



Performance Audit

PITTSBURGH WATER AND SEWER AUTHORITY

Report by the
Office of City Controller

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June 2017

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AUDITEE RESPONSE



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CITY CONTROLLER

First Floor City-County Building • 414 Grant Street • Pittsburgh, Pennsylvania 15219

June 8, 2017

To the Honorables: Mayor William Peduto and
Members of Pittsburgh City Council:

The Office of City Controller is pleased to present this performance audit of the *Pittsburgh Water and Sewer Authority (PWSA)* conducted pursuant to the Controller's powers under Section 404(c) of the Pittsburgh Home Rule Charter.

EXECUTIVE SUMMARY

The Pittsburgh Water and Sewer Authority is responsible for producing and supplying water to a majority of the City of Pittsburgh residents along with maintaining and operating the water and sewage infrastructure. The Authority also sells bulk water to Reserve Township, Fox Chapel Borough and Aspinwall Borough.

This audit assesses the authority's billing, delinquency and exoneration process and procedures; evaluates customer service effectiveness; investigates and assesses the new wireless meter interface unit installation; evaluates the computer software systems used for billing, delinquency tracking, and infrastructure asset management; reviews overall finances, emergency requests and cost of construction vs. emergency repairs. This audit also examines the concerns about lead in PWSA drinking water, procedures for preventing lead in drinking water and the cost savings and effectiveness of hiring private contractor Veolia Water North America – Northeast, LLC, ("Veolia") in managing the Authority.

PWSA is governed by a seven-member Board of Directors appointed by the mayor for 5 year terms. As stated in the City's Home Rule Charter, board members serve at the will of the mayor.

Findings and Recommendations

The scheduling of this PWSA performance audit ran concurrently with widespread problems with customer billing charges and usage readings. Complaints reached the members of Pittsburgh City Council who requested immediate intervention. These problems occurred under the hired water management services organization called Veolia.

PWSA contracted with Veolia to provide as per the contract “executive management services, general administration and management consulting services, and financial and infrastructure management consulting services to the authority”. PWSA’s board of directors signed 3 contracts with Veolia over 3.5 years.

Contracted Terms of Compensation

The Veolia contract provided 3 areas where the contractor could receive compensation, 1) base salary, 2) key performance indicators (KPIs) and 3) recognized cost savings or improvement initiatives. Each contract included a base monthly salary. For the first contract year the monthly base salary was \$150,000. During the next 2 contracts, the amount varied depending on successful appointment of an interim executive director, in 2012 appointing a study manager, interim chief operating officer and in 2014 appointing an interim finance director. The appointment of the interim employees was to be hired by Veolia, but paid by PWSA.

Finding: PWSA board of directors paid Veolia over \$11,000,000 during the 3.5 year contract.

Continuing Payments to Veolia

Veolia, as per the contract, should have received a percentage of all “improvement initiatives” savings until December 31, 2016. If all pending and expected charges are paid to Veolia, PWSA will have paid a total of \$15,619,975.

Key Performance Indicators (KPI)

The contract states “each KPI will have a well-defined and measureable objective against which achievement may be measured. KPIs may be multi-focused, sliding scale, and/or subdivided into more than one initiative”.

Finding: Veolia and PWSA developed KPIs that did not fulfill the terms of the contract because they were not measureable goals.

Recommendation: PWSA board of directors should insist that contract provisions are followed. KPIs should be clear measurable goals, rather than an outline of a list of tasks to be completed by a contractor.

Recognized Cost Savings or Savings from “Improvement Initiatives”

Veolia was being paid a percentage of any cost savings. These cost savings were not explained or outlined in the contract. Improvement initiatives were presented to the steering

committee for approval and if approved, then submitted to the board for approval, rejection or modification. Veolia was being paid 40% of recognized cost savings from “improvement initiatives”.

Finding: A list with explanations of the improvement initiatives paid to Veolia is not available. This is an example of the effects of disjointed leadership.

Effectiveness of the Veolia Contract

Initial impressions of the Veolia contract appeared to have good checks and balances. The reality is that the board of directors and the steering committee are only volunteers or employees that Veolia hired serving part time on the steering committee. This makes it difficult to monitor the impact of KPIs or improvement initiatives on a daily basis. Hiring an outside firm to operate a \$174,000,000 authority and paying them a percentage of cost savings allows a potential conflict of interest.

Finding: The day to day operations are presented to the board of directors by the managers and because of allegiance to Veolia, their representation can be skewed.

Recommendation: The PWSA board should avoid hiring companies to manage the authority that require a percentage of cost savings. Agreements like this promote the company’s profits over the competent operation of the authority. It would be in PWSA’s best interests to hire employees whose allegiance is to PWSA and its efficient and effective operations.

Changes in Leadership

PWSA experienced many leadership changes throughout the years, from key managers to executive directors. Each change in leadership brings a learning curve. The staff must adjust to a new personality and a new way of doing things. This lack of consistency in an organization can cause confusion and frustration among employees, customers and the organization as a whole.

Finding: During the course of this audit, 3 different interim executive directors were in charge of the day to day operations of the authority. Frequent leadership changes make an organization inefficient and interfere with planning strategies to overcome daily problems.

Recommendation: The PWSA board of directors should work diligently to find an executive director with the knowledge and skills to manage PWSA operations. Employee retention is imperative and the chosen individual should be able to make a long term commitment. Included in this process should be frequent oversight of the current interim executive director.

In-house Legal Counsel

PWSA, sometime over the last 30 years, eliminated their attorney or solicitor position and outside legal counsel was hired.

Finding: Attorney fees for general counsel in both 2014 and 2015 cost the authority over \$1,200,000 a year.

Recommendation: The authority needs to hire an in-house general counsel solicitor. This person should offer support, protect the authority and be directed to handle most legal matters.

The authority hired an in-house legal counsel in October 2016 at a salary of \$108,000 a year. The amount of cost savings is currently unknown because PWSA still retains Clark Hill Thorp Reed as general counsel.

General Solicitor

PWSA believes that retaining the services of Clark Hill Thorp Reed is necessary because of the volume and specialty nature of the work. An analysis of the work load and what the general solicitor charges is beyond the scope of this audit.

Recommendation: The PWSA board of directors and management need to review legal costs and work toward their reduction.

