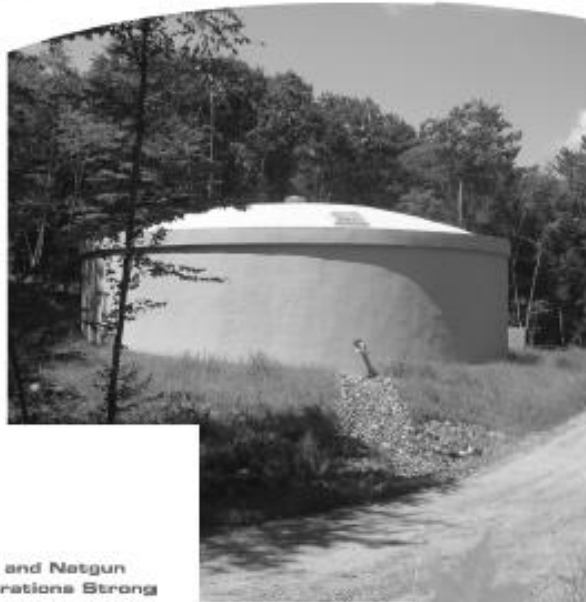


Front Cover

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# **Journal of the New Hampshire Water Works Association**

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**18 N. Main St., Suite 308, Concord, NH 03301**

**(603) 415-3959**

**nhwwa@worldpath.net**

**www.nhwwa.org**

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Thomas Bowen, Manchester	1995-1996
Keith Bossung, Hampton	1996-1997
Victoria Abbey Del Greco, Exeter	1997-1998
Edwin Betz, Littleton	1998-1999
Pierre C. Lavoie, Dover	1999-2000
Bernard Rousseau, Nashua	2000-2001
Robert Beaurivage, Manchester	2001-2002
Sharon Ostrander, Lyndeborough	2002-2003
David Brennan, Sunapee	2003-2004
Brian Wilson, Ti-SALES, Inc.	2004-2005
Thomas Cravens, Portsmouth	2005-2006
Lee Minnich, Goffstown	2006-2007
Brian Goetz, Portsmouth	2007-2008
David Paris, Manchester	2008-2009
Philip Bilodeau, Concord	2009-2010
Steve Guercia, Secondwind Water Systems	2010-2011
Michael Metcalf, Underwood Engineers, Inc.	2011-2012
Marco Philippon, Westford, MA Water Dept.	2012-2013
William Boulanger, Dover Water Department	2013-2014

\*Deceased



# Water Works Superintendents and Other Officials

## STATE OF NEW HAMPSHIRE

<b>Town</b>	<b>System</b>	<b>Name</b>
Alton	Alton Water Works	William Curtin
Amherst	Amherst Village District	Chris Countie
Andover	Andover Water Works	Todd Cartier
Antrim	Antrim Precinct	Jim Cruthers
Ashland	Ashland Water Works	Russell Cross
Bartlett	Bartlett Village Precinct	Scott Hayes
Bartlett	Lower Bartlett Precinct	Gary Chandler
Bath	Bath Village Water Works	Spencer Richardson
Belmont	Belmont Water Works	Jim Fortin
Bennington	Bennington Water Dept.	Jim Cruthers
Berlin	Berlin Water Works	Craig Carrigan
Bethlehem	Bethlehem Village District	Terence Welch
Boscawen	Penacook-Boscawen Water	Peter Miner
Bow	Bow Municipal Water System	Stuart Harkins
Brentwood	Rockingham County Home	Tom Schulte
Bristol	Bristol Water Works	Jeffrey Chartier
Campton	Campton Village Precinct	Joseph Vaillancourt
Campton	Waterville Estates Village District	Corey Smith
Canaan	Canaan Water Department	John Coffey
Carroll	Carroll Water Works	Scott Sonia
Carroll	Rosebrook Water System	Nancy Oleson
Charlestown	Charlestown Water Works	Dave Duquette
Charlestown	N. Charlestown Water Works	Dave Duquette
Claremont	Claremont Water Works	Robert Lauricella
Colebrook	Colebrook Water Works	Kevin McKinnon
Concord	Concord Water Resources	Phil Bilodeau
Contoocook	Contoocook Water Precinct	Steve Clough
Conway	Conway Village Fire Precinct	Gregg Quint
No. Conway	N. Conway Water District	David Bernier
E. Conway	Fryeburg Maine Water Co.	John Hastings
Derry	Derry Water Works	Thomas Carrier
Dover	Dover Water Works	Doug Steele
Durham	UNH/Durham Water Works	Wesley East
Enfield	Enfield Village Fire Precinct	Bruce Prior
Epping	Epping Water Works	Norman Dionne

