



Pittsburgh Water and Sewer Authority 2012 Executive Report



PEER
PERFORMANCE
SOLUTIONS

PURPOSE OF THE REPORT

In July 2012, the Pittsburgh Water and Sewer Authority (PWSA) launched an innovative partnership with Veolia Water to reinvigorate PWSA's governance, financial and technical abilities to meet its pressing needs and financial constraints.

This report presents the Study findings and opportunities across 10 functional areas as well as early successes and transformations already underway at PWSA to enhance service levels to customers while streamlining operations and reducing costs. This report also recognizes the time and resources from PWSA staff, whose contributions and insights made this Study possible.



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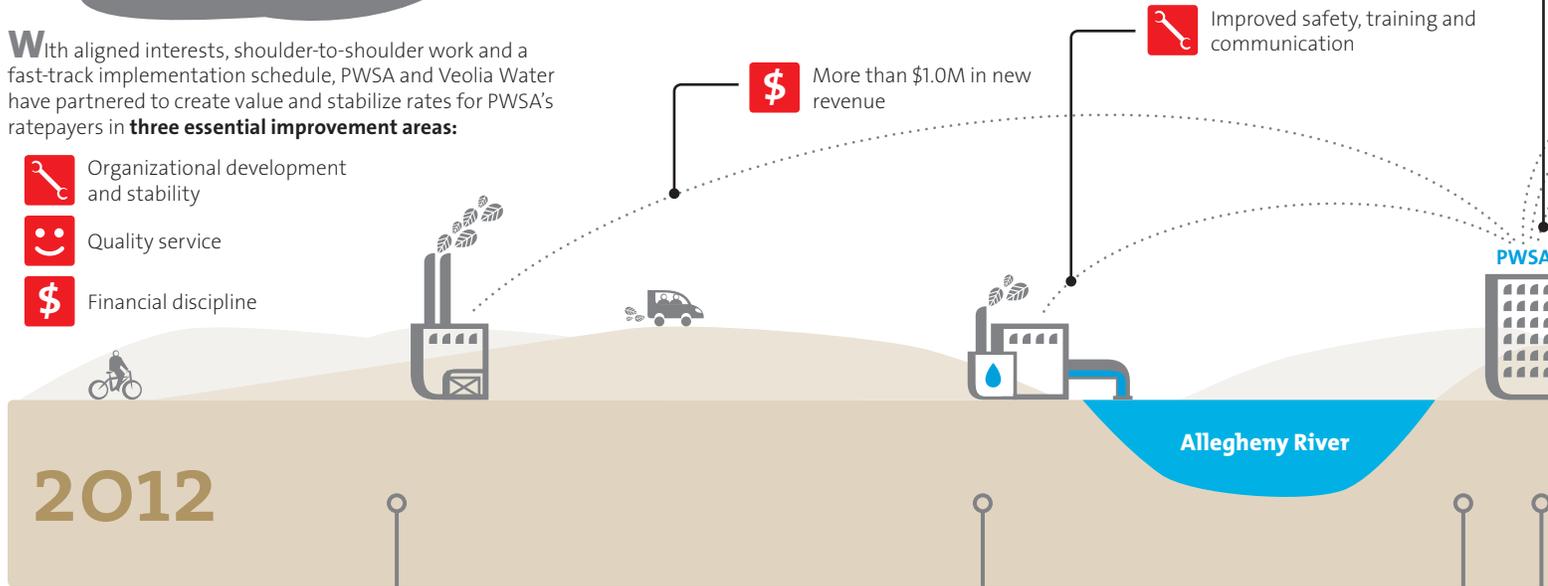
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Benefits are adding up in this innovative partnership aimed at driving organizational transformation and

In serving the needs of its more than 300,000 consumers in Pittsburgh and surrounding areas, PWSA faces a number of **challenges** from the weak economy, aging infrastructure, new environmental regulations and rising costs.

With aligned interests, shoulder-to-shoulder work and a fast-track implementation schedule, PWSA and Veolia Water have partnered to create value and stabilize rates for PWSA's ratepayers in **three essential improvement areas**:

-  Organizational development and stability
-  Quality service
-  Financial discipline



Help sought and found

In July 2012, following a national competition, PWSA hired Veolia Water to provide interim management of the utility for a one-year term with a six-month renewal option. The scope of services includes: (1) executive management oversight; (2) a six-month fast-track diagnostic evaluation of 10 functional areas (the Study); and (3) expedited implementation of recommendations in the form of operational improvement initiatives (known as Key Performance Indicators) and monetary efficiency initiatives (known as Opex Initiatives) as approved by PWSA. Veolia Water provides similar programs to New York City and Winnipeg—as well as operating services for nearly 550 North American communities.

Peer Performance Solutions

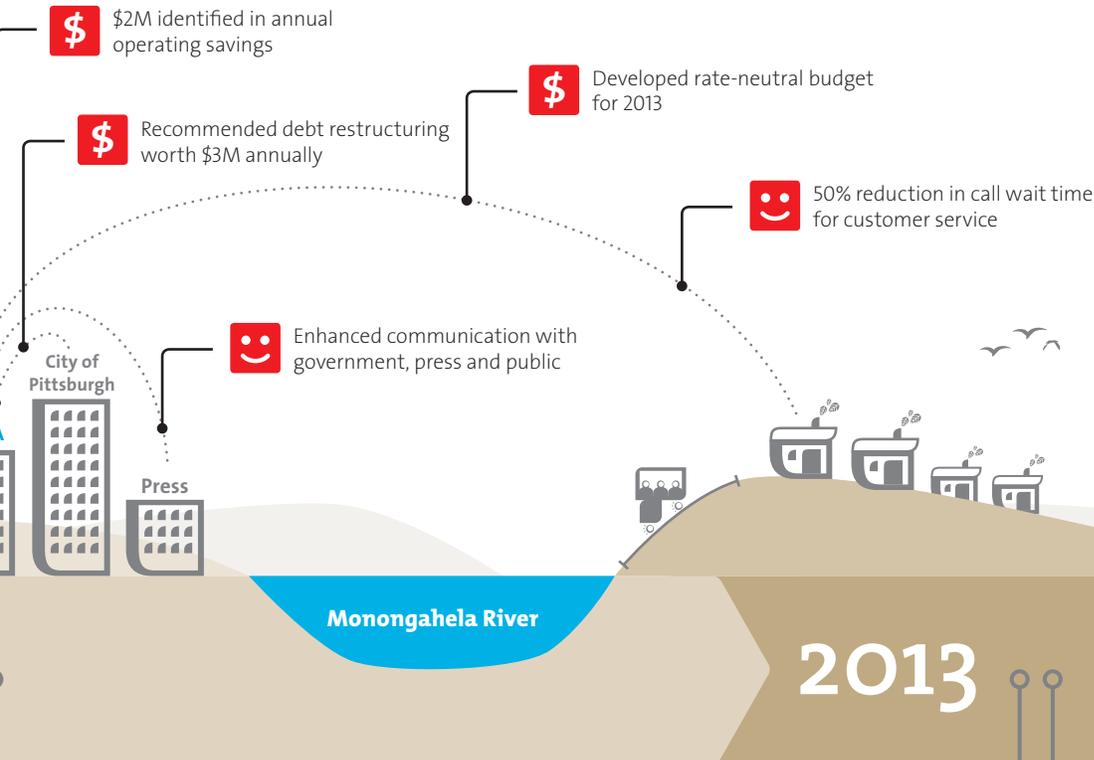
This partnership is based on Veolia Water's Peer Performance Solutions (PPS) model, which is a unique and collaborative partnership focused on sustainable improvements of service delivery to PWSA's customers and stabilizing rates by improving PWSA's financial bottom line with annually recurring cost savings. Governance of this partnership is provided by a Steering Committee, which consists of three PWSA Board members and two Veolia Water executives. Veolia Water is continually infusing industry best practices through its network of North American and European experts and is closely working with PWSA leadership to document institutional knowledge within PWSA.

A utility-wide assessment

To perform the Study, the Veolia Water team worked alongside PWSA peers on the 23 Study objectives under the scope of services, which were categorized into the following 10 functional areas. Each area plays a key role in PWSA's service level to its customers, its fiscal health and its image in the community:

1. Asset management
2. Community outreach
3. Customer service
4. Engineering
5. Finance
6. Information systems
7. Operations
8. Personnel and staffing
9. Water quality
10. Wet weather

Partnership with Veolia Water, Operational efficiencies



This project is creating a map showing the next steps in improving the utility for both 2013 and beyond:

-  Proven programs to ensure quality water, safety and management
-  A publicly published, metric-based appraisal of performance
-  Priorities for 2013 and beyond

Guiding principles

Both PWSA and Veolia Water agree that substantial operational and revenue transformations are needed to offset the pressures for rate increases from urgent infrastructure and compliance needs. Both parties are also firmly committed that there will be no cost-saving layoffs at PWSA. **Every dollar that the PWSA-Veolia Water team saves through efficiencies or identifies in new revenue means another dollar to manage PWSA's debt portfolio or make capital investments in aging infrastructure without tapping ratepayers for additional funds.** Ultimately, through these organizational transformations and efficiencies PWSA is seeking to be a recognized regional leader in water and wastewater service.

Heading toward a more self-sufficient and secure future

Six months into implementing the PPS model, PWSA is leveraging Veolia Water's interim executive management services and consulting services to strengthen its self-sufficiency, positioning for the future in three essential areas:

- 1. Organizational development and stability** through Veolia Water's interim management services and infusion of best-practices.
- 2. Quality service** from joint implementation of operational improvements across the board.
- 3. Financial discipline** through budgeting and cost monitoring at department level.

Early successes build momentum and boost morale at PWSA

Short-term results in organizational development and stability, quality service and financial discipline have been quick and obvious to the public and press, with many applauding the rate stabilization for 2013 and great improvements in responsiveness in customer service. Longer term efforts are underway to dramatically improve performance across the utility, while prioritizing managerial oversight on performance metrics to sustain a lasting transformation. As a result of Veolia Water's Study and discussions with staff and the Board, a short and long-term plan has been created to map out continued success for 2013 and beyond.

Responding to challenges common to large municipal water utilities, PWSA hired Veolia Water for interim management services and a wide-ranging study of Authority operations. Veolia Water examined facilities across Pittsburgh, including the Howard Street Yard and its equipment, such as the vector truck pictured here.



A partnership to create more value for ratepayers

What caused the need for this partnership?

PWSA faced challenges that are all too common in the global economic downturn. As market stagnation continues, ratepayers are becoming more sensitive to rate increases. Despite the pressure to keep rates low, existing utility infrastructure is at the end of its useful life and is failing more frequently, requiring costly emergency repairs. Additionally, inflation is increasing operating costs as the price of chemicals rises in relation to the devaluing dollar. On top of all

of that, more stringent environmental regulations are being enforced, which often require new construction to meet treatment and discharge requirements.

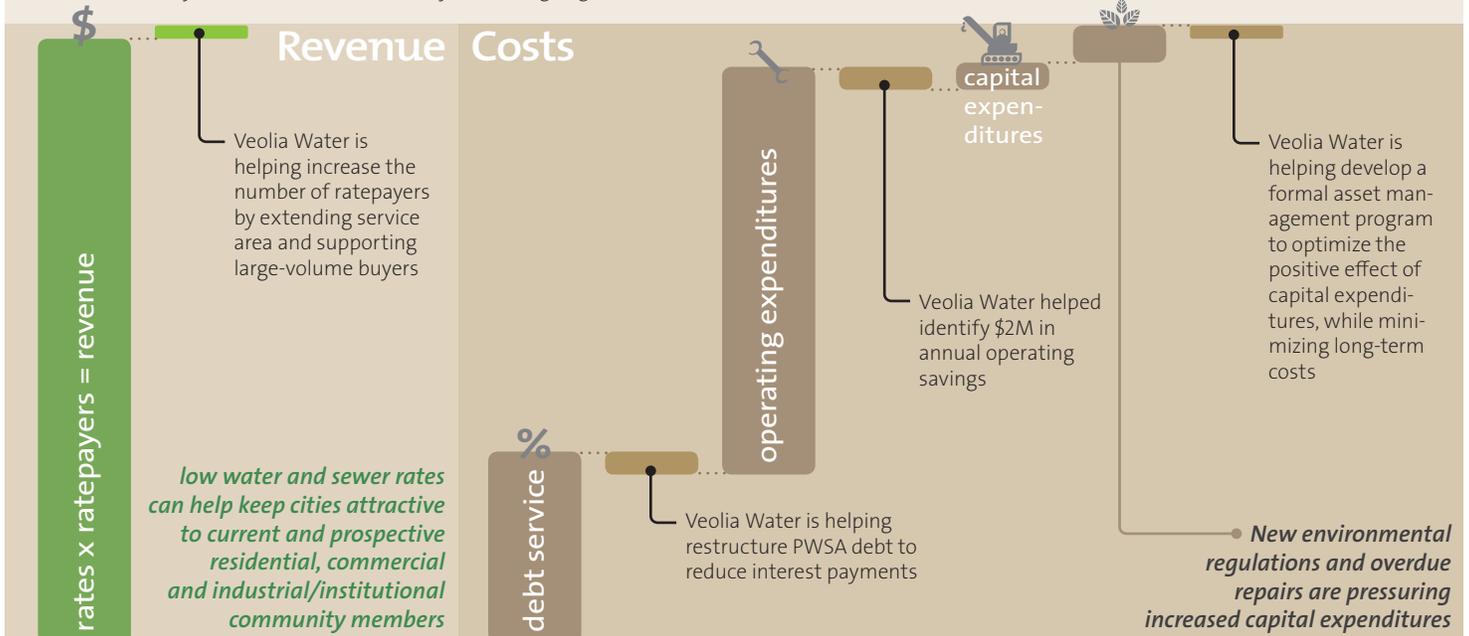
These pressures are leading water utilities across the country to seek innovative solutions that provide not just short-term benefits, but also sustainable improvements that will minimize the financial impacts to ratepayers over the long term, while addressing capital improvement and inflationary cost drivers.