Water Treatment Plant & Process

PWSA's water treatment facility is located within the City boundaries along the Allegheny River near Aspinwall. PWSA's water source is the Allegheny River.

Currently, the average daily draw of water from the river is 70 million gallons with a 100 million gallons daily maximum. Once the water is pulled from the river, it takes three days to process. This occurs in four separate stages: coagulation, sedimentation, filtration, and disinfection. The water is then pumped to one of 3 main reservoirs in Pittsburgh before it is distributed to customers.

The main regulatory body of PWSA is the Allegheny County Health Department (ACHD) which reports to the Pennsylvania Department of Environmental Protection (DEP). The PA DEP and the Environmental Protection Agency (EPA) regulate the amount of certain contaminants allowed in water provided by public water systems. PWSA tests and monitors all water for contaminants 365 days a year during the treatment process as well as on finished water.

Test Results for Contaminants at Treatment Plants

In 2014 and 2015, PWSA tested for 100 different contaminants in their water. Results of the tests are sent to the DEP and EPA and customers can access the results through PWSA's "Annual Drinking Water Quality Reports" posted on the PWSA website.

Finding: All the contaminants found at the two treatment plants were below federal and state contaminant levels for 2014 and 2015.

Recommendation: PWSA should write on every customer's bill that water quality reports can be viewed online or a copy requested by customer service. If possible PWSA should inform customers what treatment plant their water comes from so that the customer knows which quality report pertains to them.

Customer Water Usage Tracking

A customer's water usage begins with a water service line piped into the property from PWSA's main water line located in the street. The water line is connected to a water meter inside the house/property. Each water meter has a register on top of it that "registers" or tracks water usage for that property address. This register is then connected via a wire outside the house/property to a newly installed automatic meter reader device known as an MXU (meter exchange units) box. This MXU box electronically transmits the water usage amounts to a cellular control tower. This tower relays water usage information to PWSA's data collector.

There are 4 data collector control towers located throughout the City. This data is then transmitted to a remote network interface (RNI); RNI transfers the water meter usage amounts to a meter data management (MDM) company; The MDM Company conducts a "data sync" or type of validation to get the meter readings connected to the appropriate account number in PWSA's billing system which is Cogsdale. Cogsdale gets the customer's water usage and all billing information and forwards it to a company called Level One who prints and mails all PWSA's customers' water and sewage bills.

Finding: There are several companies involved with properly billing a PWSA water customer. At each step there is the possibility of an equipment malfunction and/or billing problem.

Billing Issues

In May 2016, the billing department was directed to review customer's monthly billing information before bills are mailed. They look for extremely high consumption rates and/or extremely high water bills. If high water usage is found to be 20% or higher from the last bill, the bill is pulled and investigated.

Recommendation: PWSA administration should continue the practice of reviewing bills for discrepancies before being mailed. This is a practical solution to solving questionable water consumption bills.

The Changes That Lead to Crisis

Three (3) main changes happened concurrently causing several problems for PWSA. The 1st was a change in their billing system from SAP to Cogsdale; the 2nd was a meter reading change; and the 3rd was the multiplier of the mid-size meter change out.

PWSA decided that they would change the billing system from SAP to Cogsdale. Using Cogsdale was cheaper than using SAP and provided PWSA with a billing system more tailored to the utility business. During the changeover it was found that Cogsdale experienced incompatible issues with SAP causing transition problems.

Originally the automatic meter readers and the AMI (advanced meter infrastructure) used to read those units were produced by a company called Landis+Gyr. The Landis+Gyr contract was to expire on September 1, 2014. PWSA wanted to change the terms of the Landis+Gyr contract because the monthly payments were costly, and the contract did not allow PWSA to own their customer service data information. So PWSA signed a contract with Sensus.

After the Sensus contract was signed, PWSA learned that Landis+Gyr's MIU boxes were not compatible with the new Sensus software. Therefore, all of the old MIU units needed to be switched to MXUs produced by Sensus. At midnight on September 1, 2014, Landis+Gyr went offline and Sensus's network took over with only half the City having the new meters installed.

Finding: If an account has not yet been transitioned to a MXU, any bills received would be based on usage estimates.

Finding: PWSA (Veolia) did not thoroughly investigate for compatible equipment in the Request for Proposal (RFP) that resulted in awarding Sensus the contract.

Finding: Prior to awarding Sensus the new contract PWSA (Veolia) did not require the company to do a test run or pilot program to show equipment compatibility.

Recommendation: The PWSA administration should require all changes in equipment contracts to run a test or pilot program. Such a test would prove the compatibility of the equipment and eliminate any unforeseen problems and additional costs with the equipment.

Subcontractor Issues

The plan to switch MIUs to MXUs was a huge project and Sensus subcontracted with Utility Metering Solutions (UMS) to install the new MXUs. Newly installed MXUs were not

reading and transmitting water usage. In some instances the water usage transmitted was excessively high. This resulted in a lot of unhappy customers. Until the problem became apparent, no one from PWSA checked to see if the contractor was installing the MXUs correctly. The solution was to have PWSA plumbers visit homes with inaccurate or no readings and fix the problem(s).

Finding: PWSA had to pay twice for installation of MXUs; once to the contractor and another time to the PWSA plumbers who had to correct the problems.

Recommendation: PWSA administration in future installation contracts should include inspections of completed work. No payment should be made to the contractor without verification that the work was completed accurately.

Billing Problems and Mid-Sized Meters/Register

While improperly installed meters/registers contributed to billing problems, the greatest issue causing bad reading problems was with the multiplier. Over the years PWSA has purchased at least 5 varieties of meters. Each type of meter with a register records water usage in a certain way with a multiplier. The multiplier associated with the register can read 1 to 1 or a register can read consumption in the power of 10, (x 10, x 100 x 0.1, etc.). In order to get a correct water usage number the reader needs to know how the register is reporting usage and must be programmed accordingly.

Finding: PWSA experienced multiple changes occurring at the same time to complicate billing problems. Not only was the change from Landis+Gyr to Sensus (MXIs to MXUs) causing problems with billing, PWSA switched billing software from SAP to Cogsdale. SAP was not compatible with Cogsdale and caused transition problems. Also, mid-size meter change outs needed to be completed for compatibility with MXUs and the new system.

