to reintroduce village-style development that involves a high-density mix of housing and businesses not easily accommodated under the state sanitary code. New zoning to create village centers would be growth-promoting and therefore would increase wastewater flows and infrastructure costs. Using the net-flow-neutral approach the community could create the same village center with increased density and wastewater flows, and balance those increases with a reduction in density and wastewater flow in another area where growth is not desired. This net-flow-neutral approach, also known as smart growth, allows communities to rely on sewers to achieve economic development goals without increasing wastewater costs or impairing sensitive resources.

To help Cape Cod towns understand the effects of sewers on community growth patterns, the Barnstable County Water Resource Collaborative commissioned a report, "Sewers and Smart Growth." The report provides a reference guide for towns seeking to achieve flow-neutral or net-flow-neutral (smart growth) planning and explores the planning challenges and opportunities that emerge with the introduction of sewers.

The planning challenges and opportunities are explored in four scenarios to demonstrate how the introduction of sewers can alter growth patterns:

1. Existing dense residential neighborhoods where the introduction of sewers would eliminate state sanitary code setback and design flow criteria which previously limited full parcel development.
2. Town or village centers where the introduction of sewers could support a desired mix of commercial and residential uses or, alternatively, enable unwanted expansion of land uses.
3. Under-developed areas susceptible to growth that may have sensitive natural resources that could be threatened by additional growth enabled by sewers.
4. Nitrogen-sensitive watersheds in which only a portion of the watershed is sewered, with the remaining area using on-site septic treatment.

Each scenario poses different growth management challenges and opportunities. The report provides case studies to demonstrate the policy tools and regulations available to ensure that wastewater infrastructure reinforces community character, economic development goals, and resource protection.

Presented below is a case study demonstrating how a net-flow-neutral approach combining smart-growth zoning with wastewater planning could accomplish community development goals and reduce overall sewer costs.

EAST HARWICH CASE STUDY

The East Harwich commercial district is within the nitrogen-sensitive Pleasant Bay watershed (see Figure 5). The district is typical of sprawling commercial districts across Cape Cod featuring single-story buildings surrounded by large parking lots. This development pattern is unfriendly to pedestrians, lacks housing, and undermines community character. Under current zoning, substantial new development and redevelopment is possible in the district following this same pattern.

Surrounding the commercial district, several hundred acres of undeveloped land could yield as many as 350 additional houses under current residential zoning. The commercial district and the surrounding undeveloped residential land contain sensitive natural resources, including the Pleasant Bay watershed, unprotected portions of the town's drinking water supply, and several vulnerable freshwater ponds.

The East Harwich planning challenge is two-fold. The first challenge is to guide future development and redevelopment within the commercial district in a mixed-use village development pattern. The second challenge is to preserve as much open space as possible in the surrounding sensitive resource areas and ensure that future nitrogen loads in the Pleasant Bay watershed do not slow progress toward achieving nitrogen thresholds.

Two very different approaches to meeting the planning challenges for East Harwich have emerged from community discussions. A third option, leaving zoning unchanged, also is under consideration. Table 2 lists the three alternatives, and Figure 6 illustrates their impacts on wastewater flows.

- Under Alternative 1, *status quo*, zoning is unchanged, and sewers would allow the same level of development and wastewater flows as current zoning.
- Under Alternative 2, a *growth-promoting* approach, zoning is amended to allow for substantial increases in commercial development and 315 new residential units in the commercial district. Development potential in the remainder of the watershed remains unchanged, so that 350 new housing units still could be developed.
- Under Alternative 3, a *net–flow-neutral approach*, increased mixed-use development potential within the commercial district is balanced with a reduction in the number of homes that could be built on surrounding residentially zoned land. Within the current commercial district, this alternative would increase commercial development, though not to the same level as Alternative 2, and add residential units. To balance this, the proposal also creates a Natural Resource Protection District (NRPD) to encompass surrounding undeveloped residential land within the Pleasant Bay watershed. The NRPD reduces the number of dwelling units that could be built in the outlying area and also increases open space protected from development.

Table 2. Comparison of potential growth in development and wastewater flows under alternative planning scenarios

Alternatives	1 Current Zoning	2 Growth-Promoting	3 Net-Flow-Neutral
Within Village District (EHVC)			
Commercial (sf)	497,000	1,351,000	673,000
Dwelling Units	0	664	315
Wastewater Flow (gpd)	43,000	189,000	93,000
Outside Village District (NRPD)			
Commercial (sf)	35,000	35,000	35,000
Dwelling Units	2,466	2,466	2,146
Wastewater Flow (gpd)	331,000	331,000	288,000
Areas Combined (Totals)			
Commercial (sf)	532,000	1,386,000	708,000
Dwelling Units	2,466	3,130	2,461
Wastewater Flow (gpd)	374,000	520,000	381,000

The growth-promoting alternative would increase wastewater flows by 40 percent over the status quo. As a result, collection, treatment, and disposal of added wastewater flow from the growth-promoting approach would cost $10 million more than the status quo alternative. On the other hand, the net-flow-neutral approach results in a mere 2-percent increase in wastewater flows compared to the status quo. By concentrating new growth in the village center and reducing the number of dwellings that would need to be sewered in the outlying NRPD, the cost of providing wastewater infrastructure to serve the net-flow-neutral approach would be $5 million to $10 million less than the status quo.