PWSA finds a peer in Veolia Water

To thoroughly address these challenges, the PWSA Board, following a national competition, hired Veolia Water in an Interim Management Services Agreement, signed on July 9, 2012. As depicted in Figure 2-1, below, PWSA has tapped Veolia Water's services to balance pressures between revenue and cost as well as to create more value for stakeholders throughout the utility. As this partnership has progressed, PWSA has benefited from Veolia Water's unique perspec-

Figure 2-1. Revenue vs. cost: Reducing pressure to increase rates that pay for rapidly growing cost drivers

Together, PWSA and Veolia Water are working to reduce expenditure increases with the understanding that maintaining low rates helps Pittsburgh remain one of the country's most attractive cities for job-creating large businesses and industries.



tive and insights as the global leader in water services and water treatment. PWSA and Veolia Water are peers in that both face similar challenges in providing customers with water utility services.

Additionally, through operating over 8,500 water and wastewater treatment facilities worldwide, Veolia Water has developed best practices in all aspects of utility services and responsibilities. This combination of peer understanding and performance expertise makes Veolia Water an exceptionally valuable partner to help PWSA face its challenges and transform itself into one of the strongest publicly operated utilities in the region.

Veolia Water’s unique approach: Peer Performance Solutions

The PPS model is a unique and collaborative partnership focused on sustaining improvements long after the collaboration is completed. Under PPS, public utilities gain access to Veolia Water experts, who work side-by-side with their public counterparts to improve the utility. These collaborations blend the local knowledge of the public employees with global best practices to identify, evaluate and implement improvement ideas. Figure 2-2 illustrates the delivery model for the interim executive management services as well as the concurrently running PPS.

These services have been delivered by the integrated team depicted in Figure 2-3, right. This organizational structure features a joint steering committee that reviews progress, makes decisions and mandates actions.

Additionally featured are Veolia Water’s interim managers, with James Good serving as Executive Director, Joey Tolbert serving as Finance Director, Doug Amos serving as Chief Operations Officer, and Gerry Ludwig serving as Director of Engineering and Construction. Finally, the PPS project management office integrates into the organization to manage the work of the technical experts, track and publish project progress reports and coordinate the development of this Study Report.

Figure 2-2. Project delivery approach, timeline and key features

1. INTERIM EXECUTIVE MANAGEMENT SERVICES



2. DIAGNOSTIC EVALUATION (LARGE TEAM)

3. IMPLEMENTATION TARGETING MAXIMIZED SAVINGS



Figure 2-3. The organizational structure of the interim management services and PPS team integration



About PWSA

Under the Pennsylvania Municipality Authorities Act of 1945, PWSA was created as a municipal authority to oversee a \$200 million capital improvement project for the city of Pittsburgh's water system. Prior to 1984, the city's Water and Public Works Departments managed Pittsburgh's water and sewer systems. Under a Capital Lease Agreement and Cooperation Agreement effective in 1995, the city water department became part of the Authority.

PWSA is responsible for producing and supplying water and maintaining and operating the city's water infrastructure. PWSA also operates and maintains the city sewerage collection system. PWSA is one of the largest combined water and sewer authority in the Commonwealth of Pennsylvania. It is governed by a seven-member Board of Directors appointed by the Mayor.

PWSA currently serves more than 300,000 people in the City of Pittsburgh and Borough of Millvale. PWSA also sells water to Fox Chapel, Reserve Township, Hampton Township and Aspinwall Borough. It is connected to several other regional water systems. PWSA serves 83,000 drinking water connections and 113,000 sewage service connections.

PWSA has approximately 265 employees and facilities consisting of water treatment and distribution facilities and wastewater collection and transmission facilities (the water and sewer system).

The Allegheny River is the PWSA's sole source of raw water. The Aspinwall Water Treatment Plant produces an average of 70 MGD of drinking water. PWSA's water system also includes a membrane filtration plant with a design capacity of 32 MGD; 1,012 miles of water lines; four reservoirs; 12 storage tanks; and 12 pump stations. The total storage capacity of water reservoirs and tanks throughout the system is approximately 455 million gallons.

PWSA's sewer system is primarily a combined system designed to convey both stormwater and sanitary sewage. The system consists of 1,200 miles of sewer lines and four booster pumping stations to collect and convey wastewater to Allegheny County Sanitary Authority (ALCOSAN) for treatment. The water and sewer system does not include wastewater treatment facilities.

PWSA has recently launched a number of important initiatives, including the migration of its Enterprise Resource Planning (ERP) system to a new platform, the comprehensive inspection of water valves and fire hydrants, the installation of remote monitoring (SCADA) in the system and an inspection of the physical condition of the water plant clearwell.

Last year, PWSA embarked on a very important Stormwater Rate Structure Feasibility Study, which will allow PWSA to evaluate its current practices and coordinate with other government agencies and their future goals related to stormwater management. The objective is to

develop a stormwater rate structure as a way to more equitably cover the costs of stormwater-related actions.

At the end of 2012, PWSA completed a two-year planning process for its 40-year Capital Plan. Additionally, PWSA is currently drafting its Long-Term Control Plan (LTCP) in compliance with the 2004 Consent Order and Agreement (COA) with the Pennsylvania Department of Environmental Protection (PADEP) to reduce combined sewer overflows (CSOs).

An innovative partnership

PWSA experienced a two-year vacancy in the Executive Director position and realized that the skills needed to address its challenges and move the PWSA forward would not be found in one person. This prompted PWSA to issue a Request for Qualifications and Request for Proposals (RFQ/RFP) for an Interim Executive Management Contractor in March 2012. Responsibilities include (1) provide a Study Report assessing and recommending short and long-term strategies for a diverse range of challenges; (2) begin implementing strategies that would reinvigorate PWSA's ability to meet the needs of the more than 300,000 people being served; and (3) provide performance metrics.

Through a competitive public procurement process, the Board unanimously selected **Veolia Water North America** (Veolia Water) for its flexible proposal that offers a

collaborative approach based on trust and mutual respect and that outlines measurable results to PWSA's customers.

The proposed approach included (1) highly skilled executive management (Jim Good, Interim Executive Director, and Doug Amos, Interim Chief Operations Officer); (2) a six-month fast-track diagnostic evaluation of the 23 Study objectives (originally nine months in RFQ/RFP); and (3) expedient implementation of recommendations in the form of improvement initiatives (defined by KPIs—see Appendix B) and monetary-efficiency initiatives (Opex Initiatives) as approved by PWSA.

This partnership is based on Veolia Water's PPS model that is focused on sustainable improvements of service delivery to PWSA's customers and stabilizing costs for ratepayers by improving PWSA's financial bottom line, with anticipated annually recurring cost savings of between \$2–8 million and with zero cost-saving layoffs. In July 2012, PWSA and Veolia Water signed the Interim Executive Management Agreement (Agreement) for a one-year term with a six-month renewal option.

Who is Veolia Water?

Based in Chicago and with over 3,500 employees, Veolia Water is the leading provider of comprehensive water and wastewater partnership services to municipal and industrial customers, providing services to people in nearly 550 North American communities.

Veolia Water is a proven firm with demonstrated experience in transforming small to large-size water and wastewater utilities into best-in-class organizations. The firm has the people and the necessary experience to identify and implement sustainable improvements, working shoulder-to-shoulder with utility staff from the bottom-up. Veolia Water's parent company, Veolia Environnement

(NYSE: VE and Paris Euronext: VIE), is the worldwide reference in environmental services. With more than 315,000 employees globally, Veolia Environnement recorded annual revenues of \$38 billion in 2011. Visit the company's websites at www.veolianorthamerica.com and www.veoliawaterna.com, or on Twitter at www.twitter.com/veoliawaterna.

“Our selection of Veolia Water is aimed at taking PWSA to the next level of utility service...Our agreement is unique in that via a peer-to-peer relationship it leverages Veolia's worldwide knowledge of utility best practices with that of local public-sector knowledge of the Pittsburgh system. The agreement also includes performance-based incentives that will reward Veolia for achieving exceptional results.”

— **PWSA Board Chairman Dan Deasy**

Press release announcing partnership, July 12, 2012

“We look forward to demonstrating how the strong commitment, excellent skills and institutional knowledge of Pittsburgh's public employees can be perfectly blended with our own experts to ensure exceptional service to Pittsburgh residents. Our goal is to deliver a portfolio of best practices through our Peer Performance Solutions partnership model that will include lessons learned from communities like New York City, Tampa Bay Water and Winnipeg, Manitoba.”

— **Veolia Water Americas CEO Laurent Auguste**

Press release announcing partnership, July 12, 2012

Drawing upon the breadth of its experience, Veolia Water is evaluating ways to improve the efficiency of the Highland Park Membrane Plant, pictured below.



Early successes

Partnership achieves early positive results

Six months into implementing the PPS model, PWSA is leveraging Veolia Water’s interim executive management and consulting services to strengthen its capabilities in three essential areas:

 **Organizational development and stability:** Strengthen

PWSA’s ability to manage resources and capital projects.

 **Quality service:** Enhance service delivery and implement operational improvements across the utility.

 **Financial discipline:** Stabilize costs for ratepayers and restructure PWSA’s debt portfolio to minimize principal and interest payments.

Organizational development and stability

 **Making PWSA a better workplace for employees**

From day one, Interim Executive Director Jim Good set out to break down barriers and instill a best water/wastewater utility culture – where

Figure 3-1. Veolia Water commits to investing in PWSA leaders through a structured change-management approach



PWSA staff could take pride in their work with a “let’s fix it” attitude and see their roles as part of a larger mission of service to Pittsburgh.

Veolia Water launched a “PW1SA” campaign, committing to no cost-saving lay-offs and rejuvenating a spirit of working together to address issues throughout the organization. Starting with what many called a first utility-wide gathering, Jim and his team served BBQ to the entire PWSA staff. During the first six months of the partnership, many PWSA staff personally approached Jim to discuss their ideas.

As a part of the campaign, Veolia Water is continually working to help PWSA staff learn new techniques, promote out-of-the-box thinking, understand how to implement new ideas, and increase collaboration between departments to solve complex challenges.

- 30% of staff have been in safety, technical or management training courses over the past six months.
- Staff have quick access to experts in various topics to solve problems— Veolia Water experts work side-by-side with PWSA staff on-site.
- Some PWSA staff traveled to Veolia Water facilities to learn new ideas.
- Management and team meetings are being utilized to improve coordination, discuss problems, share successes and increase labor/management interaction.

The “PW1SA” campaign is designed to make PWSA staff more informed, engaged and in a position to make change happen to improve service, quality and cost control.