Finding: The timing of the decisions made by PWSA caused it to be a “perfect storm” for major billing and equipment issues. Essentially the myriad of problems associated with all the changes happening at PWSA were not properly thought through. An experienced water management company should have been familiar with the type of problems that could occur with meter reader changeover and think ahead to anticipate and correct any of these problems.

Pennsylvania American Water (PAW)

Most of the City’s southern neighborhoods use Pennsylvania American Water because PWSA lines were never installed in these areas. But PAW charges more for water than PWSA. When water was controlled by the City of Pittsburgh Water Department, it was decided that the City would subsidize this extra cost to southern residents. Consequently, the City pays PAW the difference between City and PAW rates. This practice continues today with PWSA paying PAW about \$2,000,000 a year in water subsidy.

Recommendation: PWSA needs to explore the possibility of eliminating this subsidy without raising the rates of customers in Pittsburgh's southern neighborhoods.

Pennsylvania American Water Sewage Charges

PWSA collects ALCOSAN's sewage treatment charges for PAW customers. However, PAW uses the software SAP for its data retrieval which is now incompatible with PWSA's Cogsdale billing system. Consequently, some customers have not received a sewage bill from PWSA since December 2014. This was resolved by the end of June 2016 and bills have been set up on payment plans.

Finding: Most PAW customers, who are City residents, were not billed by PWSA for sewage charges from January 2016 until approximately August 2016 and longer in some cases. These sewage bill customers have been offered different payment plans depending on the amount due.

Recommendation: Offering PAW customers a payment plan for their sewage bill is a good practice and should be continued. PWSA should make every effort to accommodate each customer's ability to pay. If this situation were to ever happen again, billing should not be skipped; rather an average estimated charge based on the last 4 actual sewage bills should be calculated and mailed to the resident. Then when actual charges are reported adjustments can be made.

PWSA Customer Service

Customer Service has a total of 40 employees; 38 full time and 2 part-time. It is managed by a senior manager who oversees 5 sub-divisions:

- 1) AMI (advanced metering infrastructure) Team: Ensures accuracy in meter reading devices (MXUs);
- 2) Billing: Ensures accurate and timely delivery of bills;
- 3) Customer Service Contact Center: Provides prompt & courteous service;
- 4) Collections: Provides timely and accurate correspondence;
- 5) Dispatch: Assists customer and internal staff with accurate information for repairs.

In the organization chart first presented to the auditors the 5 subdivisions of customer service were not directly under the senior manager as originally stated. Further conversation yielded a revised organization chart. PWSA administration is revising the customer service organizational structure.

Recommendation: The proposed customer service organization chart should be immediately adopted. It explains management and employee responsibility in a concise way.

Customer Service Phone and Computer Software

The customer service contact center is staffed by 12 employees. The current telephone system uses Toshiba telephone equipment with basic Taske software that utilizes auto-attendant call trees with no analytic or reporting software.

Finding: This basic Taske telephone system has limited analytic reporting of the call. For example, no customer information, concern, property address or problem solution is tracked. However, calls are written in the individual customer record.

Recommendation: PWSA should upgrade its telephone system to a system that can track customer information and the reasons for their call.

PWSA Telephone Answering System

Long waits to speak to representatives were compounded by a cumbersome automated telephone menu system.

Finding: PWSA automated customer service telephone system is not efficient.

Customer Service Survey

The auditors conducted a random telephone survey during the period of March 7 through April 1, 2016 between the customer service hours of operation, 8:00 am through 6:00 pm Monday through Friday. A total of 70 calls were made at different times during the day.

PWSA's customer service performance goal in 2015 was to connect the customer to a general customer service representative in 5 minutes or less. In 2016 this goal was increased to 7 minutes.

The telephone survey results reported the shortest call wait time before a PWSA representative answered was one minute and 58 seconds (1:58); two calls occurred within this time frame. The two longest call wait times experienced were one at eighteen minutes and two seconds (18:02) and the other call at seventeen minutes and seventeen seconds (17:17).

Finding: Twenty six (26) or 37% of calls in the survey did not meet PWSA's 7 minute or under goal.

Telephone Menu Changes

In July of 2016 the messages on the PWSA telephone line were changed. The first 40 seconds are devoted to a welcoming message and then to sewage-only customers, explaining that these customers should be receiving monthly bills with no penalty or interest charges.

Finding: The new menu changes delay reporting emergencies and getting to customer service.

Emergency Calls

PWSA must have 24/7 telephone coverage in case of an emergency. Currently to report an emergency the main PWSA telephone line is called and as the second option on the automated message, one is connected in 53 seconds. An emergency by its very nature means that time is critical.

Recommendation: When the PWSA telephone number is called there should only be 2 options; 1 for emergencies and/or outages and 2 for all other calls. This would allow emergencies to be identified first, then under number 2 the other areas of interest could be listed.

Recommendation: Emergency calls should go directly to a live person (dispatch) to answer and take care of the problem immediately. If only one person is working the emergency line then the system must connect to someone else who can address the problem.

New Telephone System Request for Proposal

According to a PWSA press release on September 21, 2016, PWSA upgraded its telephone system on September 22, 2016. Customer service was closed from 2:30 PM until 6:00 PM. The email correspondence was still available as well as making payments in person at the main office with checks or money orders. A new number to handle emergencies during this time period was included in the press release.

Customer Service Email Correspondences

PWSA allows customers to contact their customer service department by email with questions or concerns. This email service and data tracking began in June of 2015.

Finding: The customer service department acknowledges that they did not always meet the goal of responding to customer's emails within 2 business days, but continues to make improvements. (This information is documented in the excel database used to track email correspondences. The date the issue is opened is included as well as the date the issue was closed.)

Finding: The emails are not consistently labeled for categorization. For example, emails about missing bills have fallen into several categories and include: “billing delay”, “billing issue”, bill not received”, “bill status”, etc.

Recommendation: Tracking emails (questions/concerns) is necessary for reporting and research. However, PWSA administration should make sure a category key is used during this tracking to ensure consistency and accurate reporting.

Email Correspondence Analysis

With over 1,500 different categories for approximately 5,025 email entries from June 1, 2015-December 31, 2015, it was impossible for the auditors to sort all of the emails. Therefore, the auditors, to the best of their ability, selected a sample of like categories; this was 2,619 or 52% of the emails

Finding: About 48% percent of the emails had categories that were too vague or were unable to be sorted easily.