The case study demonstrates how increased growth and wastewater flow in a village center, coupled with reduced growth and wastewater flow in resource-sensitive areas, can achieve economic development and resource protection goals while reducing overall wastewater infrastructure costs. The

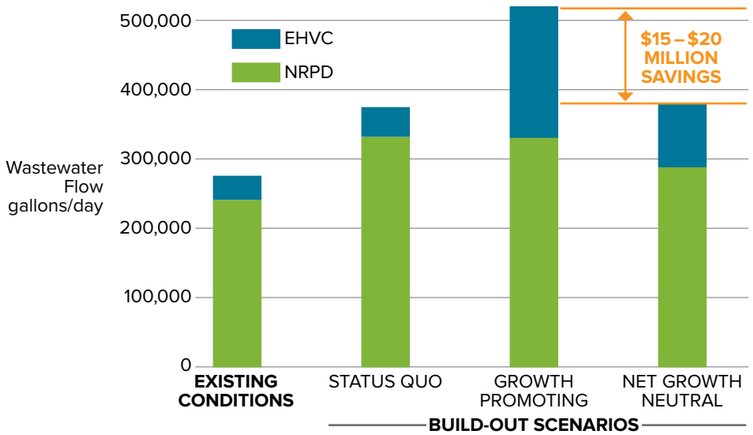

Figure 6. Wastewater flow projections for East Harwich build-out scenarios

alternative of simply increasing growth and wastewater flows results in $10 million more in wastewater infrastructure costs, in addition to the opportunity cost of $5 million to $10 million in lost savings.

Thus, the true difference in cost between the growth-promoting approach and the net-flow-neutral approach is $15 million to $20 million. In addition to costs savings, the net-flow-neutral approach achieves economic and housing goals by allowing for increased commercial development and the same number of housing units compared with the status quo approach.

CONCLUSIONS

Planning for sewers is an opportunity for towns to review community growth projections and ensure that zoning and wastewater infrastructure support the desired amount and location of new growth. Every town should closely project its growth potential as part of both traditional community planning and wastewater management planning.

By coordinating land-use planning and wastewater-infrastructure planning, towns can keep wastewater-infrastructure costs within acceptable limits. In Cape Cod, projected costs for new wastewater infrastructure should be divided: the cost to deal with nitrogen load from existing development and the cost to deal with nitrogen load from future growth. In areas where significant new growth is projected, costs associated with nitrogen from future growth may exceed the cost of dealing with nitrogen from current development. Growth projections used to size wastewater facilities should only be set after planners and the public have discussed the cost of alternative growth scenarios and chosen an acceptable growth-cost scenario.

Changes in zoning may be needed to ensure that wastewater infrastructure reinforces community planning and economic development goals. Where some new growth is desired, towns should seriously consider flow-neutral options to control costs and to show the public that sewering options need not trigger unwanted growth.

As demonstrated by the East Harwich case study, the net-flow-neutral concept should be vigorously pursued. Under this approach, growth is redirected to desired areas such as village centers where sewers are more cost-effective and away from resource-sensitive areas that drive up collection and disposal costs.

In this example, the net-flow-neutral approach reduces overall sewering costs by $5 million to $10 million compared with no change in zoning and generates $15 million to $20 million in savings over the growth-promoting approach. The net-flow-neutral approach accommodates economic development and increased housing production, yet avoids millions in added costs—as well as impacts to sensitive resources—resulting from a growth-promoting approach without a counterbalancing reduction in development and wastewater flow.

REFERENCES

- Barnstable County, 2010, *Comparison of Costs for Wastewater Management Systems Applicable to Cape Cod.* Cape Cod Commission, 2012, Guidance for Local Wastewater Management Plans.
- Ridley & Associates, 2010, *Sewers and Smart Growth: Challenges, Opportunities and Strategies*, report to the Cape Cod Water Protection Collaborative.
- Wright-Pierce, 2012, *East Harwich Village Center: Wastewater Impacts of Build-out Scenarios*, report to Association to Preserve Cape Cod.

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EPA climate-ready water utility initiative

by Curt Spalding, *EPA Region 1 regional administrator*

EPA and the water resources recovery industry face a number of challenges, including aging infrastructure, stormwater management, nutrient pollution in our iconic waters, funding gaps, and rising costs for energy and chemicals. Together, we have been working with our partners in the industry to address these challenges through a management-based approach that includes effective utility management, asset management, and energy-management planning, all under the auspices of our sustainable water infrastructure program.

But as the storms of recent years, including Superstorm Sandy, winter storm Nemo, and Hurricane Irene, have taught us, we now need to prepare for an even greater challenge. That challenge is the increase in frequency and intensity of extreme weather events due to climate change. While we cannot blame any one of these storms on climate change, the pattern of an increasing number and intensity of severe weather events fits the predictions of climate scientists. Water resources recovery facilities across New England have already been affected, including: Warwick, West Warwick, and Cranston, R.I., in the spring of 2010; Greenfield, Mass., and Montpelier, Vt., during Irene; and many coastal facilities during Sandy.

To help the industry prepare for a future with more frequent and severe weather events, EPA has developed the climate ready water utilities initiative. For the water sector, achieving "climate readiness" requires a comprehensive and adaptive approach that incorporates evolving climate science and local conditions, adaptation and mitigation strategies, and engages a broad range of water-sector stakeholders. Like much of our other work, this initiative takes a management-based approach to help water utilities prepare in advance for extreme weather events and also learn from events after they happen. EPA recommends that all water resource recovery facilities begin their planning with vulnerability assessments to see where they may be affected in an extreme weather event.

Extreme event and resiliency planning addresses several disciplines and utility functions. While many utilities have taken steps to improve the preparedness and response to extreme events, a new paradigm of more frequent and intense extreme weather events resulting from our changing climate is forcing a new approach to extreme event planning. This new approach requires utilities to not just plan for a single extreme event in the short term but also for the reoccurrence of multiple extreme events in the short term with consideration of the future. A utility must think beyond just responding and recovery from single events and incorporate measures that ensure sustainability and resiliency of response and recovery activities.


Buzzards Bay area

Several important efforts are underway to support this kind of strategic planning. The climate ready water utilities initiative provides climate assessment tools to help perform vulnerability assessments tailored to the needs of your industry. These include the climate resilience evaluation and assessment tool, a free downloadable software tool that can help operators evaluate the potential impacts of climate change on their facility, a toolbox to support decision-making, an adaptation strategies guide, and a workshop planner for the water sector.