<b>Town</b>	<b>System</b>	<b>Name</b>
Epsom	Epsom Village District	Joe Damour
Errol	Erroll Water Works	Lawrence Enman
Exeter	Exeter Water Works	Paul Roy
Farmington	Farmington Water Dept.	Dale Sprague
Fitzwilliam	Fitzwilliam Village Water District	Joseph Damour
Francestown	Francestown Village Water	Dennis Orsi
Franconia	Franconia Water Works	Tom Mason, Jr.
Franklin	Frankin Water Works	Brian Sullivan
Freedom	Freedom Water Precinct	Francis Lyons
Georges Mills	Sunapee Water Works	Dave Bailey
Gilford	Gilford Village Water District	Norm Harris III
Gilford	Gunstock Acres	Alex Crawshaw
Goffstown	Goffstown Village Fire Precinct	Lee Minnich
Goffstown	Grasmere Village Water Precinct	Keith Moore
Gorham	Gorham Water Works	David Patry
Grantham	Village District of Eastman	Tim Hicks
Greenville	Greenville Water Works	Gerald Curran
Hampton	Aquarion Water Co.	Carl McMorran
Hancock	Hancock Water Works	Kurt Grasset
Hanover	Hanover Water Works Co.	Todd Cartier
Haverhill	Haverhill Corner Precinct	Robert Fagnant
No. Haverhill	N. Haverhill Water & Light	Robert Fagnant
Haverhill	Woodsville Water & Light Precinct	Robert Fagnant
Henniker	Cogswell Springs Water Works	Norman Bumford
Hill	Hill Water Works	John Benham
Hillsborough	Hillsborough Water Works	Douglas Parker
Hillsborough	Emerald Lake Village District	Joe Damour
Hinsdale	Hinsdale Water Works	Dennis Nadeau
Hooksett	Hooksett Village Water Precinct	David Foote
Hooksett	Central Hooksett Water Precinct	Jay Smith
Hopkinton	Hopkinton Village Precinct	Joe Damour
Jackson	Jackson Water Works Company	Scott Hayes
Jaffrey	Jaffrey Water Works	Tom Lambert
Keene	Keene Water Works	James Donison
Laconia	Dockham Shores Estates	Colin Robertson
Laconia	Laconia Water Works	Seth Nuttelman
Lancaster	Lancaster Water Works	Timmy Bilodeau
Lebanon	Lebanon Water Works	Jim Angers