Transforming safety culture a day at a time

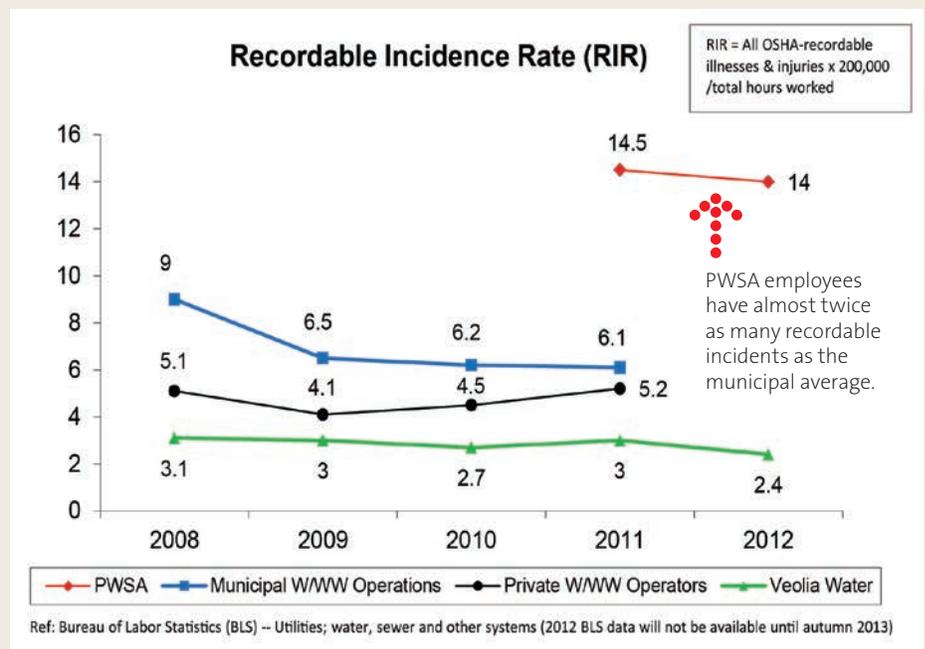
Bringing a fresh set of eyes and a strong safety-performance track record, Veolia Water quickly identified the need for PWSA to make safety a priority. While Veolia Water has 3,500 employees in North America operating and maintaining more than 300 water/wastewater plants, its injury rate is 60% lower than the private-water/wastewater industry standard per hour worked. However, PWSA’s injury

rate is more than twice the municipal-water/wastewater standard per hour worked. In 2012, for every 100 full-time employees, 14 had a recordable injury or illness at PWSA, compared to 2.4 at Veolia. See Figure 3-2, below.

While PWSA is efficient at returning people to work from an injury, as shown in Figure 3-3, next page, PWSA and Veolia Water are working together to reduce the likelihood of injuries in the first place. This requires building a safety culture organization-wide, which is one of Veolia Water’s differentiating strengths in the industry.

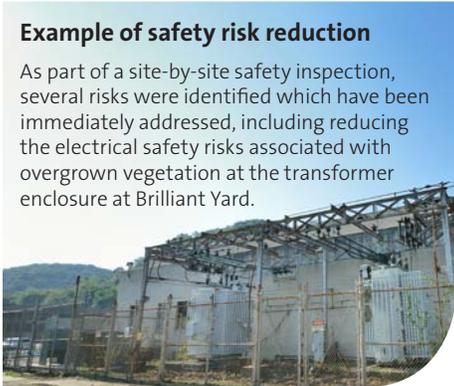
Through this partnership, Veolia Water has provided safety training and exposure for more than one-fifth of PWSA office and field personnel.

Figure 3-2. PWSA’s safety performance in occurrence of recordable incidents is more than double the industry average for municipalities



Feedback collected during Veolia Water’s safety training shows marked transformation in PWSA staff’s mindset—they are beginning to see the importance of safety in their day-to-day work and are expressing gratitude and interest for more safety training.

Though improvements are underway, much work needs to be done on safety!



Example of safety risk reduction

As part of a site-by-site safety inspection, several risks were identified which have been immediately addressed, including reducing the electrical safety risks associated with overgrown vegetation at the transformer enclosure at Brilliant Yard.



Helping set up key information systems

PWSA experienced significant delays in the six-year roll-out of its financial and customer service Enterprise Resource Planning (ERP) system. The ERP system is a critical financial-reporting and data platform for PWSA and its customers, because it tracks revenues, expenditures, customer billing and collections, and meter data. Veolia Water is helping PWSA complete its migration for a timely roll-out by providing oversight and governance—including identifying top issues to be resolved by the IT vendor and restructuring the process to achieve the best value to PWSA for its multi-million-dollar ERP investment.

Quality service



Cutting call wait time for customers by 50%

When Veolia Water arrived, PWSA’s call center was struggling to keep up with incoming calls, and many customers hung up out of frustration from trying to get through to ask even the simplest questions. To address this problem, PWSA was planning to purchase a new phone system.

Through Veolia Water’s expertise in reprogramming the existing phone system with virtually no additional costs, the PPS team not only postponed a full system replacement, it received positive feedback from its customers and constituencies on the improved customer service.

See Figure 3-4, next page. Average wait time dropped almost 50%, from nearly nine minutes last summer to a little less than five minutes in December 2012. Call abandonment rate also decreased by 48%, from 17% last summer to 9% in November 2012. The PPS team continues to work towards improving the response time to industry standard—having 85% of calls answered in two minutes or less.



The recent improvements implemented in the customer service department have not only resulted in favorable reviews from across the city, they have also improved employee morale.

Figure 3-3. Fortunately, most PWSA recordable incidents do not prevent employees from continuing to work

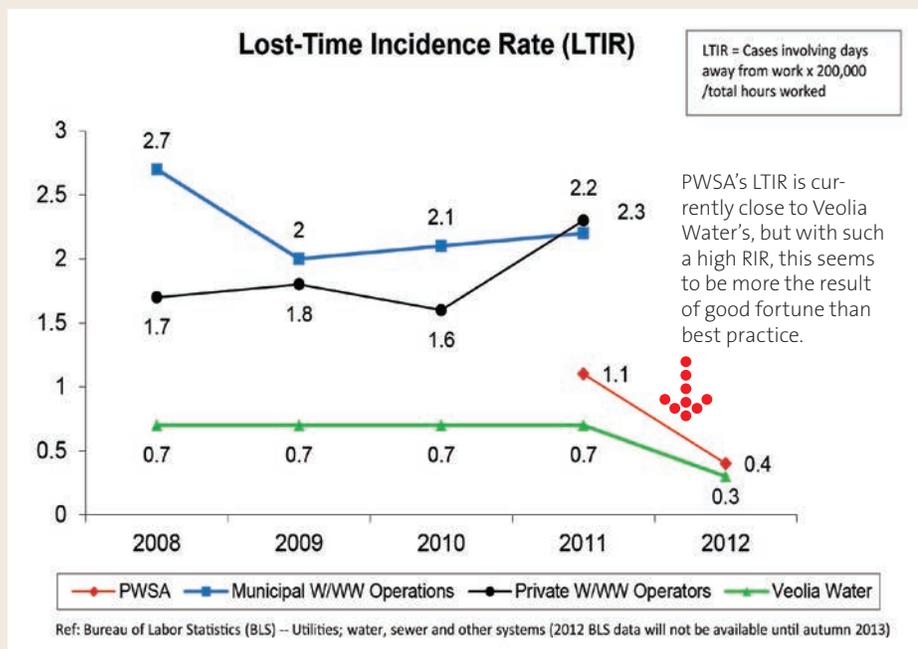
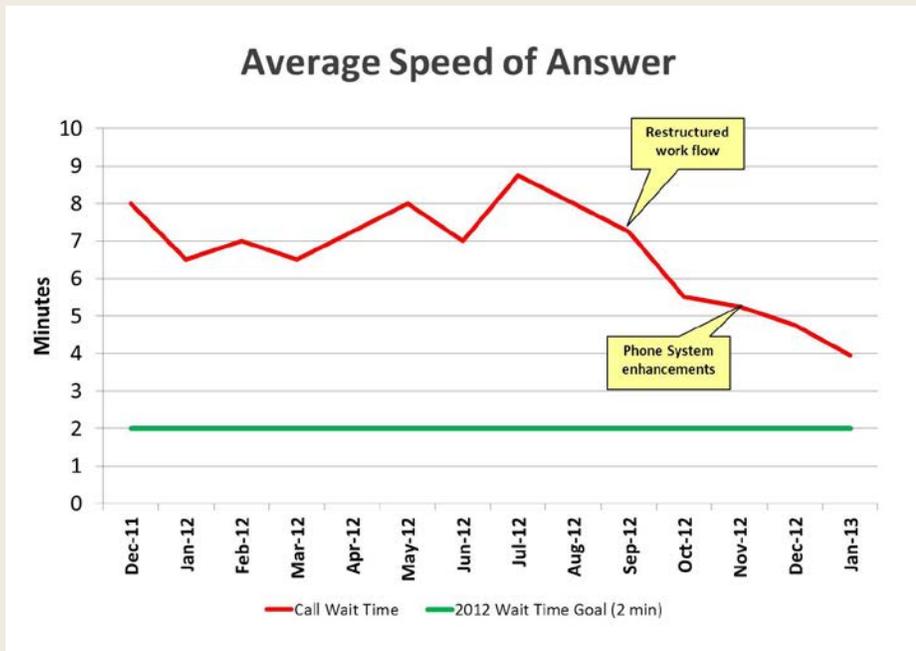


Figure 3-4. Average wait time dropped by almost 50% from 8 minutes to 4.75 minutes by December 2012



“I think the new menu options are wonderful! There are usually 13 callers ahead of me and I was surprised that I got through right away. Love the commitment PWSA has made to improve answer time. It really indicates that you guys do care about your customers’ time.”

– Debra from Duquesne Heights

“I used to have hellish experiences with PWSA. Today the PWSA rep was exceptional. It was a great experience—short wait time and the rep took immediate action to remedy the situation.”

– Francis from Chartiers City

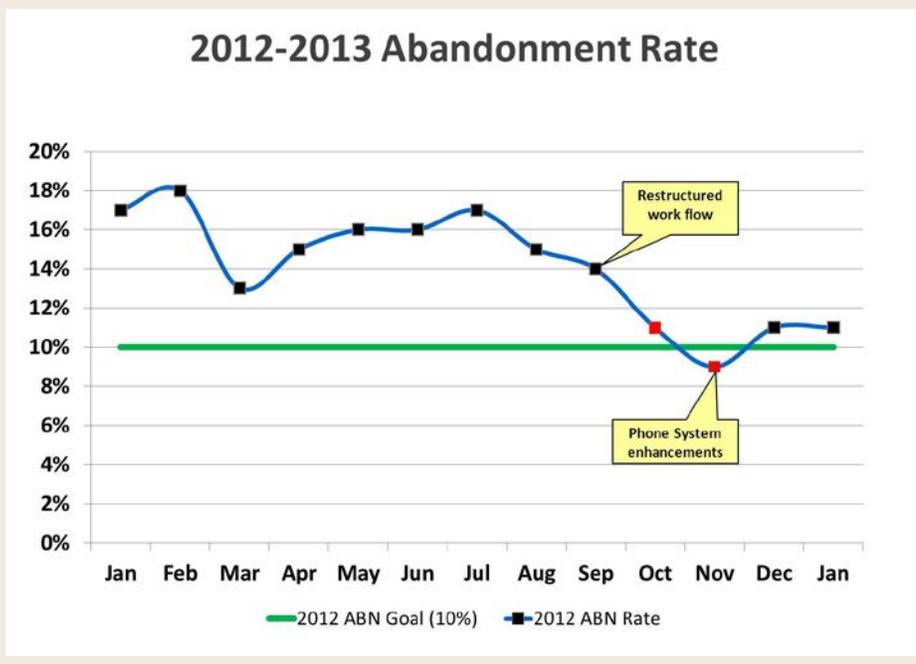


Enhancing communication with government, press and public

By developing a comprehensive Communications Plan that identified clear outreach and communications strategies and tactics, PWSA is now focused and on track to provide updates and outreach to customers, public agencies, media, environmental organizations and other partners on a regular basis.

For example, during October 2012’s Superstorm Sandy, PWSA’s Executive Communications Coordinator maintained constant communication with the media, the mayor’s office, City Council, the PWSA Board, residents and PWSA staff to increase readiness by checking catch basins in and near their homes before the rain. Residents

Figure 3-5. PWSA customer service staff have now helped the call abandonment rate drop below 10% for the first time in six years



were also advised to call PWSA Dispatch for clogged basins (and 911 to report flooding). Internally, PWSA coordinated to have Dispatch adequately staffed to handle excess call volume, while Operations staff preemptively cleaned key catch basins, loaded trucks with extra barricades for emergency street closures, increased staffing to monitor pump stations during a power outage, and topped off reservoirs to minimize service disruptions.

Subject: Hurricane Preps
Date: October 31, 2012

I know you don't always get gratitude from the people you serve, so I thought I would take this opportunity to thank you for all the work that you did to inform us about the steps being taken to prepare the city for the hurricane. The information you provided was very helpful. Also, a big thanks to the PWSA staff who were out there addressing concerns of the residents—thus far, we've had no complaints about flooding!