EPA Region 1 is piloting these vulnerability assessments in New England in Buzzards Bay. We recently conducted an extreme-events resiliency planning workshop for communities and utilities in the Buzzards Bay area using the tools in our workshop planner. We are also working with EPA's National Estuary Program and Massachusetts' Office of Coastal Zone Management to perform a climate change vulnerability and adaptation planning study for water-quality infrastructure in New Bedford, Fairhaven, and Acushnet. Outside the Buzzards Bay area, we encourage facilities to take advantage of upcoming and archived webinars available at the climate ready water utilities Web site. These webinars cover various decision-making methods for the water sector, climate science, and different tools and resources.

For utilities that have not yet been affected by the cycle of more frequent and extreme-weather events, an opportunity exists to incorporate climate projects and adaptation measures into the mitigation plans to be more resilient and climate ready. For utilities that have already been affected by an extreme event or are already experiencing this pattern of more frequent and intense extreme events, climate change, sustainability, and resiliency measures need to be incorporated into the response and recovery now.

See next page for information on the EPA's CREAT

More info on EPA's climate ready water utilities initiative and links to its resources and tools can be found at epa.gov/climatereadyutilities.

Since joining the EPA leadership team in February 2010, H. Curtis "Curt" Spalding has been leading a holistic approach to finding environmental solutions in New England. He focused regional efforts on three cross-cutting initiatives: climate change, stormwater and community prosperity.

United States Environmental Protection Agency

Climate Resilience Evaluation and Awareness Tool Version 2.0
A Climate Risk Assessment Tool for Water Utilities

Purpose

The Climate Resilience Evaluation and Awareness Tool (CREAT), developed under EPA's Climate Ready Water Utilities initiative, assists drinking water, wastewater, and stormwater utility owners and operators in assessing risks to utility assets and operations. Extreme weather events, sea-level rise, shifting precipitation patterns, and temperature changes will affect water quality and availability. Managing these events will pose significant challenges to water sector utilities in fulfilling their public health and environmental mission. Version 2.0 of CREAT provides access to the most current scientific understanding of climate change, including downscaled climate model projections, that will increase user awareness of projected changes in climate, related impacts , and potential adaptation options.

CREAT has a flexible and customizable risk assessment framework that organizes available climate data and guides users through a process of identifying threats, vulnerable assets, and adaptation options to help reduce risk. CREAT supports utilities in considering impacts at multiple locations, assessing multiple climate scenarios, and documenting the implications of adaptation on energy use. To support more robust decision-making, CREAT encourages users to compare the performance of adaptation options in multiple time periods across climate scenarios.

FEATURES

Scenarios of climate change are provided at local scales to support identification of threats that affect utilities.

Pre-loaded data contains libraries of drinking water and wastewater utility assets (e.g., treatment plants, reservoirs, pump stations) and customizable adaptation strategies for implementation.

Climate change information and data at regional and local levels is included to support the assessment of threat likelihood and potential asset, environmental, community and economic consequences.

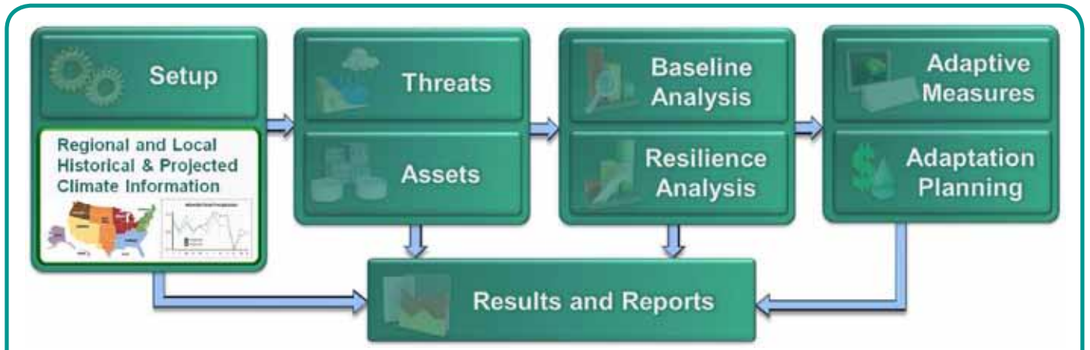
Results support implementation of climate change adaptation options and assessment of their effectiveness in reducing risk to climate change impacts.

Reports on climate data, risk reduction, and costs can be generated from the tool to evaluate various adaptation options.

Data and process can be customized over time as new information becomes available, enabling updates to adaptation strategies in the future.

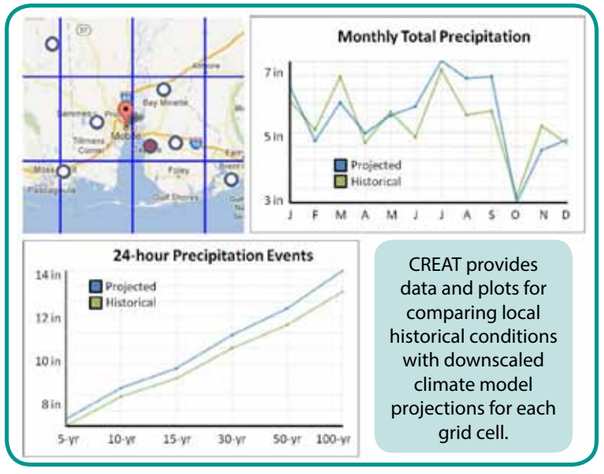
Process: Adaptation, Planning & Use

In CREAT 2.0, water utility owners and operators use information about their utility to identify climate change threats, assess potential consequences, and evaluate adaptation options. This approach allows utilities to assess impacts based on established thresholds when utility operations are disrupted and assets are impacted. Complementing other tools and resources already employed in risk management practices (e.g., models of hydrology and projected demand), utilities can use climate science data to evaluate the plausibility of climate-related impacts and how soon these impacts may affect the utility.



CREAT Process: Application of climate information and utility knowledge to assess risks and challenges presented by climate change.

The CREAT 2.0 framework incorporates available qualitative regional and quantitative (downscaled) local climate information to help inform the utility planning process. The software does not attempt to forecast climate change (e.g., temperature and precipitation changes), but offers a range of potential conditions to consider. Users can consider these scenarios of projected climate change to help identify related impacts important to operations, maintenance, and management.