Recommendation: PWSA customer service needs to establish general categories for recording emails and train personnel in using these categories. This will allow consistency of reporting.

Current Personal Water Problems and Testimonials

A Homeowner’s Experience

A homeowner told of interaction with PWSA that resulted in an incorrect analysis of his sewer line after a PWSA plumber videoed his sewer line. PWSA’s response was that the plumber was doing the homeowner a favor and shouldn’t have been videotaping the sewer in the first place.

Recommendation: One of the cost saving initiatives by Veolia was for PWSA to own a video camera truck. This truck and the resulting video should be made available to residents with street sewer problems.

A Contractor’s Experience

A contractor tells of PWSA wrongly identifying water lines in the street causing him to hit an unmarked water line. Water was gushing out and he had to call PWSA to report the

emergency so repairs could be made. He could not get through to talk to someone because no one answered. Having the emergency line manned at all times is a previous recommendation.

Recommendation: PWSA needs to document and map all water and sewer lines throughout the City. It needs to obtain a complete asset management software program to accurately track repairs and new installation of lines.

A Landlord's Experience

A landlord tells of problems with the PWSA on line bill pay system; payments are not immediately posted online and monthly bills are often posted late. This makes the service always behind. Water bills for July, August and September were missing on one property. After numerous calls and an email to customer service, four bills were received all dated the same October 10th date. The bills showed high consumption because of a leak that the tenant and landlord were not aware of. The landlord wrote a letter to the exoneration board in November 2016 and explained the situation. She received a letter acknowledging receipt of her request and that a hearing date would be scheduled. It has been 2.5 months and no hearing date has been set.

Recommendation: PWSA administration needs to investigate why monthly bills were not being posted online and why there was a delay in scheduling an exoneration hearing. Also the system needs to acknowledge online bill payments in a more timely fashion.

A Tenant's Experience

A tenant tells of a water break from Christmas Day to New Year's Day. Water was turned off and on without warning, 24 hours of the day. The tenant never received notification of this service interruption from PWSA. Also the entire street was closed for access, preventing use of the street for driving and resident parking.

Finding: In this instance PWSA did not communicate to all residents when the water was being disrupted.

Recommendation: PWSA needs to establish a protocol to notify all residents, including tenants, in the surrounding area of a water main break. The street should have been posted with signs explaining the disruption of service and notice of when PWSA expected the problem to be fixed.

Types of Customer Payments

According to the PWSA webpage customers can pay their bills five (5) different ways: 1. Electronic Bill Payment and Presentment (EBPP), 2. One-Time Remote Bill Pay via Telephone or Online, 3. Cash Payment at Any 7-Eleven or Family Dollar Location, 4. Zipcheck Payment or at the 5. PWSA Customer Service Center.

Electronic Bill Payment and Presentment (EBPP)

The EBPP is a free online bill paying service that allows customers to receive monthly emailed bills and make payments online. This service is environmentally friendly as it prevents wasted paper caused by bill printing and saves the cost of postage by sending/receiving payments.

Finding: The customer is not able to log onto the website unless they have a pre-established email and their account number handy to use this service.

Finding: Customers that receive emailed bills do not receive any notification if their bills are unusually high.

Recommendation: Customers enrolled in this monthly automatic bill pay should receive an email before the money is removed stating when it will be deducted and how much. This will allow the customer to contact PWSA if there is an issue before the money is deducted. Auditors found in their research that other utility and bill-pay services do this already.

Recommendation: PSWA should study offering an incentive to their customers to promote going green. A joint promotion with a local bank or sporting goods store might be worthwhile or a discount could be offered to the online subscriber.

Recommendation: PWSA should allow an alternative identifier to create an account in lieu of the account number if a customer does not have it readily available. Other utilities and companies use other personal descriptors such as social security number, address, and zip code or answer a security question in order to access account information. Some companies offer more than one identifier to choose from.

One-Time Bill Payment via Telephone or Online

Finding: This option seems relatively easy but you are not told the amount of the fee for this service. As a test, auditors went through the first three steps and reached the page asking for the credit card number. **At no time was the fee listed.**

Recommendation: Customers should be told how much the fee is for the service prior to entering their personal information.

PWSA Customer Service Center

Recommendation: PWSA should explain on their website and on customer's bills that payments can be dropped off in the lobby of the Penn Avenue offices.

Zipcheck

Zipcheck is an automated bill pay system that allows PWSA to automatically deduct your bill amount from a designated account every month when your bill is due.

Finding: The website does not indicate how long it would take for this autopay process to be complete after you have sent the check and application.

Water Shut Off Process for Delinquent Accounts

If a company or individual doesn't pay their water bill, after a certain period of time PWSA will shut off their water.

Finding: In PWSA's section 209.0 Termination of service, "Customer Rights and Obligations" has contacting customers by telephone as a last effort not at the beginning of the process.

Recommendation: If contacting a delinquent customer initially by telephone is a new part of the termination of service collection process, then PWSA needs to update section 209.0 Termination of service, "Customer Rights and Obligations" on its webpage.

Shut Off Notices

Finding: In 2015, there were 630 shut offs and 11,756 postings to properties warning of possible shut offs if the bill was not paid in full. This represents 5% of posted properties that got their water shut off due to delinquency.

State Requirements for Utility Termination of Service

As an authority, PWSA does not have to follow State requirements for utility termination of service. However in comparison to the state, PWSA gives more time before termination of service.

Finding: In PWSA’s section 209.0, Termination of service, “Customer Rights and Obligations” there is no minimum outstanding balance owed before PWSA shuts off the water. A customer can owe \$10 or \$300 and have their water shut off if no payment is made within 30 days. There is no minimum dollar amount for termination of service in the State requirements.

PWSA’s “Customer Rights and Obligations” mentions nothing about stopping termination if a person has a medical condition that requires him or her to have the utility kept on.

Recommendation: PWSA board should establish protocol for a sick individual’s water to not be turned off. The state regulations provide a 30 day leeway and the board can use that as a guideline and/or partial payment of the bill can also be required to keep the water on.

Delinquent Accounts

Media reports have claimed that PWSA has millions of dollars owed to them in delinquent accounts yet keep raising water rates. The 2014 PWSA report had 190,713 accounts showing delinquencies totaling \$34,090,266.39. For 2015, the report had 198,080 accounts totaling \$40,934,552.18.