Thanks again,

Judy Feldman
Chief of Staff
Office of Councilman Corey O'Connor

Subject: Thank You
Date: November 3, 2012

I just wanted to thank you and commend the entire team for what was a great job you all did being proactive with the hurricane. Never saw PWSA so proactive and engaged. It is really appreciated.

Dan Gilman
Chief of Staff
Office of Councilman William Peduto



Building capabilities in managing capital planning

As an owner, PWSA is responsible for capital planning, which involves informed decision-making and keeping in touch with beneficial innovations. As a result of this partnership, PWSA's Engineering Department is improving its capital projects management, with a special focus on improving cost and schedule accountability.

Today, all capital projects have an assigned PWSA Project Manager who is fully accountable and, therefore responsible, for the success of the project during both design and construction phases. This includes cost and schedule management as well as technical management and construction oversight. In addition, PWSA project managers are responsible for the project from start to finish, with no handoffs or switching of responsibilities—from planning and design through project construction and sign off.

Veolia Water has assisted in creating processes to share information and increase in-house oversight of capital projects. For example, project meetings involving the Operations Department, the Engineering Department and the Bond Construction Manager are now held weekly (versus every two months) to ensure timely responses to project issues.



Making PWSA a more inviting place to do business

By generating more interest in PWSA solicitations for bids and proposals, competition is likely to increase and pricing to improve over time. By re-examining current procurement practices, Veolia Water assisted the PWSA's Engineering and Construction Department to:

- **Pay on time**—promptly paying contractors who perform in accordance with agreed-upon terms.
- **Remove roadblocks**—allowing contractors to purchase their own materials, empowering contractors to complete work on schedule.
- **Respect contractors' time**—eliminating non-essential pre-bid meetings which were previously mandatory.
- **Reduce contractors' risk**—developing clearer project scopes of work, removing subjectivity from completion assessments which helps contractors bid competitively and manage work profitably.

Financial discipline



Securing more than \$1.0M in new revenue

This new revenue is critical in closing the 2013 revenue gap and is achieved



CITY OF PITTSBURGH

"AMERICA'S MOST LIVABLE CITY"

Office of Mayor Luke Ravenstahl

August 20, 2012

The Honorable Daniel Deasy
Chairman
Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, PA 15222

Dear Chairman Deasy:

As you are well aware from your role as Chairman of the PWSA, virtually every community in the greater Pittsburgh region will be submitting plans for the reduction of combined sewer overflows (CSOs) to either the Pennsylvania Department of Environmental Protection (DEP) - in the case of the PWSA and many Pittsburgh suburbs - or the U.S. Environmental Protection Agency (in the case of ALCOSAN). While the ultimate extent and cost of these plans will not be known until they gain final approval from the relevant agency, all parties agree that steps must be taken to reduce CSOs in order to protect the environment, public health and the quality of life we enjoy in Pittsburgh.

It is this latter item that has contributed so much to Pittsburgh being ranked again and again over the last few years as one of the world's most livable cities. A key aspect of this desirability has been the City's embrace of green policies. Therefore, I was somewhat disappointed, as were many others, that the plan recently released by ALCOSAN to address CSOs had so little to say about the implementation of "green" infrastructure to help reduce wet weather flows. With PWSA's Long Term Compliance Plan (LTCP) for the reduction of CSOs not due for submittal to DEP until July 2013, this provides Pittsburgh and the PWSA with sufficient time and a great opportunity to ensure the LTCP incorporates green infrastructure and approaches to the extent feasible. Not only is this the right thing to do, but it will also serve to showcase Pittsburgh's leadership role as the region's "green" leader.

Therefore, I respectfully request that you direct the PWSA to ensure that all appropriate steps are taken by Authority staff to ensure the version of its LTCP submitted to DEP fully consider, and where appropriate, maximize the use of, green technologies, practices and policies that will contribute to the reduction of wet weather flows into the combined sewer system. How you implement this request is, of course, up to you and the Board. However, I would point out that the City is home to numerous entities with great expertise in this area that are eager to assist PWSA in such an effort and that stakeholder buy-in is critical to the acceptance and success of the final plan approved by DEP. I am also requesting that PWSA include the Department of City Planning on its efforts in this regard to ensure that issues within its jurisdiction are considered and incorporated as appropriate.

Thank you for your attention to this matter. I will make staff from the relevant City agencies available to assist in this effort as needed at your request.

Sincerely,

Luke Ravenstahl
Mayor, City of Pittsburgh

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Supporting the push for "green" infrastructure to help the environment

Along with 82 other communities in the area, PWSA is under a consent order to submit a long-term control plan for the reduction of wet weather combined sewer overflows (LTCP). Traditionally, the approach to reducing CSOs has been to rely exclusively on building new or expanding existing conveyance tunnels and treatment plants. Now, more and more communities are looking at incorporating green infrastructure (GI), like stormwater swales and pervious pavement, into their plans to reduce CSOs.

Working with the Mayor's office, PWSA and Veolia Water sought ways to ensure PWSA's LTCP thoroughly evaluated and, where appropriate, maximized the use of, green technologies, practices and policies that will contribute to the reduction of wet weather flows into the combined sewer system. This is being done through a series of three charettes, or planning meetings, attended by GI technology, planning and policy experts, not only from the Pittsburgh-area, but around the country and several from overseas.

Demonstrating the importance the broader community places in this effort, through Veolia Water's outreach efforts, funding from four Pittsburgh-based charitable foundations was secured—without which this process would not have been possible.

by winning back PWSA's single-largest customer (\$1M/year) and collecting fire service line revenue (\$300k/year). PWSA's 2012 revenue dropped substantially, partly due to the loss of \$4 million from a single commercial customer that found that building and operating 17 wells could furnish most if its water supply at marginally lower cost.

Understanding a utility's responsibility to keep small and large customers happy, Veolia Water worked with PWSA to bring the customer back through

enhanced value offerings. This effort has already produced an agreement from the customer to accept PWSA's service, on a trial basis, at reduced water quantities. This success not only reduces revenue pressures on other ratepayers, but it also supports a private-sector firm employing 400 staff. Additionally, inquiries made to PWSA's finance and rate staff revealed that authorized fire-service-line water fees were not being invoiced. The Board had approved the fee in 2006, which equated

to \$1.8 million in lost revenue over the past six years.

Veolia Water assisted PWSA in fully enacting the fire-service-line water fees, including sending out notices to impacted customers. About 95% of the impacted customers are being charged \$21 per line per month since January 1, 2013.

Recent examples of on-time performance include:

- Completion of PWSA consultant's Stormwater Rate Structure

Feasibility Study which had previously languished for months.

- Expedited contracting for PWSA consultant to finalize the Long-Term Control Plan (LTCP).



Identified \$2M in annual operating savings

Veolia Water has identified \$2M in annual operating savings through a combination of operational strategies that include reducing electrical and chemical usage; improving accuracy of meters on large customer lines; bringing maintenance of the distribution and collection systems in-house; improving the technology and cost-effectiveness of the advanced-metering reading system; and analyzing fleet effectiveness.

Such operational strategies are currently categorized as Opex Initiatives that are under evaluation or proceeding to pilot stage. An audit by an independent accounting firm will be conducted to verify the actual annual operating savings to PWSA.



Recommended debt restructuring worth \$3M annually

Veolia Water, through the Interim Financial Director, is assisting with refinancing PWSA's outstanding debt and managing the debt portfolio. PWSA has a complex \$720 million debt structure. Veolia Water engaged a

prominent financial expert to provide debt-restructuring advisory services and is working closely with PWSA Bond Counsel to work through indentures and covenants to provide more cost-effective options in securing future long-term borrowing. In 2013, Veolia Water anticipates that PWSA will realize savings of at least \$3 million from restructuring about \$100 million of its debt.



Developed rate-neutral budget for 2013

2013 will be the first time in four years that PWSA's approved budget has not included a rate increase. The 2012 budget included a 4% rate increase. The 2011 budget included a 7.7% rate increase plus a 2% increase in a 2010 fee that generates money for infrastructure improvements.

Under the leadership of Veolia Water's Interim Finance Director, the Board approved a 2013 operating budget that projected about \$151 million in revenues and \$146.9 million in spending. The new spending budget is a 9% reduction from what was spent in 2012 (\$161.6 million). Revenue enhancements and reduced operating budget made this possible. Revenue enhancements for 2013 include at least \$3 million to be realized from large-customer win-back, debt restructuring and fire-service-line water fees.

The average residential customer will continue to pay about \$54.05 a month—

with an approximate breakdown of \$36.70 for water consumption, \$13.80 for wastewater handling and \$3.55 for infrastructure development.

Intangible benefits

As a true partner, Veolia Water invests in the PPS partnership by offering additional benefits without any charge to PWSA:

- Labor and expenses for filling the Interim Finance Director position for the past four months.
- Travel expenses for Interim Engineering Director.
- Sponsorship of technical and management training by well-renowned expert Paul Levy and global management consulting firm McKinsey & Company.
- Provision of opportunities for two PWSA staff to visit Veolia Water showcase facilities in Ohio as real-life references of safety excellence.
- Sponsorship of a trip for one PWSA staff to visit a Michigan utility to see an efficient inbound call center model first-hand.



As part of implementation, efficiency improvements will be modeled at a particular facility, such as the water plant's main high service pump station, pictured below, and then rolled out to similar facilities across Pittsburgh.



Transformations across PWSA

Findings and opportunities

The PPS model requires a collaborative approach that combines organizational transformation via change management with identifying and implementing efficiencies throughout PWSA operations. See Figure 5-1, below.

The findings and recommendations for each functional area are as further described.

Administration

1. Customer service
2. Finance

3. Personnel and staffing
4. Information systems
5. Community outreach

Engineering & Construction

6. Engineering
7. Asset management

Operations

8. Operations
9. Water quality
10. Wet weather



Figure 5-1. Ongoing transformations and the path forward for the PWSA and Veolia Water partnership



1. CUSTOMER SERVICE

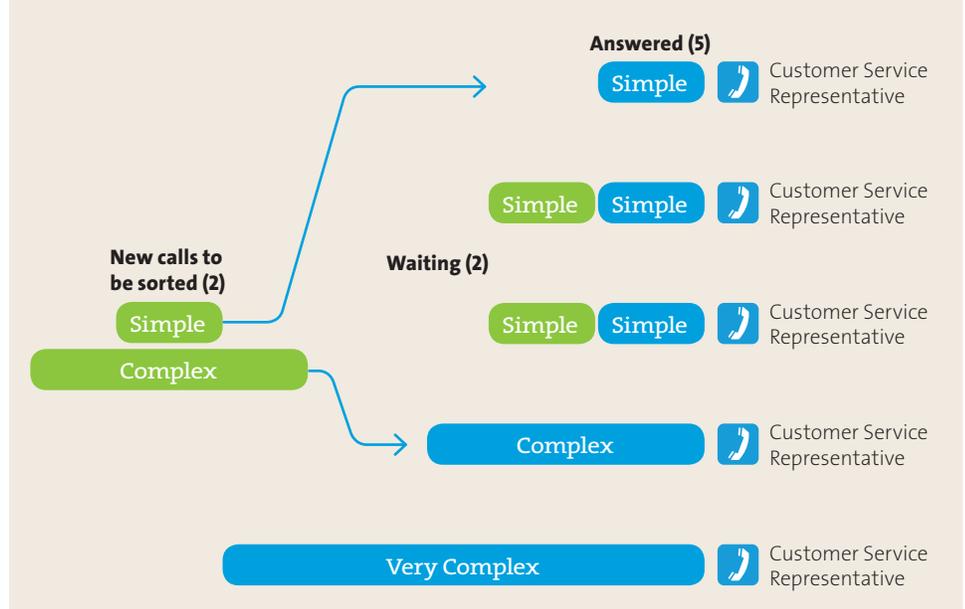
Customer satisfaction is an important measure of PWSA's service level. With a staff of approximately 40, the Customer Service Department is the hub for all customer service functions. The functions performed include bill generation, account setup, service dispatch, dispute resolution and the like. The call center handles approximately 500-600 inbound calls per day, representing a significant portion of the customer base.

Best-in-class call centers closely track KPIs to analyze trends and manage performance to improve the customer experience. By leveraging technical innovation and best-in-class processes and procedures, PWSA's customer service operations can be empowered to develop a more positive environment with a workforce committed to the organization's values.

OPPORTUNITIES INCLUDE:

- a) Modify call routing to separate incoming calls by customer issue types and expected resolution times, reducing waits for customers having simple-to-answer questions. This requires reprogramming the logic of existing phone system. See Figure 5-2, above.
- b) Activate inbound phone statistics tracking in the call center application to enable performance management through key metrics, such as call abandonment rate and hold times.