CREAT provides data and plots for comparing local historical conditions with downscaled climate model projections for each grid cell.

For More Information: CREAT 2.0 is available for download at **www.epa.gov/climatereadyutilities**. For more information, email **CRWUhelp@epa.gov**.

CLIMATE READY WATER UTILITIES EPA

Example: Projected changes in intense precipitation will likely increase the frequency of flood events and the peak influent flows into collection systems following storm events. CREAT provides pre-loaded historical precipitation data and projected changes based on model outputs to help users understand how these events will differ as climate changes. Utility experience regarding how storms have impacted utility assets and operation in the past is key to interpreting the potential impact of these changes in the future. CREAT guides the user through a detailed risk assessment including the selection of adaptation options to reduce consequences from floods and higher peak influent flows. By evaluating benefits (i.e., reduction in risk) of different adaptation options, users can develop effective adaptation plans to prepare for projected changes in storm conditions.

Benefits of CREAT

CREAT helps utilities organize and communicate risks from climate impacts and potential gains from adaptation to decision makers, stakeholders and citizens. Incorporating CREAT results with overall utility planning builds customer confidence that a utility is being proactive in identifying significant risks or gaps where additional planning may be needed.

NEWEA position paper

Sustainable funding for improving our nation's water infrastructure

Ratified April 1, 2009/Updated March 9, 2010/Updated November 18, 2010 by the New England Water Environment Association

NEWEA commends the efforts of the United States Congress to act quickly and decisively on plans to address the infrastructure needs of our nation and revive our economy by including necessary funding for critical and sustainable water and wastewater infrastructure improvement projects in The American Recovery and Reinvestment Act of 2009. We are pleased that the legislation provided $4 billion for wastewater and $2 billion for drinking water infrastructure projects through the Clean Water and Drinking Water State Revolving Loan Funds, but we urge you to continue to provide this support into the future. The enormous need for water and wastewater infrastructure improvements cannot be met through a one-time infusion of funding, however substantial. The time has come for a long-term solution to a long-standing problem.

The issues facing our nation's water quality are in some respects more insidious than ever before. To be certain, great strides in reducing pollution levels have occurred since the inception in 1972 of the Clean Water Act (CWA) through the joint efforts of our federal, state and local governments, citizen support, and the hard work of the wastewater industry. However, there is still much to do. More than 40 percent of our nation's rivers, lakes, streams, and bays are still impaired. We are still in the process of meeting the lofty goals of the Clean Water Act, and recent studies by the U.S. Environmental Protection Agency, the Congressional Budget Office, the Government Accounting Office, and the Water Infrastructure Network all estimate a water infrastructure funding gap exceeding $300 billion over the next 20 years.

We are still in the process of meeting the lofty goals of the Clean Water Act, and recent studies by the U.S. Environmental Protection Agency, the Congressional Budget Office, the Government Accounting Office, and the Water Infrastructure Network all estimate a water infrastructure funding gap approaching $300 billion or more over the next 20 years.

Financially strapped municipalities nationwide need to repair, replace, and rehabilitate aging collection systems, pump stations, and treatment plants, and they need to build new infrastructure.

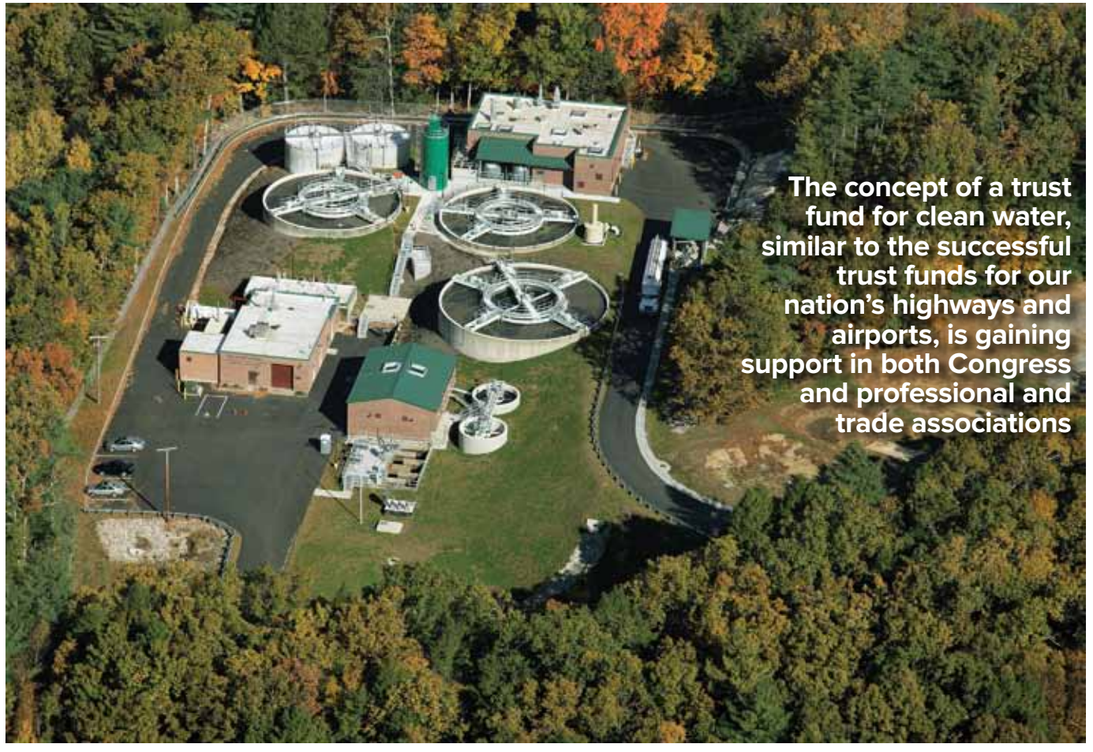
How will this gap be met? In 1987, the Clean Water State Revolving Fund (CWSRF) replaced the grant program that began with the Clean Water Act, and since then, the CWSRF has been the primary federal mechanism to provide funding assistance to local and state programs. Originally authorized only through 1994, the CWSRF has been renewed annually by Congress since it has been successful in its mission, and has become the cornerstone of the financing equation of user fees, local investment, and state assistance. But in recent years, the CWSRF has been experiencing deep funding cuts. With the downward shift in federal support, over 93 percent of the nation's nearly $29 billion in annual costs for capital investment and operation of the nation's water infrastructure is being shouldered by local governments and ratepayers. In the midst of an economic decline, financially strapped municipalities nationwide need to repair, replace, and rehabilitate aging collection systems, pump stations, and treatment plants, and they need to build new infrastructure—all in an effort to comply with increasingly complex regulations designed to protect public health and safeguard the environment. In addition, almost 25% of the nation's population is serviced by decentralized wastewater treatment systems (also known as septic systems) which are also in need of repair and replacement. These systems can be longterm, green solutions to wastewater treatment, but like a centralized treatment facility, they need operation and maintenance.