<b>Town</b>	<b>System</b>	<b>Name</b>
Lincoln	Lincoln Water works	William Willey
Lisbon	Lisbon Village District	Terence Welch
Littleton	Littleton Water & Light Dept.	Tom Considine
Madison	Village District of Eidelweiss	Ronald Sandstrom
Manchester	Manchester Water Works	David Paris
Marlboro	Marlboro Water Works	Sly Karasinski
Meredith	Meredith Water Dept.	Daniel Leonard
Meriden	Meriden Village Water District	Bill Taylor
Merrimack	Merrimack Village Water District	Ronald Miner, Jr.
Milford	Milford Water Utility	Dave Boucher
Milton	Milton Water Works	Mark Badger
Monroe	Monroe Water Department	Robert Fagnant
Nashua	Pennichuck Water Works	Chris Countie
New Castle	New Castle Public Works Dept.	Steve Scotton
Newfields	Newfields Village Water & Sewer	Peter Hellfach
New Hampton	New Hampton Village Precinct	Joseph Powers
New London	New London/Springfield Water	Rob Thorp
Newmarket	Newmarket Water Works	Sean Grieg
Newport	Newport Water Department	Bob Naylor
Northumberland	Groveton Village Precinct	Reginald Charron
Orford	Orford Village District	Bill McKee
Center Ossipee	Center Ossipee Water Precinct	Doug Sargent
Pembroke	Pembroke Water Works	Matt Gagne
Peterborough	Peterborough Water Works	Nate Brown
Pittsburg	Pittsburg Water District	Richard Sargent
Pittsfield	Pittsfield Aqueduct Company	Chris Countie
Plainfield	Plainfield Water District	Carl Colburn
Plymouth	Plymouth Village Water Works	John Crowley
Portsmouth	Portsmouth Water Works	Steve Scotton
Raymond	Raymond Water Works	Scott Keddy
Rochester	Rochester Water Works	Michael Bezanson
Rollinsford	Rollinsford Water District	Scott McGlynn
Rye	Rye Water District	Kenneth Aspen
Salem	Salem Water Works	Frank Giordano
Seabrook	Seabrook Water Works	Curtis Slayton
Somersworth	Somersworth Water Works	Scott Keddy
Stewartstown	W. Stewartstown Water Works	Wilman Allen
Stratford	No. Stratford Water	Carleton Harris

<b>Town</b>	<b>System</b>	<b>Name</b>
Sunapee	Sunapee Water Works	Dave Bailey
Swanzey	No. Swanzey Water & Fire Precinct	Sly Karasinski
Tamworth	Tamworth Water works	Tom Mason, Jr.
Tilton	Tilton/Northfield Water District	John Chase
Troy	Troy Water Works	Justin Frazier
Wakefield	Sanbornville Water Department	Dean Giffin
Walpole	Walpole Water Department	Mark Houghton
No. Walpole	No. Walpole Village District	Robert McGuiirk
Warner	Warner Village Fire District	Joseph Damour
Waterville Valley	Waterville Valley Water Dept.	Robert Burhoe, Jr.
Whitefield	Whitefield Village Precinct	Bill Thompson
Wilton	Wilton Water Works	Michael Bergeron
Winchester	Winchester Water Works	Richard Meleski
Wolfeboro	Wolfeboro Water & Sewer Dept.	Scott Pike
Woodstock	Woodstock Water Works	Steve Welch
Woodsville	(See Haverhill)	

**Philip W. Croasdale, CPA  
185 Westwood Drive  
Manchester, NH 03103  
Tel. 603-622-2127**

To the Board of Directors  
New Hampshire Water Works Association, Inc.  
Concord, NH

This is to certify that I have compiled the statement of activities and cash and cash equivalents of the New Hampshire Water Works Association, Inc. for the year ended October 31, 2014.

I have reconciled the account balances to those presented in the cash disbursement and receipts journals. I found the checkbook balances of the general and legislative accounts to agree with the bank statements as of October 31, 2014 and the balance shown in the savings accounts to agree with the certificate of deposits on file.



Philip W. Croasdale, CPA

March 13, 2015

**NEW HAMPSHIRE WATER WORKS ASSOCIATION, INC.  
STATEMENT OF ACTIVITIES AND CASH AND CASH EQUIVALENTS  
FOR THE YEAR ENDED OCTOBER 31, 2014**