The auditors discovered that some delinquent accounts include City-owned properties and also accounts that existed in the old PWSA software system that did not transfer properly into the new system. PWSA reported that these properties are designated as “orphan” accounts because they do not have good addresses, and most likely were demolished, vacated, changed ownership and were not properly removed from the system.

Finding: There were 14,156 orphan delinquent accounts totaling \$1,581,472.88 in 2015.

Finding: There were 595 City-owned accounts totaling \$2,146,752.12 in 2015.

Recommendation: PWSA needs to “clean up” the orphan accounts and verify that these properties can be removed, since bills cannot be mailed for the various reasons mentioned. Because of these accounts, PWSA outstanding bills data is skewed. If they are never going to be paid, they should be removed.

Recommendation: PWSA should work with neighborhoods and initiate a “neighborhood report line” that would allow neighbors to be watchdogs and report the abandonment of buildings in and around their neighborhoods.

Top 100 Delinquent Accounts in 2015

Finding: The majority of the top 100 delinquent accounts (95%) were non-residential.

Finding: The top 100 delinquent accounts with the highest dollar amount owed totaled \$9,457,696.26 for 2015. This is 23% of all the money owed to PWSA in 2015.

Abandoned/Vacant Properties

According to a February 9, 2016 *Tribune Review* article, \$6.3 million was owed to PWSA on 3,500 vacant lots. According to PWSA, these properties were billed continuously because they were not informed that the properties were empty.

Finding: This delay in the water being turned off at these properties potentially wastes water, and wastes paper generating bills. It also increases the number of unpaid accounts on record.

City-owned Properties Water Usage

In accordance with a 1995 agreement with PWSA, the City of Pittsburgh is allocated 600 million gallons of water per year at no charge. Conversations with PWSA administration revealed that no one keeps track of the water used by the City and, in fact, many government buildings are not metered so it is unknown how much water is actually being used.

Finding: Not all City property is metered making it impossible to know how much water is being used by the City.

The auditors discovered that the City properties in the top 100 delinquent accounts included City parks, swimming pools and senior centers. There were 8 City owned properties in our top 100 delinquent properties that totaled \$1,028,823.66.

Finding: The City's unpaid accounts inflate the amount of delinquent water bills on PWSA's books.

Recommendation: The City-owned delinquent accounts should **not** be included in PWSA's outstanding delinquent balance totals.

Recommendation: PWSA needs to make a decision on how to handle property owned by the City and its water usage. The 1995 agreement between the City of Pittsburgh and PWSA gives the City 600 million gallons of water a year at no charge. Currently, there is no means to calculate City water usage because not all buildings are metered. The authority needs to explore the costs of metering every City-owned building.

City Payments to PWSA

The auditors discovered that the City's Controller's office pays some of the PWSA City water bills that are for City owned properties. PWSA will mail these water bills to the Department of Innovation & Performance (I&P) for review. Then I&P will send the bills to the City Controller's office for payment. The City Controller's office will remit payment for the current amount due on these bills.

Finding: The City I&P Department authorized the City Controller's office to make payments on the estimated bills for 7 City-owned accounts for the entire year of 2015 without question. All of these properties are vacant.

Conversations with employees in the City's real estate department said that there is no formal policy for communicating to PWSA to shut off the water when a property is acquired by the City.

Recommendation: PWSA in conjunction with the City's real estate department and/or I&P Department should go out and investigate these properties and get an actual meter reading. There is a possibility that there has been no water usage at these properties for months or years. If there is no reading the accounts should be deleted out of PWSA's system.

Recommendation: The City Controller's office should stop making water and sewage payments on any estimated bill they receive from PWSA and I&P until an actual meter reading is provided. This should happen even if the Department of I&P approves the bills for payment.

Jordan Tax Service (JTS)

The Pittsburgh Water and Sewer Authority contracted with JTS to collect payment on delinquent water and sewer services on September 12, 2008. All accounts more than 90 days delinquent are to be turned over to Jordan Tax Service.

Finding: Auditors were told by PWSA staff that they still collect payments from accounts over 90 days delinquent.

Recommendation: PWSA customer service should stop collecting payments from delinquent payers over 90 days old.

Jordan Tax Services Fees

The JTS contract states that any compensation charges shall not exceed the amount set forth in the ordinance or resolution.

Finding: The auditors found Resolution No. 103 of 2008 which listed the not to be exceeded amounts for collections and services of municipal claims and municipal liens. Specific charges are listed in the resolution, a copy of which can be found in the appendix.

Jordan Tax Services Distribution of Payments

When payments are received in full, everyone gets paid for what is due. When delinquent claims are less than full payments or installments, Jordan distributes the payments in order of priority with everyone else getting paid first and PWSA getting paid last.

Finding: PWSA did not follow a past recommendation of the City Controller's 2010 audit regarding the Jordan Tax Service contract. This is despite agreeing to the recommendation.

Recommendation: PWSA needs to review the process around receiving money for partial payments.

Jordan Tax Services Delinquent Accounts

In 2014, there were 26,676 delinquent accounts totaling \$3,238,895.40. In 2015, there were 26,944 delinquent accounts totaling \$2,623,217.43. Conversations with PWSA staff indicated that most of the accounts given to Jordan are commercial accounts.

Finding: There was an increase of 268 delinquent accounts in 2015 from 2014, however, the total amount due decreased by \$615,667.97 or 19%.

Recommendation: PWSA needs to treat all past due accounts the same whether residential or commercial. Broken payment agreements or non-payment of bills should have their water shut off.

Jordan Tax Services Actual Collections

According to documentation provided to us by PWSA from Jordan Tax Services, JTS collected \$1,778,059.23 from clients January 1, 2015-December 1, 2015. PWSA collections totaled \$1,556,100.50 and JTS services and fees totaled \$221,958.73. This shows that approximately 14% of the money collected by JTS went to JTS and was paid by delinquent customers. While this shows that JTS is effective in the collection of delinquent payments, auditors recognized the hardship that their collection process can place on PWSA customers. JTS has established hardship payment plans but PWSA needs to do more.