This combination of aging treatment and distribution facilities with municipalities' lack of financial resources make sufficient federal funding a necessity. A consistent and reliable infusion of capital into sustainable projects that provide jobs and economic growth while protecting public health and environmental quality is needed not only now, but into the future. NEWEA urges Congress to restore funding for the Clean Water State Revolving Loan Funds (SRF) adequate to the defined need. This support, which is in the best interest of the nation, is crucial to protecting the public and environmental health of New England, and it will provide a vital foundation to our local economies.

Furthermore, NEWEA supports the establishment of a sustainable, long-term, deficit-neutral national clean water trust fund dedicated to addressing water quality issues, preserving the nation's water assets, and protecting the investments in clean water made since the enactment of the CWA. The concept of a trust fund for clean water, similar to the successful trust funds for our nation's highways and airports, is gaining support in both Congress and professional and trade associations, such as the National Association of Clean Water Agencies. The reason for such growing support is clear: a trust fund would be the ideal mechanism through which to consistently invest in our nation's wastewater infrastructure. Such investment not only protects public health and the environment but each $1 billion invested in such projects generates more than 47,000 jobs. Such job creation makes sense now, and will continue to make sense in a progressively competitive global economy.

Therefore, in conclusion, NEWEA:

- Supports funding the SRF program adequate to the defined need until an alternative funding mechanism is established
- Supports the trust fund concept to provide substantial long-term funding for water and wastewater infrastructure projects



The concept of a trust fund for clean water, similar to the successful trust funds for our nation's highways and airports, is gaining support in both Congress and professional and trade associations

NEBRA Highlights

Required recycling of food waste proliferates in New England

In 2014, three New England states' bans on the landfill disposal of some food waste will go into effect.

On January 1, Connecticut's requirement for composting of certain source-separated organics went into effect. However, it does not require diversion until there are composting facilities with capacity to manage the material. The initial law was passed by the legislature in 2011 and amended in 2013. As noted in legislative documents, any "commercial food wholesaler or distributor, industrial food manufacturer or processor, supermarket, resort or conference center located not more than 20 miles from an authorized source separated organic material composting facility and that generates an average projected volume of not less than 104 per year [two tons/week average] of source-separated organic materials shall: (A) Separate such source-separated organic materials from other solid waste; and (B) ensure that such source-separated organic materials are recycled at an authorized source-separated organic material composting facility that has available capacity and that will accept such source-separated organic material." In 2020, the Connecticut law will require all facilities generating 52 tons (one ton per week average) to recycle their source-separated organics.

July 1 is the first deadline for implementation of Vermont's new organics diversion, which is part of Act 148 and is similar to Connecticut's law. As of that date, facilities generating more than 104 tons/year of food scraps must divert this waste if a certified composting or anaerobic digestion (AD) facility with available capacity exists within 20 miles. In future years, diversion will be required for smaller and smaller amounts of food scraps, so that by July 1, 2017, any generator of more than 18 tons/year (~⅓ ton/week) must divert it. By 2020, all food scraps, including those from households, will have to be recycled, and there will be no exemption for distance to a composting or AD facility.

On October 1, the Massachusetts commercial food waste disposal ban goes into effect. It requires diversion from landfill to recycling of food and vegetative material from businesses and institutions that dispose of one ton or more organic material per week.

And now Rhode Island is joining in. A new law, H7033, is under consideration in the current legislative session. As in Connecticut and Vermont, the proposed Rhode Island law would require diversion of large amounts of organics (food waste) only if a composting site or food digester exists within 20 miles. According to "ecoRI" news, "Currently, Rhode Island only has one commercial-scale composting site, in Charlestown, that takes food scrap. A large facility also exists in Norton, Mass." Over time, the Rhode Island law would require generators of smaller amounts of organics to recycle them, so that, in 2021, all organics would be recycled.

What is driving these bans on landfilling of organic wastes? The key reasons are (as noted in a Vermont Department of Environmental Conservation fact sheet):

- Waste diversion rates have stagnated (30 to 36 percent in Vermont over the past 10 years)
- A significant portion of the waste stream that is disposed of comprises recyclable items, leaf and yard debris, and food scraps that could be diverted from landfills and better used
- Landfilling these materials (especially food scraps) contributes to climate change by producing greenhouse gas emissions
- Landfill space is limited (e.g., in Vermont, one of the two major landfills is nearing capacity)
- Recycling—including composting and AD—stimulates more local jobs and creates marketable products, stimulating the economy

While the other three states are cautious about the chicken-and-egg conundrum (Can you impose a ban on landfilling if there is no place for the diverted waste to go?), Massachusetts is not letting any large food-waste generator off the hook: All must divert as of October 1. MassDEP gave the following rationale for this position in response to comments on the draft regulations:

"Massachusetts has implemented a number of changes to foster the development and siting of new composting and anaerobic digestion capacity, including regulation changes, several loan and grant programs, and changes to the Renewable Portfolio Standard to improve the ability of anaerobic digestion facilities to earn high value renewable energy credits. Further initiatives in this area are described in MassDEP's Organics Action Plan. There are a number of compost sites that will take food waste now, and a growing number of haulers that offer food waste collection services. In addition, it is important to recognize that many of the businesses and institutions potentially subject to the ban have already taken steps to reduce food waste disposal to some degree.... It is also important to recognize that there is a wide range of options for businesses and institutions to comply with the ban and do so in a cost-effective way, including reducing food waste in the first place, donating servable food, employing on-site systems, and sending to a variety of off-site facilities, including anaerobic digestion facilities, compost facilities, and animal feed operations. The continued implementation of the ban will drive development of additional capacity, which will further reduce hauling costs and make these programs even more cost-effective."