Revenue and support:	
NHWWA membership fees - general	\$ 16,590
NHWWA membership fees- legislative	16,896
State and local grants	26,200
Trade fair and exposition	33,359
Operator training seminars	37,885
Basic operator course	15,300
Technical seminars	9,475
Construction Day Field Trip/ NHDWW	5,335
Advertising - NHWWA Journals and newsletters	14,699
Interest income	43
	<hr/>
Total revenue and support	175,782
Expenses:	
Program services:	
Trade fair and exposition	15,041
Operator training seminars	48,585
Basic operator course	2,481
Technical seminars	5,864
Construction Day Field Trip/ NHDWW	4,165
NHWWA Journals and newsletters	10,093
General:	
Salaries and wages	81,822
Payroll taxes	6,299
Rent	5,400
Printing and postage	3,640
Office supplies/ expenses	3,269
Telephone	721
Travel expense	1,614
Insurance	2,198
Professional services	575
Taxes, filing fees	606
	<hr/>
Total expenses	192,373
	<hr/>
Net deficit	\$ <u>(16,591)</u>
Cash and cash equivalents, November 1, 2013	\$ 61,592
Deduct: net deficit	<u>(16,591)</u>
Cash and cash equivalents, October 31, 2014	<u>\$ 45,001</u>

# Water Works Operator Certification 2014

Currently there are about 1000 operators of public water system treatment plants and distribution systems licensed by the State of New Hampshire. New Hampshire operators were required to renew their licenses in December 2013. License renewal is required every two years.

Operators renew their certification by obtaining continuing education units (CEU's). New Hampshire Water Works Association provides its members, and all who are interested, an opportunity to obtain CEU's by attending training sessions throughout the year. In addition, CEU's can be obtained by attending NHWWA technical meetings, management seminars, "Construction Day", and other special events. These programs offer a variety of technical, operational, managerial, safety and human relations classes.

Following are those who were certified by examination or reciprocity in 2014.

## Combined Distribution and Treatment C1A

Matthew T. Ashnault	Roger J. Fadden	Randal L. Moore
John P. Astholz	William R. Farrell	Wayne B. Nichols
Richard J. Bedore	Abigail T. Fopiano	Seth S. Prescott
Michael T. Benoit	Ronald E. Gagnon, Jr.	Thomas D. Richardson
Travis A. Bergeron	Daniel S. Gaynor	Pierre F. Rousseau
Andrew P. Callaghan	Matthew S. Hayes	Dustin P. Sciacca
Justin J. Collins	Daniel F. Hrobak	David A. Sclama
Sue Ann Connary	Rachael L. Hudson	Crystal L. Staresina
Jeremy S. Cornell	Jeremy J. Huesman	Andrew J. Stenberg
Joseph M. Daltorio	Stuart G. Johnson	Jaime C. Thompson
Michael J. Damery	Audrius Kazenas	Jonathon Vitrano
James W. Dawson	Holly A. MacDonald	David T. Wholey
David Dovholuk	Michael E. Martel	Chris M. Yergeau
Jeffrey D. Durell	Brian J. McCall	
Dennis P. Edgecomb	Tanya D. McIntire	
George R. Fadden	Mitchell B. Mencis	

## **Distribution Grade I**

Mark W. Allen	Jill M. Lavoie	Alan W. Piper
Eric B. Defelice	Arthur G. Manock	James M. Quinn
Curtis C. Gordon	Justin P. McCarthy	Jeremy P. Reinbold
George E. Flanders	Nathaniel M. Mears	Kathy L. Rodgers
John J. Foss	Matthew S. Miller	Robert C. Rosselli
David J. Harris	Marc A. Moore	Laurie A. Stevens
Michael D. Hoage II	Erik J. Nau	Scott A. Sykes
Clifford C. Jones	Jeremy H. Nicolaisen	Gerald M. Vachon
Curtis R. King	Michael J. Nugent	
Jason A. Lavoie	Ryan R. Pelissier	

## **Treatment Grade I**

Adam M. Boynton	Jill M. Lavoie
Gerald M. Browning	Ian B. McClellan
Eric B. Defelice	Kathy L. Rodgers
Clifford C. Jones	Laurie A. Stevens
Curtis R. King	