Figure 5-2. Incoming calls can be sorted to reduce hold times for the majority of customers having simple-to-answer questions



- c) Improve cooperation and coordination between the Billing, Inbound Contact Center and Collections departments by implementing cross-cutting KPIs, tracking performance as one team, with frequently shared updates and messaging.

2. FINANCE

Rate stabilization and managing its debt portfolio are among the most critical priorities of PWSA in the coming years. Organization-wide, PWSA will need to strengthen its financial functions, discipline and governance through organizational change. To do so, PWSA needs to be equipped with the right capacity and capabilities in

people, culture and tools—including a wide range of financial metrics. These financial metrics must balance competing demands for rate increases and city-of-choice rate deals for large-volume water users.

OPPORTUNITIES INCLUDE:

- a) Establish a bottom-up budgeting and feedback process to share responsibility across the PWSA organization, increase accountability for budgets and spending at the department level and identify expense/revenue gaps. A feedback loop can be created by initiating monthly budget reviews and distributing detailed monthly financial reports to each department for ongoing engagement and discussions among department heads and the Finance Department.

b) Reduce operating costs.

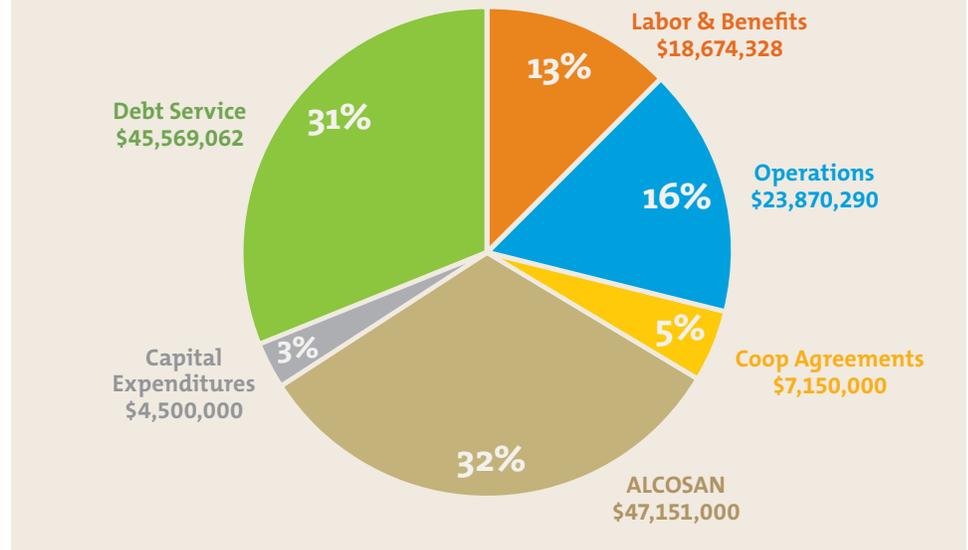
- Establish and implement a cost-reduction campaign targeted at Operations and Capital Expenditures. Figure C-3, right, shows a breakdown of the 2013 operating budget, which consists predominantly of cost categories with limited cost-saving opportunities (e.g. pass through costs to ALCOSAN, labor and benefits, and Coop Agreement transfer payments.).
- Review and reduce third-party contracts, if appropriate, to improve PWSA's finances.

» In 2011, PWSA paid \$39.5M to Top 29 vendors with contract amounts over \$500,000. Services include administrative, engineering and construction, and operations. See Figure 5-4, next page. This represents an opportunity to review procurement policies and determine if benefits can be realized by assigning some of this work to in-house staff.

- Match production with water consumption. Minimize wastage and unaccounted-for water in order to reduce costs.

» Basic daily water production, consumption and storage data indicate that PWSA produces significantly more water than it provides to revenue-producing customers. Given the variable costs, such as power and chemicals, and fixed costs, such as labor and overhead, expended to produce potable water, producing more water than

Figure 5-3. The approved 2013 budget projects total operating expenses of \$147M, as broken out below—9% lower than budgeted in 2012



is sold is much like tossing money down the drain. Review, build upon and implement measures based on the Water System Audit by PWSA's consulting engineer.

» Some obvious sources of water-meter-revenue loss have been identified (e.g., the Bruecken Pump Station). Much preparatory work must be undertaken before the volume of unaccounted-for water can be reduced. For instance, new valves must be installed so that flow can be redirected without interrupting service to existing customers while repair work is performed.

c) Investigate revenue enhancements.

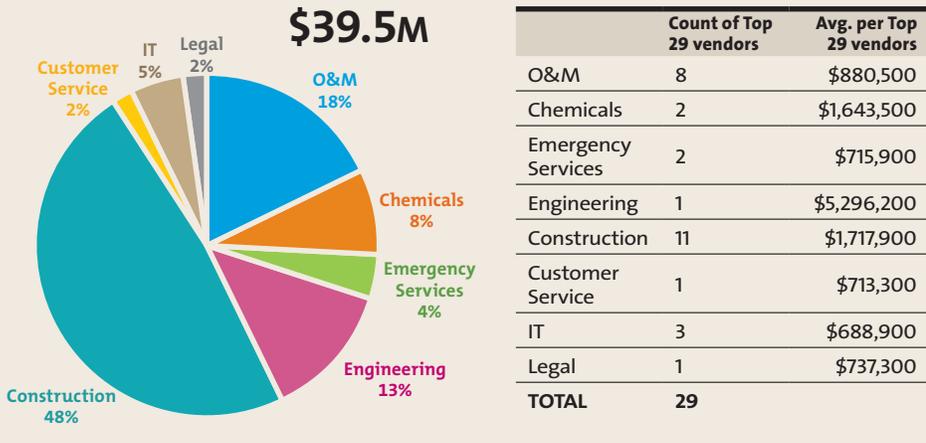
- Investigate rate structures to pay for capital improvements, including those driven by the wet weather plan.

» Wet weather management is a critical function virtually every community with a combined sewer system faces. Here in Pittsburgh, long-term solutions are being explored with a close eye on costs, which will obviously drive rates. Preliminary studies have been underway for some time, and the PWSA team is closely following ALCOSAN's recommendations, as they directly impact the city of Pittsburgh's wet weather operations.

- Restore large-volume customers by providing outreach and better-than-market rate deals.

» PWSA and Veolia Water staff, working as peers, negotiated a long-term contract with a large customer that benefits it with reliable service at a predictable long-term price, while returning PWSA's

Figure 5-4. Since PWSA is limited to finding cost-saving opportunities in Operating Costs and Capital Expenditures, it may want to consider opportunities in in-sourcing and procurement/purchasing for its contracts with the Top 29 vendors



single-largest source of revenue to paying status.

» This type of economic development initiative frees PWSA's consumers from having to bear the stranded costs of assets originally planned to serve large customers, and it may serve as a model for attracting other large water users.

- Assess opportunities to expand PWSA's service area to neighboring communities, design transactional frameworks and manage the acquisition or service-expansion negotiations and closing.

» PWSA is neighbored by a number of water systems under various forms of ownership. As with the water supply within its existing boundaries, it is likely much less costly for PWSA to provide water and/or water and wastewater services to these communities than it is for these small, independent

entities to produce their own supply.

» PWSA does not currently have personnel with the time or the skills necessary to pursue these types of agreements. Each requires a financial assessment to determine whether it is cost-effective from service and risk/reward perspectives to serve or acquire these utilities. The process of moving from the idea of service to signing a contract effectuating it requires specific skills and aptitudes embodied in the resources of a full-time professional tasked with these goals.

» Pursuing opportunities with neighboring communities is one of the most frequently articulated goals of PWSA Board members. Recognizing this desire, the 2013 PWSA budget contains funds to hire a full-time employee to perform this task.

- Proactively address needs of wholesale users. Review and update all wholesale water agreements, actively engaging and meeting with major water users to discuss their respective needs and receive feedback about services provided by PWSA.

» The current PWSA revenues have remained flat, due to decreased water usage of its single-largest customer. This decrease in usage essentially eroded the benefits of the latest rate increase to water users. Prior to enactment, potential rate increases should be discussed with large volume consumers to ensure PWSA's offering remain a best-value option for water and sewer services.

- d) Consolidate existing debt structure and improve financial bottom line to increase future borrowing capacity.

» The overall debt portfolio of the PWSA is complex and diversified, comprised of both fixed and variable rate debt. Veolia Water hired an outside firm to analyze the debt portfolio, and the suggested path forward includes updating the bond indenture; reviewing the letter of credit and credit facilities tied to the debt; and identifying potential debt restructuring for PWSA that would result in additional short-term positive cash flow and a positive net present value impact.

- e) Develop annual procurement improvement plan, showing target savings and strategies.

- » Develop a charter for the PWSA Selection Committee identifying procurement roles and responsibilities as well as policies and procedures for goods and professional services.
- » Conduct a spend analysis (by vendor, by category), identifying opportunities for optimization, consolidation and potential savings.
- » Standardize procurement by developing standard bidding documents, contract templates, terms & conditions, fleet policy, cell phone policy and MBE/WBE tracking/reporting process. See Figure 5-5, right.

Figure 5-5. Formalize procurement with standard policies and procedures



3. PERSONNEL AND STAFFING

In its 2010 Water Sector Workforce Sustainability Initiative Report, the Water Research Foundation anticipated that with the retirement of baby boomers, the water sector would expect to lose 30% – 50% of its experienced workforce within the next 10 years. Based on Veolia Water’s analysis of PWSA staff demographics, a similar “retirement bubble” can be seen.

Today, 9% of PWSA’s workforce is eligible for retirement (at least 60 years of age and 20 years of service). In 10 years, this jumps to 43% of today’s workforce. Crucial to PWSA’s future are succession planning and recruiting for the critical positions (directors, supervisors and licensed operators) that will become vacant. Today, 13 critical positions require immediate succession planning,

and 44 critical positions must be planned for over the next 10 years. See Figure 5-6.

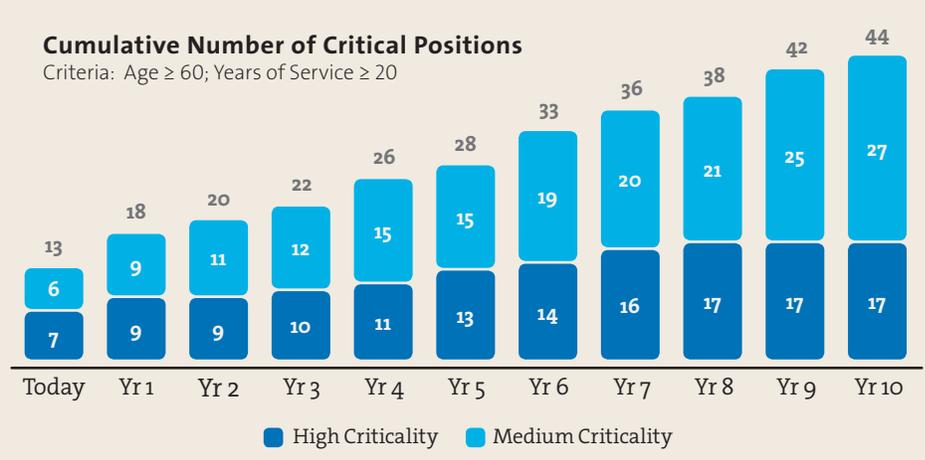
Furthermore, PWSA needs a more optimal staffing structure to support understaffed and new functions (i.e., wet weather management, large meter replacement, hydrant/valves maintenance and collection system maintenance).

OPPORTUNITIES INCLUDE:

- a) Reallocate personnel to understaffed and new functions to balance responsibilities and workload.

» Develop ideal organization structure that is aligned with future direction and business goals and prepared for employee turnover related to retirement and anti-qualified skills.

Figure 5-6. With the “retirement bubble”, PWSA can expect to fill as many as 13 critical positions today and up to 44 critical positions in 10 years



- » Create dedicated crews to manage PWSA's wet weather programs.
- » Create dedicated large-meter replacement crews to enhance revenue by improving accuracy of large meters.
- » Expand existing valve/hydrant crews for regular maintenance of assets and to reduce water loss. Some of this work is currently done by external contractors.
- » Expand existing sewer operations crews for regular cleaning and televising of pipes to minimize flooding and identify "hot spots" for pipe rehabilitation. Some of this work is currently done by external contractors.

b) Create a formal plan for critical positions through succession planning and recruiting.