How do these efforts relate to wastewater treatment and biosolids management?

Managing food scraps is not that different from managing wastewater solids: they break down quickly, can be odorous, and are wet, and management is regulated and requires care. Wastewater treatment facilities that process solids have experience that can be valuable to food-scrap processors. And excess AD capacity at wastewater treatment plants is a relatively easy way for diverted food waste to be processed. In Massachusetts, MWRA's, GSLD's, and other facilities with AD are evaluating taking in outside wastes such as food scraps—and the state agencies are relying heavily on these processing facilities for the success of the new organics diversion program.

The other interaction between the new organics diversion efforts and biosolids management is in the end-product market. Biosolids composts and heat-dried pellets are high-nutrient, consistent products widely used throughout the region. The increased diversion of other organics—food waste—will increase the volume and variety of compost and other residuals products (e.g. digestate) on the market. NEBRA has expressed concern to regulatory agencies in Massachusetts and Vermont regarding how these various new products will be regulated and how their regulation will compare to the strict regulations on biosolids products. NEBRA urges consistency of regulations applied to all organic residuals products, including biosolids and food scraps, so that those processing the increasing volumes of organics can do so efficiently, with diverse feedstocks that enhance digestion and composting and create the best products possible.

NEWEA Annual Conference biosolids highlights

Ten years of sustainable biosolids management at Greater Lawrence Sanitary District (GLSD). GLSD presents an excellent example of a turnaround in solids management. In the 1990s, the facility was transporting thickened sludge to other New England facilities for further treatment and disposal and transporting dewatered cake solids as far as northern Maine and Quebec for landfill disposal. Since a major $32-million installation of anaerobic digestion and thermal drying systems was completed a decade ago, GLSD has recycled 100 percent of its biosolids—including 100-percent agricultural use in Massachusetts in 2013. The new solids processing train seeks to maximize the energy and nutrient value of the biosolids, and has reduced GLSD's costs by more than $1 million annually. As presenters Ben Mosher and Michael Walsh (CDM Smith) noted, innovative technology combined with a creative application of conventional and alternative project delivery systems achieved major environmental, community, and cost benefits for GLSD and its member communities.

Research at UMass on co-digestion of wastewater solids and food waste. This work in the lab of Dr. Chul Park continues, providing data for the Massachusetts Water Resources Authority (MWRA) as it plans a pilot project to process pulped food waste in one of its 12 egg-shaped anaerobic digesters. Presenter Camilla Kuo-Dahab nicely presented data that corroborates other research showing great net energy benefits in co-digesting food waste.

Energy Neutral Water Resource Recovery Facilities—Results From WERF research. This presentation by Christine Polo (Black & Veatch) was the first public presentation of initial data and findings from this large WERF research project, which aims to provide information and guidance on how water-resource-recovery facilities (WRRFs) can become energy neutral. NEBRA has been involved in this project, helping develop a triple-bottom-line tool for evaluating biosolids management options.

Primary treatment is the key to attaining energy neutrality. The optimization of the anaerobic digestion (AD) process is getting more attention. In this presentation by Ed Kobylinski (Black & Veatch), the focus was on removing as much of the solids as possible in primary treatment. This maximizes the recovery of that energy via AD and minimizes the remaining solids that need to be treated in the energy-intensive secondary process. In nutrient-removal plants, a challenging balance must be reached, because they require a certain amount of carbon. Striking this balance can result in very net-energy-efficient plant operations.

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For more information or to subscribe to NEBRAMail, NEBRA's email newsletter visit nebiosolids.org

WEF Delegate Report

WEFTEC 2013 was held in Chicago, IL

NEWEA was very well represented throughout WEFTEC 2013, held in October, in Chicago, with more than 22,000 water-quality professionals attending. At the conference, all the WEF Delegates participated in a day of training sessions and committee meetings. This year the House of Delegates (HOD) has selected the following four work groups as its focus:

- Member Association (MA) Leadership Development
- MA Financial Sustainability
- HOD Strategic Planning
- Non-Dispersibles

Vivian Matkivich, Dan Bisson, and Phyllis Rand at WEFTEC

Phyllis Rand is working on the strategic planning work group, which formed three sub-groups to address the Operational Plan. The three subgroups are: mentoring, training, and development of delegates; improving the process of soliciting input from MAs; and improving HOD meetings and work groups. Phyllis Rand is the leader of sub-group No. 1. The recommendations from these work groups will be vetted at the 2014 WEFMAX meetings beginning in February. Howard Carter is again serving on the non-dispersibles work group, which will continue its partnership with the HOD, WEF collection committee members, and the Committee Leadership Council (CLC) executive committee to address the issues regarding non-dispersibles entering the collection system. Howard is also the chair of the HOD nominating committee. Jenn Lachmayr is the leader of the leadership development work group. The goal of this work group is to assess training needs for the leadership of MAs. We hope to expand on available resources from all MAs and WEF, and provide them in an easily accessible form. Our first step is to ask MAs which leadership development items they (the MAs) think are areas in which WEF HOD help would be needed.

Also, Dan Bisson, Jim Barsanti, and Elizabeth Cutone gave WEF officers an overview of the processes that NEWEA used to make recent successful changes to the association's governance structure.