## **Treatment Grade II**

John M. Bridgmon  
Peter B. Hartshorn  
Peter T Wilson

## **Distribution Grade III**

Kenneth W. Deal  
Michael J. Landry  
Thomas R. Selling

## **Treatment Grade III**

Thomas R. Selling

## **Treatment Grade IV**

Shawn D. Rock



# **THE CITY OF PORTSMOUTH'S WATER EFFICIENCY EFFORTS**

by Brian F. Goetz – Deputy Director of Public Works

## **Overview of Portsmouth Water System and History of Water Efficiency Efforts**

The Portsmouth, NH Water System is a regional water system serving the Seacoast communities of Portsmouth, Greenland, New Castle and Newington, and portions of Durham, Madbury and Rye. The history of water service in Portsmouth dates back over 200 years. Original service to City residents was developed in 1797 by entrepreneurs to serve the need for potable water service in the concentrated areas of downtown Portsmouth, and also to serve the expanding brewing industry in the City. In 1891 the City acquired the assets of the Portsmouth Aqueduct Company and has been the system owner and operator since then.

Water mains consist predominantly of cast iron or ductile iron pipe. The water distribution system has a total of approximately 190 miles of water main ranging in diameter from 2-inch to 24-inch pipe. There are 1,000 public fire hydrants and nearly 2,500 valves in the system.

The first documented effort to promote water conservation and efficiency occurred in 1871 when a communication was sent by the water company to the City Council and the local paper requesting people to conserve water. In 1911 the Water Commission recommended that meters be installed to cut down on water consumption. By 1913, nearly 300 individual customer meters had been installed. By 1920, the entire system was metered and subsequently, water consumption was reduced by 14%.

## **Water Usage and Customer Demographics**

The Portsmouth water system has approximately 8,250 customers including over 1,000 commercial/industrial customers. A comprehensive rate study conducted by the City analyzed 2012 customer data to determine water usage in the area. This analysis revealed that commercial and industrial customers used 55% of the water consumed in the system. Residen-

tial accounts used 37% of the water. On average, a single-family residential customer used five units of water a month, or 133 gallons-per-day. The system serves 738 multi-family accounts ranging from duplexes to condominium and apartment complexes. An analysis of these customers revealed that if they were all individually metered then the 738 multi-family accounts would become 4,500 individually metered accounts. The following table summarizes the Portsmouth water system's usage demographics for 2012:

Customer Classification	Total Accounts	Total Gallons per Day	Average Gallons per Day per Account
Single Family Residential	5,932	788,956	133
Multi Family Residential	738	398,520	540
Irrigation	231	65,835	285
Commercial	879	1,134,789	1,291
Industrial	80	759,600	9,495
Municipal	78	41,340	530
Water Districts	2	123,864	61,932

The water supply sources for the system consist of the Bellamy Reservoir and Water Treatment Facility in Madbury, and eight sand and gravel wells. Total yield of the system is approximately 7.6 million gallons per day. Average system pumpage from 2012 to 2014 was 4.5 million gallons per day. The City has also been proactive with the management of the water system through updating its water system master plan every ten years and investing in infrastructure, which included the construction of a LEED-certified water treatment facility in 2011, a total cost of \$23 million. Current system upgrades include the replacement of the Hobbs Hill elevated water storage tank, the upgrade to Madbury Well #2 and #3 pump stations, and the replacement of Madbury #4 and Greenland Wells.

## **Typical Indoor Water Use and Plumbing Code Changes**

The American Water Works Association's Research Foundation performed a comprehensive analysis of indoor water usage for its 1999 published report. The report breaks down typical indoor water use as follows:

- Toilets – 27%
- Clothes Washers – 22%
- Showers and Baths – 19%
- Faucets – 16%
- Other Domestic – 2%
- Dishwashers – 1%
- Leaks – 13%

The Energy Policy Act of 1992 mandated that beginning in 1994, common flush toilets would have to be designed to use a maximum of 1.6 gallons per flush. Additionally, in 1997 new legislation established standards for residential dishwashers and clothes washing machines effective in 2010 and 2011, respectively. Studies have determined that, on average, washing machines last approximately 14 years, meaning that every year 7% of older machines are replaced with more efficient models.