At the point when the account is turned over to Jordan their water should already be shut off incurring a turn-on fee of \$125.00. Then once turned over to Jordan all collection costs are the responsibility of the delinquent party.

Recommendation: As recommended in the previous audit, PWSA should frequently reevaluate their contract with Jordan Tax Services to address the fee structure.

ALCOSAN's board of directors in October 2016 approved the Clean Water Assistance Fund to help eligible residential customers pay their sewage bill. Dozens of social service agencies that work with Dollar Energy throughout the region are now accepting applications. The Clean Water Assistance fund will support eligible PWSA customers.

Recommendation: PWSA administration should offer other alternatives for delinquent collections that are more customer friendly and helpful. PWSA administration should work to be included with ALCOSAN's Clean Water Assistance Fund, which is only available for sewer customers and consider a similar fund for PWSA water customers.

90 Day Delinquent Accounts Test

The sample of 200 accounts that were 90 days past due was sent to Jordan Tax Service with a request as to what was the status of each account. In other words, the auditors wanted to find out if the customer was on a payment plan, if the account was paid in full, or if the property had been liened and/or up for Sherriff's sale.

Finding: Jordan Tax Service would not provide any information about the status of delinquent accounts to the auditors because of an ongoing lawsuit filed by customers in 2016.

Test Alternative

Because Jordan Tax Service would not provide delinquent account information, the auditors had to find another way to analyze the status of these past due accounts. A sample of 40 of these properties was chosen randomly to have their September through December 2015 billing statements printed from PWSA for review. One account was a City of Pittsburgh property so it was eliminated from the sample.

Of the 39 accounts 18 were shut off with only 1 account having their water service reinstated during this time. The remaining 21 were on a payment plan with PWSA. When a customer is on a payment plan the water remains on.

Finding: Almost half of the accounts in the sample did not enter into a payment plan and had their water remain off.

Finding: Bills continue to be issued to terminated accounts for ALCOSAN sewage treatment costs.

Recommendation: PWSA should not bill for sewage usage if the water is shut off; if water is not being used then sewage is not being used.

According to the senior customer service manager, once PWSA turns an account over to Jordan Tax Services, PWSA no longer follows the status of the past due account. Jordan Tax submits the percentage of collections received to PWSA every 2 weeks.

Recommendation: PWSA should track the status of past due accounts with Jordan Tax Services.

Water Exoneration Board

Finding: Despite being revamped in December, as of August the Water Exoneration Board does not have a full complement of members.

Finding: Property acquired by governmental agencies for the purposes of development may have their charges exonerated.

Recommendation: PWSA should work more closely with City officials to develop a similar system to deal with condemned properties. When a property is condemned and a contract offered to have it razed, past due records at PWSA should be exonerated as well. This will enable billing system records to more accurately reflect past due accounts versus having accounts on the books for properties that have not been in existence for many years.

Lead and Copper in Drinking Water

Causes of Lead in Water

Exposure to lead and copper in drinking water can cause serious health problems in adults and children. PWSA water is lead-free when it leaves the treatment plant. The main problem with lead infiltration occurs when water travels through the main lines and the service lines that branch off from the main line to the house.

The best way to prevent lead from leaching from water lines and home plumbing systems is to remove lead lines completely and replace them with copper or plastic/PVC lines. In Pittsburgh, the service line to the homeowner's curb stop box is owned by PWSA. The service line from the curb stop box to the house is owned by the homeowner. It is the responsibility of each party to inspect and replace their plumbing in the pipe distribution system.

Finding: PWSA does not have a complete inventory of all service lines that contain lead.

Recommendation: Eliminating lead in PWSA lines should be a top priority of PWSA's administration and board of directors. PWSA should devise a plan to inspect all lines they own to see which ones are still containing lead. If lead lines are detected in the distribution system, PWSA should plan to replace them as soon as possible.

Recommendation: Households concerned about their water lead level should have their water tested for lead and have their houses and outside service line running from the house to the curb stop box inspected by a plumber for lead piping and replaced.

A less expensive alternative to having lead lines replaced is to have a water filter attached to your main water drinking and cooking faucet. Another alternative is having a whole house filter. Either alternative can be expensive.

Recommendation: PWSA should work with a filtration company to offer discounted filters and filtration systems to its customers. An RFP could be awarded guaranteeing a certain amount of purchases. Also, an RFP could be awarded to plumbing companies that are willing to offer City water customers a discount in replacing a home service line. This way price guarantees could be given to customers willing to spend money on removing lead from their lines.

Lead Regulations

In 1991, the Environmental Protection Agency established a corrosion control treatment regulation called the Lead and Copper Rule to deal with these health safety issues. This regulation requires water systems to control their water's corrosive level, to collect tap samples from homes that might contain lead and establish a maximum safe level of permissible lead. All plans for control corrosion must be approved by the Pennsylvania Department of Environmental Protection (PA DEP) so a permit can be issued.

The lead rule in Pittsburgh is enforced by the Allegheny County Health Department (ACHD) who then reports all findings to PA DEP. In the past the ACHD and PA DEP required PWSA to test a sample of 50 homes for lead every three years.

Corrosion Control Compliance Issues

In July 1995, the PA DEP approved a treatment plant corrosion control plan made by PWSA and issued them a permit requiring the use of soda ash for corrosion control. In April 2014, PWSA decided to switch from soda ash to caustic soda in the water treatment process because of the higher cost of soda ash and an obsolete soda ash feeder. PWSA never notified the PA DEP of the change.

Finding: PWSA violated the Safe Drinking Water Act by changing the type of corrosion chemical used without notifying and obtaining a permit from the PA DEP.

Finding: The PA DEP investigation is still in the preliminary stages and no fine has been issued at this time. However, the violation requires PWSA to take additional steps regarding lead issues.

Management Responsibility

PWSA was under contract with Veolia for management services during the time the switch was made from soda ash to caustic soda. The change was one of Veolia recommendations to save PWSA money. Veolia did not inform PA DEP of the change nor did they inform the board of directors at PWSA.

Recommendation: Action should be taken against Veolia as they were responsible for the change to caustic soda. This management error of switching corrosive chemicals without informing PA DEP or PWSA board of directors should have never occurred. If a fine is assessed to PWSA because of this PA DEP corrosion control permit violation, Veolia should be the one held responsible to pay it, not PWSA.