- » Review skills and capabilities gap. Provide technical training and certification opportunities for skilled positions; develop bench strength/recruitment funnel; and identify needs and implement training to build management capabilities.
- » Develop and implement consistent job posting, interview and selection process/policies; select only qualified candidates; utilize diverse candidate sources; and understand residency requirement impact on recruiting qualified candidates.
- » Partner with local sources for recruiting.

c) Negotiate collective bargaining agreement (CBA) to optimize organizational efficiency and

Figure 5-7. Example: Unify job titles to leverage staff capabilities

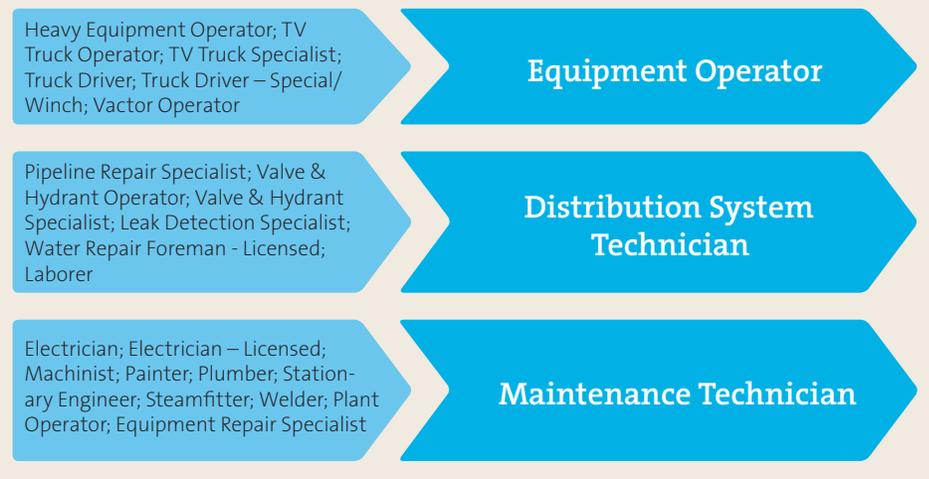
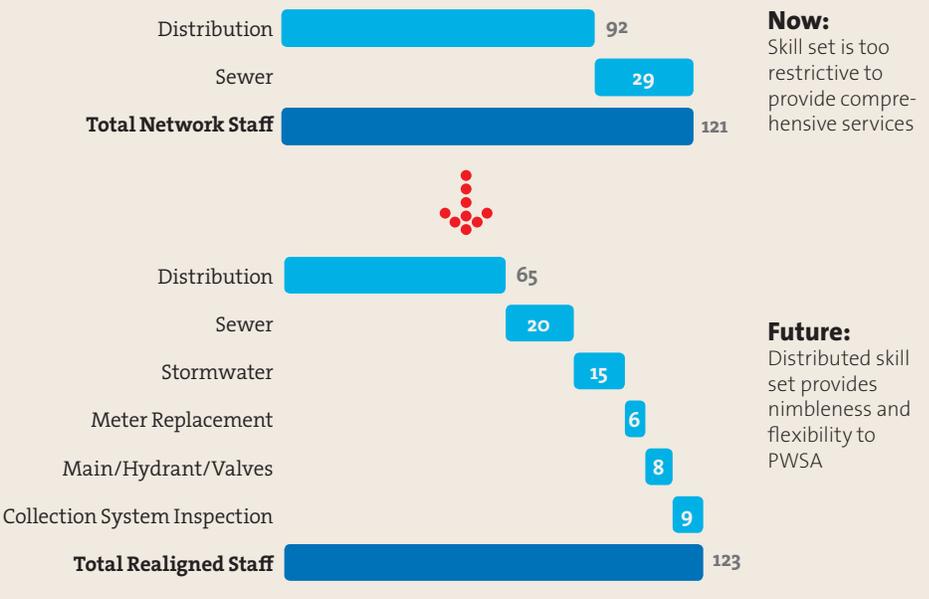


Figure 5-8. Reorganize workforce to support understaffed and new work functions



educate PWSA management on CBA implementation.

- » Unify 20+ job titles to three key ones to leverage staff capabilities (see Figure 5-7). Increase employee benefit contributions and align

short- and long-term disability with industry best practices. Implement a drug policy in line with industry best practices. Reduce CBA term to three years from five so the CBA can be more readily ad-

justed to meet anticipated PWSA staff demographic changes.

» Train management on personnel policies, procedures and the content of the CBA.

d) Build a performance-based organization. Increase Human Resources involvement in supporting performance management and total compensation increases.

» Develop updated position descriptions; implement annual performance management process—goals, coaching and evaluations; integrate with employee training and development; and foster a culture of accountability—rewards, recognition and consistent disciplinary action.

» Improve communication and cooperation among departments by implementing a performance management system with metrics to manage performance and accountability.

4. INFORMATION SYSTEMS

The Management Information Systems (MIS) Department consists of four full-time staff and two interns. While implementation of new technology may innovate the way PWSA works, it is critical that PWSA adopt the right strategy and have the capability to adapt practical IT solutions.

OPPORTUNITIES INCLUDE:

a) Reorganize the MIS Department to better reflect the current state of

operation. Create appropriate job titles and fill open positions to boost morale, and demonstrate that the department is capable of delivering quality service and more efficient operations.

» Roles and responsibilities within the MIS department need to be well-defined and documented. This will improve employee ownership and overall confidence in the direction of the department.

b) Redesign work flows by establishing an efficient process to address day-to-day user needs, such as security requests, new user accounts and equipment needs.

c) Reassess the ERP system, which is the computer hardware and software backbone of accounting and customer service. This includes the Cogsdale software, implementation contractor involvement, project

management and communication, plus coordination of the finished product delivery.

» This project carries significant costs and requires considerable time investment. Given the amount of dedicated funding and resources committed to the project, implementation should be further along than is currently being reported. Note: Expenditures are currently documented at approximately twice what was budgeted.

5. COMMUNITY OUTREACH

Customers and key stakeholders within PWSA’s service area and interested parties outside of it need a better understanding of their individual impacts on the environment. As a result of aging infrastructure (responsible for a multitude of water main breaks) as

Figure 5-9. PWSA’s new communications plan is structured to include a specific approach for each key stakeholder



well as several key regulatory events, significant investments in above- and below-ground water, wastewater and wet weather infrastructure need to be made. PWSA's customers—Pittsburgh residents and businesses—will bear the costs associated with these much-needed improvements, and they need to understand what is being done and why. See Figure 5-9, on the previous page.

OPPORTUNITIES INCLUDE:

- a) Differentiate PWSA service offerings from other public agencies. Help stakeholders understand the major utility players to provide a greater comprehension of infrastructure ownership and operation in Pittsburgh. Leverage a new, interactive PWSA website and social media to educate stakeholders.
- b) Communicate the water, wastewater and wet weather infrastructure needs to ratepayers and other stakeholders to gather consensus. Clearly project associated costs and the level of involvement of various parties and incorporate the existing MS4 permit-required stormwater outreach plan in PWSA's external communications.
- c) Develop a communications plan that leverages and integrates the on-going dialogue, outreach and education with partners, including Nine-Mile Run Watershed Association, 3 Rivers Wet Weather Demonstration Program and Green Infrastructure Network.

6. ENGINEERING

Best-in-class water utility engineering departments must have the right tools and expertise in-house to effectively manage large volumes of capital projects concurrently, to quickly respond to emergencies and to promote good stewardship of public funds. The use of KPIs will increase emphasis on fiscal transparency, understanding and accountability in the Engineering Department through scorecards and operational metrics. This initiative will build upon the transparency and allow PWSA to cascade responsibility and ownership down the line, empowering the engineering staff to drive performance and reduce capital spending waste.

OPPORTUNITIES INCLUDE:

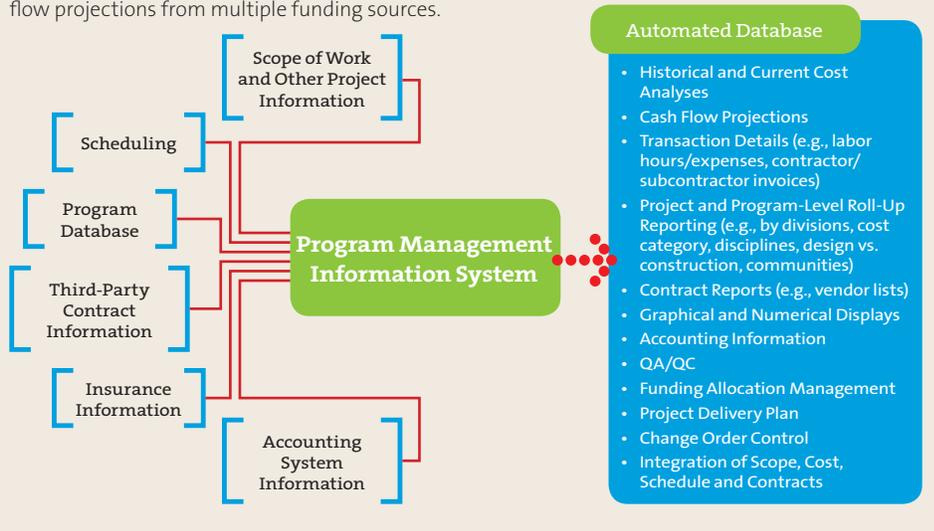
- a) Improve tracking of Major Projects (construction projects over \$500,000)

to make information available in a timely manner, improve cost and schedule control and project outcome/results.

- b) Better define roles and responsibilities between the Engineering Department and PWSA's consultants to improve communication, decision-making, accountability and efficiency. The goal is to empower PWSA staff to drive program management, capital planning and construction oversight.
- c) Implement a program management information system with a cost management module to track current spending and commitments and predict ultimate cost outcome; a schedule management module to track construction progress to date and predict ultimate schedule outcome; and a change management

Figure 5-10. Implement an integrated Program Management Information System (PMIS)

This system will provide faster and easier access to key project information, like costs, schedules and progress, and also automatically allow the effective prioritization of projects and generation of cash-flow projections from multiple funding sources.



module to track construction change orders and monitor cost, schedule and quality implications. See Figure 5-10, on the previous page.

- d) Empower the Engineering Department staff with KPIs to measure performance and to manage capital improvement projects' efficiency and quality, while minimizing project costs.

7. ASSET MANAGEMENT

Asset management is a key tool to determine which equipment is critical and which investments make the most sense at any point in time. Advantages of this program are a greater understanding of asset condition, improved reliability of systems, infrastructure planning

aligned with future growth/demands, better management of cash flow and a reduction in capital investment. By leveraging technical innovation and best-in-class processes and procedures, PWSA will ensure it delivers high-quality service cost-efficiently.

OPPORTUNITIES INCLUDE:

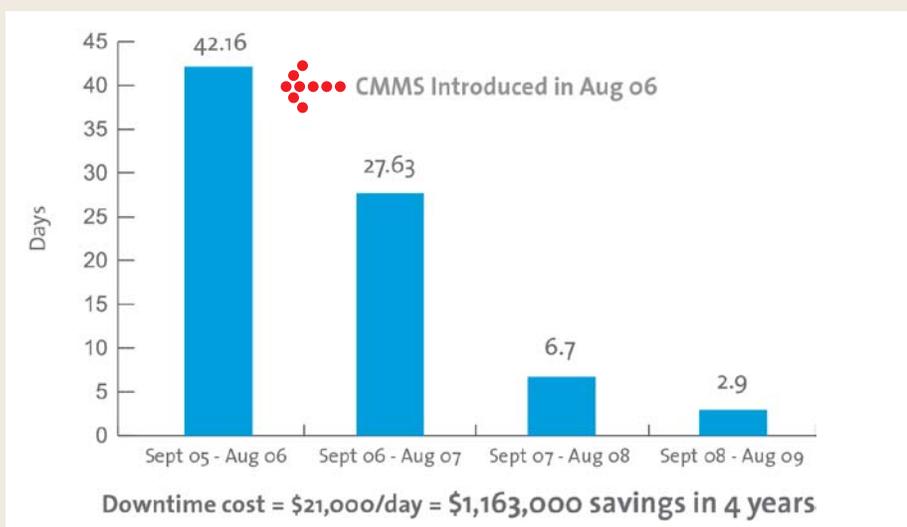
- a) Develop a 100% coverage asset registry. This validated baseline asset database would serve as a foundation for proactive maintenance and capital planning.
- b) Conduct condition assessment of critical assets to help PWSA determine which investments make the most sense at any point in time.
- c) Implement a computerized maintenance management system (CMMS) to reduce downtime costs

and systematically extend the useful life of PWSA assets. Currently, PWSA does not have a manual or computerized system for managing maintenance activities. Veolia Water and PWSA are currently evaluating makes and models of CMMS programs to determine the best fit for PWSA's needs.