## **Water Conservation Retrofit Kits**

Recognizing the importance of indoor water use efficiency and the need to educate the community, the City began offering free water conservation retrofit kits to residential customers in 2006. This program proved to be quite successful with over 1,750 customers participating. The kits included low-flow faucet aerators, a low-flow showerhead, a toilet tank bladder to reduce water usage per flush in higher flow toilets, leak detection tablets and other water saving information.

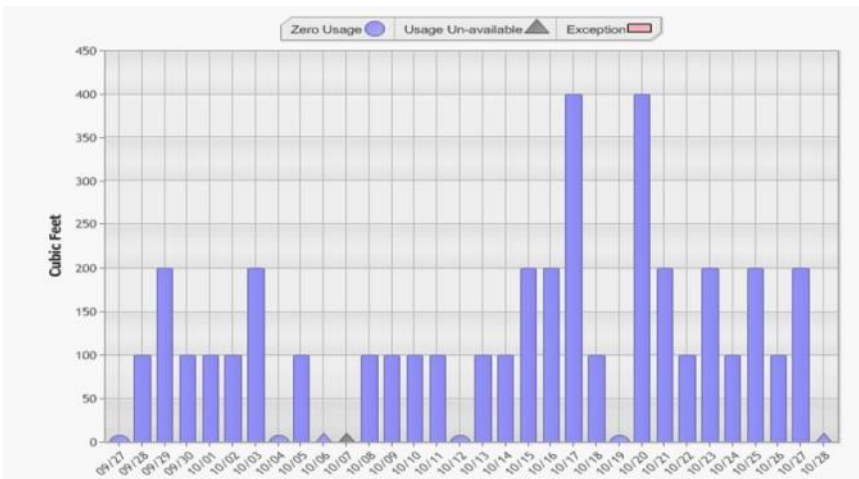
## **Inclining Block Rates**

Following recommendations from its 2006 Water and Sewer Rate Study, the City implemented inclining block rates. Customers using over 7,500 gallons/month are charged 20% more for water and 10% more for

sewer. This generally effects only the larger commercial and industrial customers in the system. Analysis from 2012 confirmed that 82.6% of water bills were billed for usage in the first tier.

### Automatic Meter Reading System and Monthly Billing

The City embarked on a water meter reading system upgrade in 2008. By 2010 nearly all of the system’s customer meters had been upgraded to a fixed automatic radio read system (AMR) that gives the water system staff the ability to monitor daily consumption. This upgrade also made it easier for the City to go from billing customers every four months (three times a year) to monthly. Therefore, customers are now able to better monitor their usage patterns and respond to potential leaks or inefficient water use. The following graphic shows daily water usage for the City’s Department of Public Works and shows how it effectively identifies daily water usage patterns:



### Rain Barrel Program

The City’s next outreach effort included offering rain barrels to qualifying residents at a reduced cost to engage residents in considering storm-water effects and source water protection. From 2010 to 2011, over 600 barrels were sold to Portsmouth residents, who have in return encouraged others to participate in irrigating lawns and flower gardens, while saving on water bills and reducing stormwater runoff.

## **WaterSense Utility Partner**

In 2013 the Portsmouth Water Division became a Utility Partner in the EPA's WaterSense program. The WaterSense program aims to decrease indoor and outdoor water use through water-efficient products and simple water-saving practices. The program encourages customers to look for WaterSense labeled products, which have been independently certified for efficiency and performance, and promotes water-saving techniques that reduce stress on water systems and the environment. WaterSense labeled products must meet EPA's criteria for efficiency and performance. Independently tested and certified products bear the WaterSense label, which makes it easy for consumers to identify and select a variety of quality, water-efficient products and services for their homes and lawns.

## **Leak Detection Program and SCADA System Trends**

Leak detection is a vital component of the maintenance program for the more than 190 miles of transmission and distribution pipelines in the water system. A comprehensive program was undertaken by Portsmouth in 2014 to improve the process of pinpointing existing and potential leaks. This initiative surveyed areas including Newington, New Castle and various areas of southern Portsmouth, resulting in repairs and improvements in multiple problem areas. Additionally, the entire Pease portion of the water system was surveyed with money from a New Hampshire DES leak detection grant. Thirty-three miles were surveyed and two small leaks were identified and fixed along with one service line leak. Leaks are now tracked in the City's electronic asset management database, where the information is utilized by City staff to assess, justify and schedule capital replacements.