With input and insistence from the City Controller, PWSA, on October 12, 2016, filed an arbitration law suit against Veolia. *The Tribune Review* reported that the lawsuit was for “creating problems with faulty water meter, and a change in corrosive chemicals”.

PWSA Lead Testing Results for PA DEP

As a result of the PA DEP corrosion control permit violation, PWSA was required to test 100 homes this round of testing. These tests were conducted by PWSA in July 2016.

Finding: In the July 2016 PA DEP sample of 100 homes, there were a total of 17 or 17% of homes that had levels of lead higher than 15 ppb. Four (4) homes had extremely high levels between 50-75 ppb.

2013 Lead Test Result Comparison

Finding: Water samples taken in 2016 show that lead levels have increased since 2013. The change in corrosive agent from April 2014 to January 2016 may be a cause.

PWSA Actions to Prevent Lead in Water

As stated previously lead test results with more than 10% of the sample exceeding 15 ppb is not a violation but requires PWSA to make additional steps. PWSA is complying with the PA DEP requirements in several ways which include: customer education efforts, free lead tests, and the Water Quality Initiative Program.

Customer Education Efforts and Free Lead Tests

Beginning in early 2016, PWSA now sends a “Facts About Lead” information sheet that is included with all customers’ monthly bills. This information sheet gives facts about drinking safe water, dangers of lead, and safety precautions customers can take if they are concerned about their water lead level.

PWSA’s free lead test number is located in both the lead information sheet included with your bill and on PWSA’s website.

The results of the free lead test sample shows that more than half (57%) of the homes tested had no trace of lead in their water. However, 12% of the homes tested had a reading at or above 10 ppb and 20 (5%) of the homes tested had a reading at or over 15 ppb which is considered dangerous and action should be taken.

Lead Testing Results by Neighborhoods

Every free test result in the database received by the auditors had the corresponding address of the home that was tested. The auditors took the addresses and identified which neighborhood they were located in by using a City neighborhood map. The purpose was to see if there was any relationship between the lead readings and the neighborhoods or streets they are located on. **After reviewing the data, the auditors found no correlation between high or low readings and neighborhoods or streets.**

Finding: The free lead test sample shows the complexity of PWSA solving the lead in the water problem; numbers greatly vary on the same street and within the same neighborhood.

Status of the Free Lead Tests

Recommendation: PWSA needs a better approach at promoting the free lead tests and to educate customers on the dangers of the lead in water. The only way to get an accurate picture of the lead levels in Pittsburgh is to encourage every PWSA customer in the City to have their lines tested.

Water Quality Initiative Program

In May 2016, PWSA outlined a Water Quality Initiative Program. The program consists of 8 goals and each month an update on each goal is posted on their website.

PWSA Asset Management Problems

Currently, PWSA uses a Geographic Information System (GIS) mapping software to document water and sewer line repairs/ replacements and their locations throughout the City. In this GIS system, the data is only available beginning with 2011. Prior to 2011, large paper maps were used to look up streets and track water and sewer lines.

PWSA approved the purchase of a business management system also known as Enterprise Resource Planning (ERP) software from Cogsdale Corporation in February of 2010 costing upwards of \$2.7 million.

The last discussion found by auditors about the ERP software was in 2013 by a PWSA board member. According to this PWSA board member, “The system is only partially online three years after PWSA approved buying it”. This is due to inefficiency in the system. One of the inefficiencies of the Cogsdale software is a lack of a Computerized Maintenance Management System (CMMS).

Finding: As of the end of August 2016, the authority does not have a CMMS.

In 2011, the City and Allegheny County purchased a joint license for a JD Edwards (JDE) ERP system. By the City being a co-licensee, the City's component units (authorities) would be able to join the City's system at a far lower cost than if the authority would purchase an ERP system on their own. This option was presented to PWSA, however, they decided to go in another direction, despite the cost savings from the already purchased software.

PWSA's management is currently researching CMMS options available. One option being explored is a module in the COGSDALE system that is similar to a CMMS.

Recommendation: PWSA needs a CMMS to improve their asset management capabilities and accuracy.

Negley Run Watershed and the Washington Boulevard Flooding

The Negley Run Watershed consists of approximately 3,550 acres of land in several eastern neighborhoods in the City and surrounding towns that currently drains into two trunk sewer lines under Washington Boulevard. As combination type sewers, these pipes carry both sanitary and storm water.

With the increase of development in the area that makes up the watershed and the elimination of impervious ground, additional water is flowing into the Washington Boulevard area during wet weather. However, the capacity of the sewers under Washington Boulevard have not been able to handle this amount of water, causing severe flash flooding which resulted in the death of four people in August 2011. In 2012 PWSA hired MS Consultants to study various options to address the flooding.

Washington Boulevard Flood Gates

PennDOT installed a system of gates at Washington and Allegheny River boulevards, Washington and Negley Run boulevards and Washington and Highland Drive in October 2011. These gates were designed to drop and prevent cars from entering the area. The system cost approximately \$400,000 to install.

In July 2016 one of the arms of the gates on Washington Boulevard was damaged after being hit by a vehicle. This gate was not repaired or functioning during another severe storm in August 2016. This resulted in two cars being stranded in the water. The broken gate was not repaired as the ownership and maintenance responsibilities had not been defined between the City and the State. The City of Pittsburgh now agrees to maintain and repair the gates.

Finding: Despite spending money on the MS Consulting report about suggestions to correct the flooding issue at Washington Boulevard, PWSA has no plans to act on its reconfiguration.

Cost of Emergency vs. Contract Repairs

Finding: PWSA is unable to supply documentation about the cost of emergency repairs vs contracted repairs. While common sense dictates that properly bid out repairs should cost less than emergency repairs, data should be available to substantiate the claim.

Recommendation: PWSA needs to establish a realistic comprehensive line replacement plan of action for both water and sewer lines. A map needs to be made where the most recent emergency repairs have been needed in order to determine a pattern of failure and with that determination plans for future line replacements.

Cooperation with the City Department of Public Works Permit Division

Finding: In fact it was noted that a major construction job in Oakland took place and by the time PWSA was asked to review the plans the job was already completed. In this particular instance the water lines were located extremely close to new electrical lines. Despite this safety hazard PWSA was helpless to make the contractor change the design because the City's Department of Public Works Permit Division had already approved the plans.