- » See Example 5-1, below left, of the cost-saving potential of a formal asset management program.
- » Implement a mobile paperless work order management system. In conjunction with this program, document historical underground asset maintenance and institutional knowledge. See Example 5-2, next page.
- » Integrate pipe-break mapping and tracking into existing systems to record historical pipe-break data and system-wide pipe characteristics. With advanced analysis, this mapping and tracking can help predict the risk of future breaks and target proactive line replacements. All water main breaks must be documented to specific pipelines (with month/year of the failure) in order to build the database. See Example 5-3, next page.

- d) Develop a reliability-centered maintenance (RCM) program to balance between excessive risks and excessive waste and inefficiencies in keeping PWSA's water and sewer system operating consistently and reliably. This approach creates an understanding of full life-cycle costs of assets and the relative risks (e.g.

Example 5-1. Unplanned downtime reduced with state-of-the-art asset management using CMMS at an on-going Veolia Water project



treatment process guidelines and data tracking and analysis. By developing baseline correlations between operating parameters and water quality and then illustrating the data graphically, management and staff can quickly observe anomalies. In Example 5-4, right, there is a high degree of correlation between the ferric chloride dose (FeCl₃) and raw water quality (turbidity), indicating a very stable process. In subsequent months, if any value is outside of the “normal baseline”, corrective actions can be taken to restore normal operations.

» Utilize targets (or KPIs) tied to specific areas of the utility to serve as the basis for inspection, maintenance management and reporting processes for the water and sewer system. See Example 5-5, below-right.

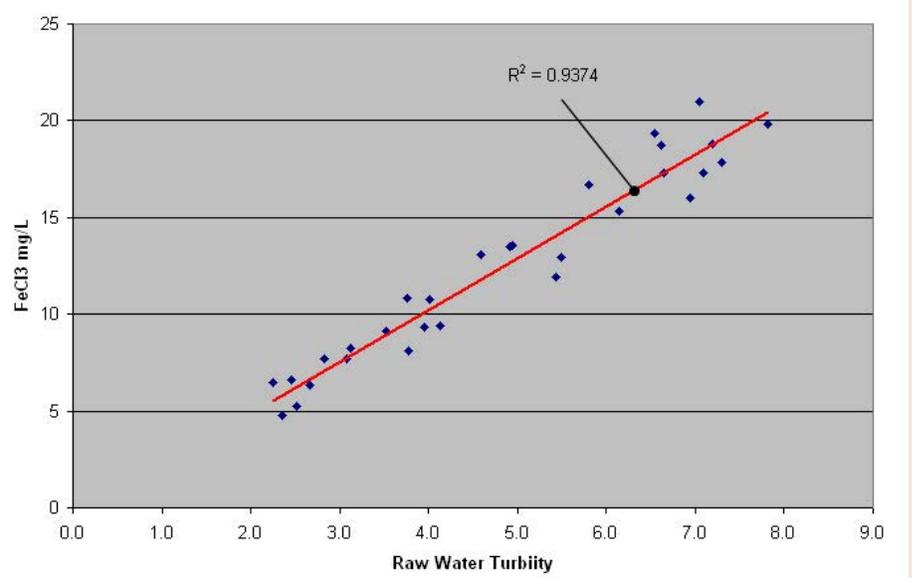
e) Improve resource planning of maintenance staff.

» Investigate maintenance alternatives. For example, as part of a comprehensive fleet overhaul, before making an in-kind replacement, pilot test equipment (such as new compressors and mini excavators) that may expedite workers’ ability to execute their responsibilities. Another example is a new small vector that would allow PWSA water meter crews time to clean out valve boxes or manholes and increase their productivity.

» Ensure that the right people with the right equipment are sent to do the right jobs. For example, ensure that skilled maintenance staff are

Example 5-4. Plant management must include SOPs for water quality

SOPs should include establishing baseline correlations between operating parameters and water quality, which enable easy-to-use trend analyses that prompt corrective actions where necessary to maintain normal operations.



Example 5-5. KPIs are essential for managing the water and sewer system

The following potential KPIs are an example of what could be measured and tracked against performance objectives on a regular basis to manage inspections, maintenance and reporting.

KPI	Industry Standard	PWSA Value (E)	Comment
SSO Inspections	Once per month	Once per week	Reduced inspections will allow reallocation of work to other areas
Water Tower Inspections	Once every 3 years	Once every 5 years	Increased inspections will identify potential problems and improve water quality
Condition Assessment on Critical Electro/Mechanical Assets	Annually	> 5 Years	Increased inspections will significantly reduce unexpected failures
Open Work Orders > 1 Month	10%	35%	Improved turnaround time will ensure equipment is readily available
Lab and Operating Status Report Updates (data)	Daily	N/A	Increased awareness will improve accountability and productivity

Note: PWSA’s values for maintenance KPI are estimated in this example. For actuals, we recommend PWSA implementing a tracking system for its maintenance work (including type of maintenance activity, equipment ID, and the date maintenance is performed).

not inappropriately assigned to administrative tasks.

» Evaluate opportunities to reduce repair crew travel time by basing crews out of satellite locations.

8. OPERATIONS

Composed of 187 skilled and unskilled workers, PWSA operations staff are committed employees who carry out daily tasks and do what is needed to keep the water pumping in compliance with applicable drinking water standards. The facility managers each have in excess of 30 years with PWSA. The plant staff took pride in sharing past successes in keeping the plant operational despite major challenges (i.e., power outage, loss of controls, pumping issues). In conjunction with opportunities to improve asset management, PWSA has opportunities to enhance revenue production and reduce operating costs.

OPPORTUNITIES INCLUDE:

- a) Conduct a water meter system audit for fair cost-sharing among customers. Determine the age, make, model, size, and accuracy of PWSA meters. The meters are the cash register of the utility system, and their accuracy is critical to ensure every customer pays their fair share of costs.
- b) Evaluate chemical usage. One recommendation is to convert the existing dry potassium permanganate feed at the water



Optimization example: Sodium permanganate feed system for a small water treatment plant.

Conversion to sodium permanganate saved more than 45% of the operating costs and labor versus the old potassium permanganate feed system.

treatment plant to liquid sodium permanganate to help reduce operating costs. Although sodium permanganate is more expensive pound for pound than potassium permanganate, Veolia Water has found that its other facilities realize savings in dilution water, operational labor and maintenance costs that more than offset the increased chemical unit cost. The liquid chemical also creates fewer issues in handling, storage and feed application than the dry chemical product. See example, above.



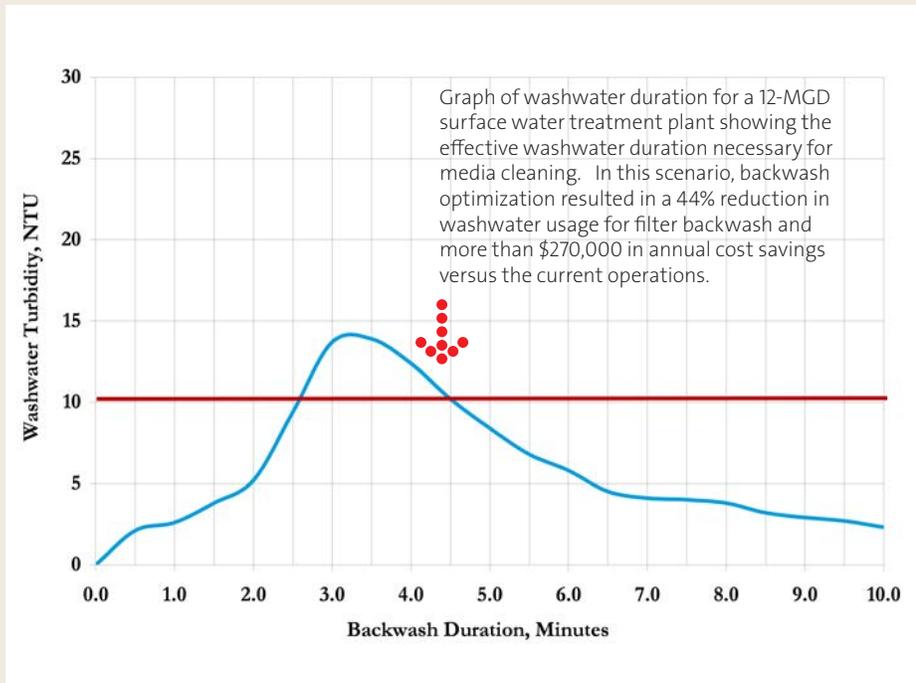
Optimization example: A small hypochlorite generator that requires minimal operator attention.

The generator produces a 12.5% sodium hypochlorite from brine solution and can be automated to batch solution into storage as needed.

Another recommendation is to install high-strength (12.5%) sodium hypochlorite generators at the chlorine booster stations in lieu of constant hypochlorite deliveries and operator attention. See example, above.

- c) Optimize the filtration and backwash operations for cost savings through reduced wash duration and washwater usage. Example 5-6, next page, depicts sufficient turbidity reduction achieved at 4.5 minute mark.
- d) Ingrain organization-wide safety culture to improve PWSA's recordable incidence rate (RIR), which was found to be nearly three times the industry average in 2011. The OSHA RIR measures the annual rate of occupational injuries or illnesses that require medical treatment beyond simple first aid and meet the OSHA recordable criteria per actual hour worked. See Figure 5-11, right, showing industry averages from the Bureau of Labor Statistics (BLS).

Example 5-6. Terminate washwater flow once turbidity falls below 10 NTU



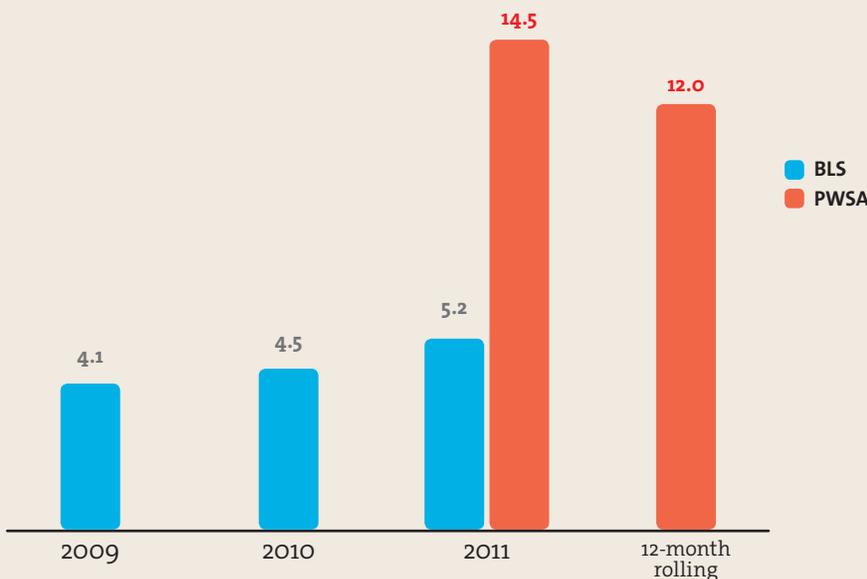
9. WATER QUALITY

PWSA currently serves 113,000 sewage connections and 83,000 drinking water service connections, making PWSA one of the largest combined water and sewer authority in the state. As a combined utility, the PWSA works closely with the Pennsylvania Department of Environmental Protection (PADEP) and the Allegheny County Health Department (ACHD) to meet all requirements for treating and distributing Pittsburgh’s source water, the Allegheny River, as well to minimize sources of pollution affecting the river. These include accidental release of contaminants from industrial processes; cumulative impact of discharge from power plants; cumulative release of petroleum products from pipeline ruptures; stormwater runoff from lands adjacent to the river; and combined sewer overflows (CSOs).

OPPORTUNITIES INCLUDE:

- a) Increase transparency of process control and reporting at the water treatment plant to manage safety, compliance and efficiency among the plant, laboratory and distribution system.
 - » Develop a PCMP for the water treatment plant, including five important unit process strategies. The PCMP will facilitate staff training, improve process control, denote early warning for non-compliance trends and improve coordination among staff.

Figure C-19. PWSA’s historical recordable incidence rates exceed industry averages



» Update the laboratory QA/QC program by reviewing the existing program and conducting a laboratory audit.

» Initiate the use of regulatory compliance metrics to reduce compliance nonconformance. Review the various current regulatory requirements for the treatment plants and implement a monthly compliance tracking report to verify and communicate compliance.

b) Implement an automated CSO detection system to capture simultaneous data from a multitude of underground locations to model the combined sewer's performance and optimize the dispatch of PWSA cleanout crews. Current practice consists of visual inspection with limited quantitative monitoring.