The water system is managed around the clock by a staff of state-certified water system operators. Continuous monitoring of the system is also provided by a computer SCADA system and remote station control communications via radio, where pumpage and water tank level trends are routinely analyzed to identify any patterns that show excessive water demand trends. Daily, monthly, and annual pumpage trends are also tracked and compared with water sales to determine the level of water loss in the system over time.

## Actual Water Use – Ten Year Trend

The current New Hampshire Department of Environmental Service's (NHDES) septic regulations for a private residence dwelling uses a basis of 300 gallons per day as an average usage (NH Env-Wq 1008.02(c)). The City of Portsmouth has performed detailed analysis of its own residential (including multi-family residences) water use as part of its water system master planning process. The most recent 2012 analysis of water compared usage to a previous analysis done by the City in 1999. The data revealed that average daily residential water consumption had dropped from 217 to 199 gallons per day, a decline of 8.3%. The 2012 analysis further identified water usage for single family homes to be 133 gallons per day.

## The Next Phase of Water Efficiency – Rebate Program



**Residential Toilet and Washing Machine Rebate Program**

The City's latest water efficiency effort will be directed at the numerous older properties in Portsmouth that likely have less efficient appliances and toilets. Through this program, qualifying residential water and sewer customers are being offered rebates for installing high efficiency toilets and washing machines. This program was approved as part of the Water and Sewer Enterprise Fund's FY15 Capital Improvement Plan, in which \$75,000 was authorized from each fund for a total of \$150,000 dedicated to this program.

The rebates are \$100 for qualifying toilets and \$150 for qualifying washing machines. Customers will have to provide documentation and receipts of their purchases and will also have to agree that they will allow

City staff to inspect the installations. It is the City's intent to audit a few customers periodically to verify these installations.

Qualifying low flow toilets are ones that are certified to use an average of 1.28 gallons of water per flush and have passed rigorous testing standards. Older model toilets use anywhere from 3.5 to 8 gallons of water per flush. Qualifying high-efficiency washing machines use 15 gallons of water per load versus 23 to 40 gallons per load for older, less efficient machines.

This program will be offered to all residential customers served by the Portsmouth Water and Sewer Divisions, including multi-family residences. The program is modeled after those in place at a number of other New England water systems, most notably the Acton Water District in Acton, Massachusetts. It is our understanding that Portsmouth will be the first water system in New Hampshire to offer rebates of this nature.

## **Reduction in Water Use and Rate Model Adjustments**

Most water systems rely on metered customer water usage for customer billing. The Portsmouth Water Division's rates are also highly dependent on metered water use for billing, with the fixed monthly base rates covering only eight percent of the revenue requirement. Therefore, there is a legitimate concern that water usage reductions will result in a reduction in revenues, thus, a need for rate increases to make up for the difference. However, water efficiency measures generally happen over time and if water systems are diligent with monitoring use, then rates can be adjusted to assure revenue requirements are met.

The City of Portsmouth developed a thorough rate model as part of its 2012 Water and Sewer Rate Study. This model enables City staff to input budget expenses and project future water operational and capital improvement costs, and measure customer water usage on an annual basis. Projected water demand increases or reductions for future years are also incorporated in the model, which is set up to create a pro-forma budget for the water system over a ten year period of time. This tool is utilized annually by City Staff to determine that rates are set appropriately and also to project future budget needs and water usage trends.

With that said, it is a legitimate question to ask water systems why they would invest money to reduce consumption if it will end up reducing revenues. The answer is that in actuality, water efficiency investments are less expensive than locating, permitting, constructing and treating a new source of supply. Additionally, these are one-time investments that do not incur ongoing operating and maintenance costs. These conservation initiatives also provide opportunities for the Portsmouth Water Division and its customers to build a partnership that ultimately improves the overall environment of the community.



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