The NEWEA Luncheon on the Monday of WEFTEC proved to be a big success, as usual, with a packed house offering members an opportunity to network and catch up with old friends. President Michael Bonomo provided an overview of the latest NEWEA activities. He was followed by WEF Delegate Jennifer Lachmayr, who shared WEF delegate plans for the coming year. Finally, WEF Senior Marketing Manager Linda Kelly shared the latest regarding the Water's Worth It™ campaign.

Operations Challenge once again was a highlight of the week. Forty-one teams slugged it out for the opportunity to be the best in the land. All three NEWEA teams performed well and made us proud. Two New England teams received impressive hardware for the process control event at the Operations Challenge awards ceremony.

Other items of interest from the HOD meeting include:

- Dues Increase. It has been 10 years since the last increase in WEF Membership dues, and the WEF board of trustees voted an increase to go into effect in 2014. More details will follow but an example increase for a single membership is from $88/year to $101/year.
- Water Advocates. This is WEF's feature public awareness program for 2014. It is aimed at providing tools and techniques for all members to share knowledge about our industry with government decision-makers and the public regarding the importance of water. More information can be found at wateradvocates@wef.org. This program will aid NEWEA's public awareness efforts as well.

In closing, we thank a couple of outgoing NEWEA officers: Greg Cataldo, WEF delegate, and John Hart, WEF board of trustees. Both gentlemen will be greatly missed. We would also like to welcome our newest WEF officers from NEWEA: Phyllis Arnold Rand, WEF delegate, and Erin Mosley, WEF board of trustees.

Upcoming meetings & events

WEFMAX (NJ)
March 26-28
Weekawken, NJ

EXECUTIVE COMMITTEE MEETING
with all Chairs w/NEWWA Tradeshow
April 3, 2014
Hilton Garden Inn,
Worcester, MA

NEWEA MICROCONSTITUENTS SEMINAR
April 15, 2014
Bentley University, Waltham, MA

OPERATOR TRAINING DAY
April 25, 2014
Holyoke WPCF

NEWEA ENERGY & SUSTAINABILITY CONFERENCE
May 7-8, 2014
Publick House, Sturbridge, MA

ASSET MANAGEMENT SEMINAR
June 26, 2014
NH DES, Portsmouth, NH

THE NEWEA 2014 SPRING MEETING & EXHIBIT

June 1–4, 2014
Samoset Resort, Rockport, Maine

The NEWEA 2014 Spring Meeting & Exhibit offers three days of technical sessions, exhibit displays, tours, the Operations Challenge competition and a chance to network with other wastewater professionals in a relaxed setting.

NEWEA CONGRESSIONAL BREAKFAST

April 9, 2014 • Rayburn House Office Building, Washington, DC

The NEWEA Congressional Briefing is the annual hallmark for the Association and its Government affairs program. Mark your calendar to join us on April 9, 2014.

This is a great opportunity for our membership and elected officials to join together to discuss water, wastewater and stormwater infrastructure issues facing communities of the Northeast. We look forward to meeting with you and providing you with the latest information affecting our industry. Your involvement is critical—come to D.C. and be heard.

Attending the Briefing will allow:

- Opportunities to meet with senators, representatives and legislative staff
- Substantive discussion of federal clean water legislative initiatives and opportunity to provide feedback related to the impact that these initiatives have on our communities and the water quality industry
- A forum for presentation and discussion of the NEWEA Position statements
- Opportunities to learn about key federal regulatory initiatives;
- A forum to provide comments directly to regulatory leaders form EPA's Washington, DC Headquarters

In addition to the Briefing Breakfast, an important part of this day is holding individual meetings with senators and representatives on the Hill. If you plan to attend the briefing, the Government Affairs Committee will work with you to schedule these individual appointments.

AFFILIATED STATE ASSOCIATIONS AND OTHER ASSOCIATION MEETINGS

CONNECTICUT LEGISLATIVE BREAKFAST
March 5, 2014
Armory, Hartford, CT

MASSACHUSETTS LEGISLATIVE BREAKFAST
March 6, 2014
Omni Parker House, Boston, MA

NEW HAMPSHIRE LEGISLATIVE BREAKFAST
March 6, 2014
Holiday Inn, Concord, NH

MWPCA QUARTERLY MEETING
March 20, 2014
Devens Common Center,
Devens, MA

NARRAGANSETT LEGISLATIVE MEETING
March 25, 2014
Crowne Plaza, Warwick, RI

NEWWA TRADE SHOW
April 2-3, 2014
DCU Center, Worcester, MA

NATIONAL SCIENCE TEACHERS ASSOCIATION MEETING
April 3-6, 2014
Boston, MA

NHWPCA TRADE SHOW
April 10, 2014
Executive Court Banquet Facility,
Manchester, NH

MWWCA SPRING CONFERENCE
April 18, 2014
Black Bear Inn, Orono, ME

CWPAA TRADE SHOW
April 24, 2014
New Life Church, Wallingford, CT

NARRAGANSETT WPCA AWARDS BANQUET
May 9, 2014
Potowomut Country Club, Warwick, RI

GMWEA SPRING MEETING
May 22, 2014
Killington Grand Hotel, Killington, VT

Thank you

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NEWEA appreciates these industry leaders who have helped make a positive impact on the water environment this year. **Is your company ready to join us in 2014?**

Sponsorship benefits at all levels include:

- Increased corporate visibility and marketing opportunities to a wide audience of water quality industry professionals
- Relationship-building access to key influencers involved in advancing water quality industry services, technology, and policy
- Recognition as an environmental leader among peers and customers
- Exposure at NEWEA's most popular events including the Annual Conference and golf tournaments

For more information or to join NEWEA's 2014 Annual Sponsor Program, contact Elizabeth Cutone:

EMAIL: ecutone@newea.org
CALL: 781-939-0908

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NEWEA Membership Application 2014

Water Environment Federation the water quality people®

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Personal Information

Last name M.I. First Name (jr. sr. etc)

Business Name (if applicable)

Street or P.O. Box (☐ Business Address ☐ Home Address)

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☐ Check here if renewing Member I.D. (please provide)