» Install height sensors and CSO detection devices (see Example 5-7, next page) on the 17 locations identified as being "hot spots." The data would be pulled three times a week by the crews on a walk-by mode, thus helping them better understand what really happens at the designated locations, without disturbing their way of working.

» Use the collected data to optimize the frequency of rounds to the identified CSO locations and activation of the "alarm" capabilities at these sites.

» Fully implement the CSO detection devices at the other locations after approximately 10-12 months of initial implementation.

10. WET WEATHER

When it rains or when snow melts, excess water can cause flooding and overload the sewer system resulting in sewage overflows into area creeks, streams and rivers, carrying pollutants which can include untreated sewage. Plans to reduce wet-weather-related pollution and flooding are being developed, with a stormwater utility study underway and a LTCP for the reduction of wet-weather CSOs required by a PADEP Consent Order due in July 2013. The sewer-collection/treatment relationship with Allegheny County Sanitary Authority (ALCOSAN) complicates planning, as ALCOSAN is contractually required to accept all of PWSA's sewerage flow. ALCOSAN is also under a Consent Decree, which is not in sync with PWSA's plan chronologically or, in some areas, conceptually.

OPPORTUNITIES INCLUDE:

a) Integrated management is a new approach to reducing water pollution increasingly embraced by the U.S. EPA. At its essence, it replaces presumptive water quality standards with performance standards that allow for a more cost-effective approach to meeting these standards and in a way that promotes innovation, such as the enhanced implementation of green infrastructure. While it is unrealistic to expect PADEP to extend the July 2013 due date for the LTCP, working with PWSA, Veolia Water will strive to have consideration for this approach included in it and implemented over

the life of the plan, potentially saving Pittsburgh ratepayers millions of dollars without jeopardizing water quality improvements.

b) Early in 2013, Veolia Water, working with the city and a number of foundations, is convening a series of meetings with local, regional, national and international experts on green infrastructure approaches and policies that can be used to "green" PWSA's LTCP in whatever form it is ultimately submitted.



Example 5-7. The Ijinus height sensor and the CSO detection device can be used for an optimized dispatch of field crews and a better understanding of the system's behavior



The Ijinus height sensor

This ultrasonic, numerical level probe measures the depth of water inside a sewer. The unit is watertight and nonflammable. It is a cost-effective flow monitor for CSO/SSO locations. Each measurement is stored in the unit's memory until retrieved and removed. Using appropriate radio-read interface technology, measurements can be retrieved remotely by driving/walking past the location where the sensor is deployed or by pulling the data from a server to which it has been sent via a GSM-box.

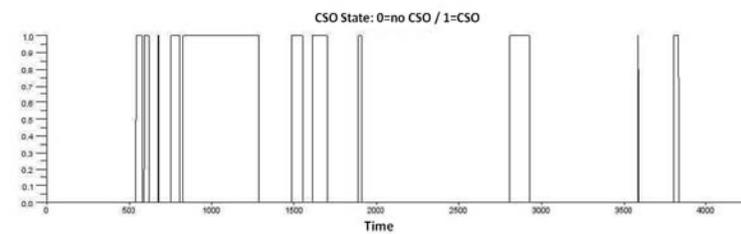
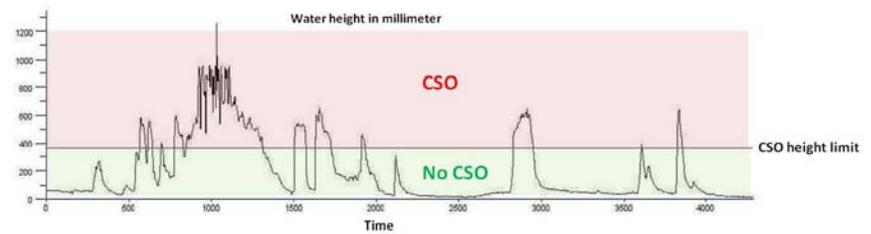
The CSO detection device

Physically linked to an Ijinus height sensor, the CSO detection device controls and adapts the frequency of the height measurements. To reduce battery usage, the measurement frequency is low when there is no CSO and increased during a CSO event.



installed Ijinus height sensor

installed CSO detection device



Ijinus CSO system: a cost-effective first step to better CSO management

System implementation benefits:

- An alarm can be sent to any email box when a threshold is reached.
- The time-stamped data (height and CSO state) stored in the memory of the height sensor can be pulled on a walk-by mode or remotely. Given weir characteristics, the height data can be used to model flow.
- Staff will develop better knowledge of the behavior of each CSO location.
- Staff can better target interventions where problems occur. This does not necessarily mean less intervention.
- What was not seen before will be seen now, thanks to the alarming system.
- Crews can be scheduled more effectively with full CSO information.
- More robust data will be sent to PADEP each month, including the information for each CSO location, an estimate of the number, duration and volumes spilled.
- The collected data can be used for other purposes, such as model calibration.
- The installation of the CSO detection device will help PWSA to identify the weak points of the sewer system and, thus, prioritize the work to address the issues observed.
- This cost-effective solution can be PWSA's first step for a more global CSO reduction strategy in which capital planning improvements programs will take place.



The path forward

governance and support systems

Priorities for 2013 and beyond

Keeping the end goal in sight: a high-performance and future-oriented PWSA

PWSA's three key priorities for 2013 and beyond are:

- Organizational development and stability
- Quality service
- Financial discipline

Veolia Water is committed to assist PWSA with these priorities for the remainder of the initial contract term.

Metric-based performance appraisal

Today, PWSA can collect data to benchmark itself in key areas of water and wastewater utilities operations and management using QualServe indicators developed jointly by the American Water Works Association (AWWA) and the Water Environment Federation (WEF). The 2007 Annual Survey Data and Analyses Report has just been released, which shows the performance across almost 350 water and wastewater utilities. Indicators cover:

- Organizational Development

- Customer Relations
- Business Operations
- Water Operations
- Wastewater Operations (includes wastewater collection system)

This benchmarking program can be a continuous-improvement model for PWSA to build a performance-measurement system to improve its operational efficiency and effectiveness.

Processes and programs

PWSA is in much need of standard processes and programs across the board to support informed decisions in capital replacement, programmatic maintenance, financing, training, succession planning, etc. We recommend:

- Establishing proven programs in quality control to monitor activities to find and fix problems. The ultimate goal is to ensure good quality of water.
- Implementing a safety program to reduce PWSA's incidence rates to national standards, making PWSA a safer employer for workers and the public.
- Utilizing a system to manage contracts to ensure vendors

complete work on time and on budget, reducing cost overruns.

- Generating easier-to-understand financials to provide transparency to the Board, PWSA staff and the public, improving accountability.

A high-performance & future-oriented PWSA

Sustaining organizational development and stability

By the end of the partnership, Veolia Water envisions a self-sufficient PWSA that is well-positioned for the future with the appropriate staff allocation armed with the right systems and processes to deliver better value to its ratepayers year after year.

Strengthening governance

Veolia Water will continue to monitor and strengthen PWSA's accountability and transparency within the organization and externally with the Board and its consultants. Key measures include:

- Regular Steering Committee meetings composed of PWSA Board members to review progress, make decisions and remove barriers.

- Ensuring executive sponsorship of initiatives to provide accountability and drive the pace of change.
- Dedicated PWSA staff to facilitate implementation of initiatives and promote new suggestions on a rolling basis.
- Rigorous implementation tracking through industry metrics.

Building capability

At the onset of the PPS model, Veolia Water committed to working shoulder-to-shoulder with PWSA instead of “doing the work” or “telling your staff how it’s done” approaches. While Veolia Water experts generally take a leading role at the beginning of an initiative to jump-start change, Veolia Water is conscientious in explaining the “why”, providing unbiased perspectives and ensuring that PWSA staff gradually take on full responsibilities to drive operational and efficiency improvements and make informed decisions. Veolia Water will continue to provide a combination of the following:

- Formalized capability-building workshops: Participants and facilitators come together to learn and understand skill concepts.
- Industry insights informational sessions: Participants gather insights on products, services and project approaches in the market.
- Field application: Participants apply the concepts in their day-to-day

work soon after learning, thus reinforcing new skills.

- Coaching: Participants and facilitators discuss how best to apply new capabilities, the results of that application and how to continue to build strength.

Taking more steps toward providing quality service

Keeping momentum going on improvements across the 10 functional areas

To organize more than 100 improvement ideas identified by PWSA and Veolia Water, Veolia Water devised the 10 functional areas illustrated in this Study Report as part of the implementation program. In the remaining six months, Veolia Water will work closely with PWSA to achieve all the milestones for the seven KPIs, namely Customer Service, Communications, Safety, Compliance, Capital Projects, Finance and Leadership and Training. However, much work is still needed to create additional change initiatives and design them to work effectively in coordination across the three PWSA divisions.

PWSA will benefit from the experience of Veolia Water experts who are familiar with the challenges to implementing and sustaining change. For example, choosing, implementing, training on and building buy-in for a new CMMS that can revitalize PWSA’s asset management program will take several years to fully implement.

Another example is pilot testing of complex initiatives across distributed assets (i.e., sewer collection systems or maintenance yards) at the asset or facility level before rolling out organization-wide.

PWSA can tap into Veolia Water’s water/wastewater expertise, which includes asset management, operations, telemetry and automation, IT, training, procurement methodology, and performance management tools. In this way, PWSA will continue to benefit from knowledge of industry best practices—both from the U.S. and across the globe.

Implementing additional Opex Initiatives to improve the bottom line

At the time of reporting, Veolia Water had begun evaluating additional opportunities worth several million dollars. Once validated and approved by the Steering Committee, Veolia Water will work closely with PWSA staff to implement as many of these opportunities as possible in the remaining six months. Veolia Water is deeply committed to operational and efficiency improvements with zero cost-saving layoffs at PWSA.

Each Opex Initiative begins with extensive data collection and a deep-dive evaluation by Veolia Water subject experts to test the technical and financial soundness of the business case. Upon validation, Veolia Water submits the business case to the Steering Committee for approval.

Once approved by the Board, Veolia Water works closely with PWSA staff to implement the opportunity. From the start of evaluation to the sign-off by the Board, the business case process for each Opex Initiative takes two to five months. Implementation time varies, depending on capital improvements and/or organizational process changes.

Strengthening financial discipline to keep pressures off rate increases

Managing debt portfolio

2013 will be an important year for PWSA as it refinances \$100 million of its debt. By working closely with PWSA's financial advisor, Bond Counsel and the bond market, Veolia Water will continue to facilitate the restructuring of PWSA's debt to provide more cost-effective options in securing future long-term borrowing. Veolia Water is looking to tap into the bond market under current market conditions to realize at least \$3 million in savings from debt restructuring.

Keeping costs in line with revenue

For any organization, the financial bottom line can be improved through revenue enhancements and/or cost reductions. Improving the financial bottom line can help minimize the need for a rate increase.

Veolia Water will continue to work closely with PWSA to implement a large customer outreach program and

expand PWSA's service area. Within the remaining six months of the initial contract term, Veolia Water anticipates working with PWSA to implement as many of the additional Opex Initiatives identified as time permits. Such initiatives are worth several million dollars, in addition to the \$1.5 million of Opex Initiatives currently under implementation.

Strengthening department-level accountability

Running a utility like a business requires departments and staff organization-wide to be accountable for revenue and expenses. Through its interim directors, as part of Veolia Water's interim executive management services, PWSA is gradually transitioning from a top-down budgeting process to a bottom-up budgeting process. This is no simple task, as it requires a fully functional ERP system to automatically generate department-level monthly financial reports and facilitate ongoing dialogue among departments, tracking revenue and expenses with discipline and rigor across the organization. Ultimately, this will provide more opportunities to identify additional revenue enhancements and reducible expenses.

Together, we can accomplish a great deal

Vision for the future

We believe a full transformation to a high-performance and future-oriented PWSA is possible and achievable in **three to five years**. We believe PWSA can achieve its full potential to become the best water/wastewater utility in Western Pennsylvania in both service levels and financial bottom line.

A full transformation to a high-performance water utility is a challenging project. The process of integrating industry standards and best practices takes time. In addition to time, this effort requires dedicated management to execute new policies.

The "PW1SA" campaign and the early successes of the PPS partnership are only the start of a long effort to transform the culture that PWSA and ratepayers expect and deserve. With Veolia Water's support, PWSA is on track to achieve its full potential in both service levels and financial stability.

Continuing the progress of this structured change-management effort is the next step in realizing PWSA's vision. Together, we can accomplish a great deal.

Special Thanks

We would like to extend special thanks to all the PWSA staff that have provided immeasurable help and support for the PPS partnership. We look to accomplish more together to create more value for our Pittsburgh ratepayers.

And to the Veolia Water team:

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