**By joining NEWEA you also become a member of the Water Environmental Federation (NEWEA is a member Association of WEF)

Employment Information (see back page for codes)

1. ORG Code: Other (please specify): 2. JOB Code: Other (please specify):

3. Focus Area Codes: Other (please specify:

Signature (required for all new memberships) *Date*

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Membership Categories (select one only)

		Member Benefit Subscription	Dues
☐ **Professional Package**	Individuals involved in or interested in water quality	■ *WE&T* (including *Operations Forum*) ■ *WEF Highlights Online*	$139
☐ **Young Professional Package**	New WEF members or formerly WEF Student members with 5 or less years of experience in the industry and less than 35 years of age. This package is available for 3 years.	■ *WE&T* (including *Operations Forum*) ■ *WEF Highlights Online*	$66
☐ **Professional Wastewater Operations (PWO) Package**	Individuals in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec.	■ WE&T (including *Operations Forum*) ■ *WEF Highlights Online*	$86
☐ **Academic Package**	Instructors/Professors interested in subjects related to water quality.	■ *WE&T* (including *Operations Forum*) ■ *WEF Highlights Online* ■ *Water Environment Research* (Online)	$139
☐ **Student Package**	Students enrolled for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	■ *WE&T* (including *Operations Forum*) ■ *WEF Highlights Online*	$10
☐ **Executive Package**	Upper level managers interested in an expanded suite of WEF products/services.	■ *WE&T* (including *Operations Forum*) ■ *World Water* ■ *Water Environment Research* (Online) ■ *Water Environment Regulation Watch*	$335
☐ **Dual**	If you are already a member of WEF and wish to join NEWEA		$38
☐ **Corporate Membership** (member benefits for one person)	Companies engaged in the design, construction, operation or management of water quality systems. Designate one membership contact.	■ *WE&T* (including *Operations Forum*) ■ *Water Environment Research* (Print) ■ *Water Environment Regulation Watch* ■ *WEF Highlights Online*	$390

Additional Subscriptions

Consider including additional WEF resources in your membership package! Check the appropriate subscription and include the subscription cost in your payment.
NOTE: prices listed reflect a substantial member discount!

*Water Environment Research Premium includes WER Online, plus online archives of all WER issues from 1928 – 2004.

☐ *WE&T* (including Operations Forum)	$55	$_____
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Dependant upon your membership level, $10 dollars of your membership dues is allocated towards a subscription to the NEWEA Journal.

NEWEA Membership Codes 2014

To help us serve you better, please complete the following:
(choose the one that most closely describes your organization and job function)

What is the nature of your ORGANIZATION?

(circle one only) (ORG)

1
Municipal/district Water and Wastewater Systems and/or Plants

2
Municipal/district Wastewater Only Systems and/or Plants

3
Municipal/district Water Only Systems and/or Plants

4
Industrial Systems/Plants (Manufacturing, Processing, Extraction)

5
Consulting or Contracting Firm (e.g., Engineering, Contracting and Environmental)

6
Government Agency (e.g., U.S. EPA, State Agency, etc.)

7
Research or Analytical Laboratories

8
Educational Institution (Colleges and Universities, libraries, and other related organizations)

9
Manufacturer of Water/Wastewater Equipment or Products

10
Water/Wastewater Product Distributor or Manufacturer's Rep.

11
Stormwater (MS4) Program Only

12
Other _____
(please specify)

What is your Primary JOB FUNCTION?

(circle one only) (JOB)

1
1. Upper or Senior Management (e.g., President, Vice President, Owner, Director, Executive Director, General Manager, etc.)

2
Engineering, Laboratory and Operations Management (e.g., Superintendent, Manager, Section Head, Department Head, Chief Engineer, Division Head, etc.,)

3
Engineering and Design Staff (e.g., Consulting Engineer, Civil Engineer, Mechanical Engineer, Chemical Engineer, Planning Engineer, etc.)

4
Scientific And Research Staff (e.g., Chemist, Biologist, Analyst, Lab Technician, etc.)

5
Operations/Inspection & Maintenance (e.g., Shift Supervisor, Foreman, Plant Operator, Service Representative, Collection Systems Operator, etc.)

6
Purchasing/Marketing/Sales (e.g., Purchasing, Sales Person, Market Representative, Market Analyst, etc.)

7
Educator (e.g., Professor, Teacher, etc.)

8
Student

9
Elected or Appointed Public Official (Mayor, Commissioner, Board or Council Member)

10
Other _____

What are your KEY FOCUS AREAS?

(circle all that apply) (FOC)

1
Collection Systems

2
Drinking Water

3
Industrial Water/Wastewater/ Process Water

4
Groundwater

5
Odor/Air Emissions

6
Land and Soil Systems

7
Legislation (Policy, Legislation, Regulation)

8
Public Education/Information

9
Residuals/Sludge/Biosolids/Solid Waste

10
Stormwater Management/ Floodplain Management/Wet Weather

11
Toxic and Hazardous Material

12
Utility Management and Environmental

13
Wastewater

14
Water Reuse and/or Recycle

1
Watershed/Surface Water Systems

16
Water/Wastewater Analysis and Health/ Safety Water Systems

17
Other _____

Optional Items (OPT)

Years of industry employment? _____
1 (1 to 5) **2** (6 to 10) **3** (11 to 20) **4** (21 to 30) **5** (>30 years)

Year of birth? _____

Gender? _____
1 Female **2** Male

Education level? (ED) _____
1 High School **2** Technical School **3** Some College **4** Associates Degree **5** Bachelors Degree **6** Masters Degree **7** JD **8** PhD

Education/Concentration Area(s) (CON) _____
1 Physical Sciences (Chemistry, Physics, etc.) **2** Biological Sciences **3** Engineering Sciences **4** Liberal Arts **5** Law **6** Business

Water quality professionals, with fewer than 5 years working experience and are under the age of 35, are eligible to join WEF as an Active Member, while participating in the NEWEA/WEF Young Professionals Program. This program allows up to 50% off of the Active Member dues, valid for the first three years of membership. This program is available for new member applicants and Student Members.

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