Recommendation: PWSA and the City of Pittsburgh's administration must work together to approve new development projects. Between the PWSA board of directors and City council the process must be changed to require input from PWSA's engineers on all blueprints. PWSA might consider scheduling an engineer to review new plans once or twice a week at the City's permits counter.

PWSA's 40-Year Plan

This 40-Year Plan is a guide for the capital improvements that PWSA will need to complete over the next 40 years along with estimates for the financial resources needed to complete the projects.

During a meeting with PWSA staff, the auditors were told that the 40-Year Plan does not serve as an actual plan for decisions that are made by PWSA. The staff stated that the plan was more like a "wish list".

Finding: The 40-Year Plan report is not being used by PWSA.

Finding: In order to replace PWSA's entire infrastructure it will cost a minimum of 2.5 billion dollars and much more at 2017 construction costs.

Finding: Some infrastructure work has been completed over the years but PWSA lacks documentation to show when, where and what has been fixed.

Recommendation: As previously recommended, PWSA needs a Computerized Maintenance Management System (CMMS) to improve their asset management capabilities and accuracy. PWSA administration needs to make this a top priority.

Sincerely,



Michael E. Lamb
City Controller

INTRODUCTION

This performance audit of the Pittsburgh Water and Sewer Authority (PWSA) was conducted pursuant to section 404(c) of the Pittsburgh Home Rule Charter. This audit assesses the authority's billing, delinquency and exoneration process and procedures; evaluates customer service effectiveness; investigates and assesses the new wireless meter-interface unit installation; evaluates the computer software systems used for billing, delinquency tracking, and infrastructure asset management; reviews overall finances, emergency requests and cost of construction vs. emergency repairs.

This audit also examines the concerns about lead in PWSA drinking water, procedures for preventing lead in drinking water and the cost savings and effectiveness of hiring private contractor Veolia Water North America – Northeast, LLC, (“Veolia”) in managing the authority.

A prior performance audit completed in 2006 examined the use of the City's sewer system by other municipalities without user fees or enforcement of existing sewer maintenance agreements. In 2010, another performance audit examined the authority's procurement practices, delinquency and exoneration procedures, water treatment effectiveness and customer service accessibility.

OVERVIEW

The Pittsburgh Water and Sewer Authority (PWSA) was created in 1984 under the *Pennsylvania Municipality Authorities Act of 1945*. The authority's primary purpose at that time was to oversee a \$200 million capital improvement project to refurbish the infrastructure of the City's entire water system, water treatment plant and distribution system. Covering the City's 3 reservoirs (2 at Highland Park & 1 at Lanpher) was also required to meet the federal and state Safe Drinking Water Acts.

Only 2 of the 3 reservoirs were covered because the Highland Park community objected to their reservoir being covered. The Highland Reservoir 1 serves as a recreational focal point of Highland Park. Consequently, at an additional expense to PWSA, the Highland Reservoir 1 had to have a membrane filtration plant constructed to treat the drinking water.

In 1995, the City's Water Department was sold to PWSA for \$96 million. A capital lease/sale agreement arranged 3 installment payments from PWSA to the City due as follows: \$35 million in 1995, \$40 million in 1996 and \$21 million in 1997. All City Water Department employees were transferred to PWSA. The authority became responsible for producing and supplying water along with maintaining and operating the water and sewage infrastructure.

According to PWSA, the authority supplies water to approximately 83,000 customers and services 113,000 sewage customers with sewer conveyance and billing. The Borough of Millvale's water system is part of the PWSA billing and servicing responsibility. However, Millville's sewage system is not.

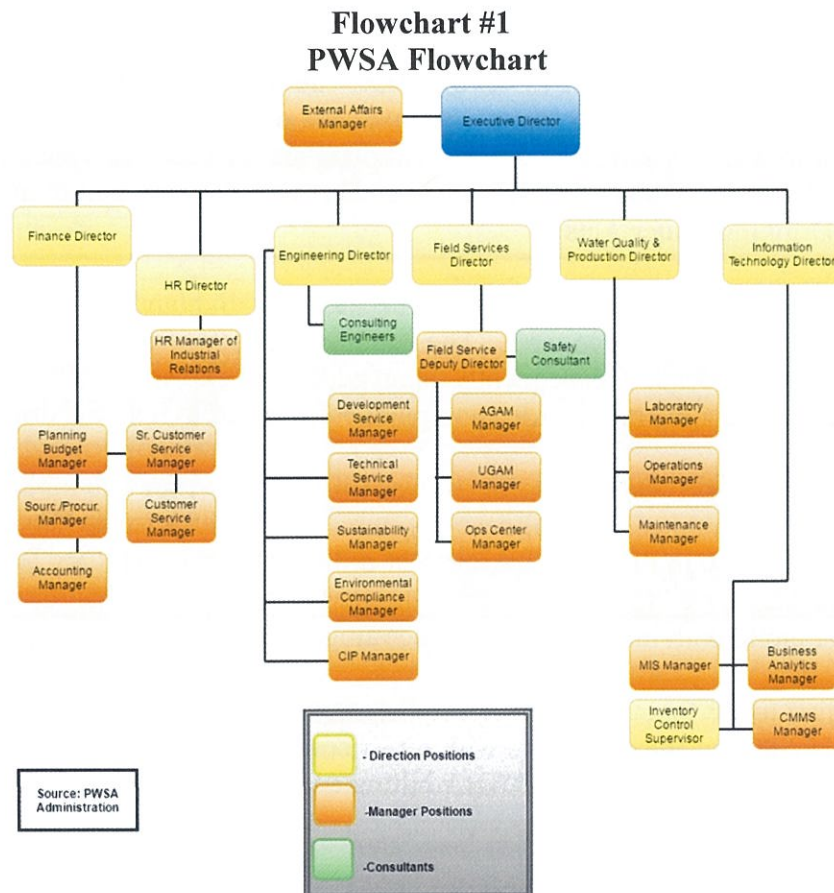
The authority also sells bulk water to Reserve Township, Fox Chapel Authority, and Aspinwall Borough. When needed, PWSA has agreements to supply water to Pennsylvania American Water, the Municipal Authority of West View Borough, the Hampton Shaler Municipal Authority and the Borough of Sharpsburg. Expanding water availability and service to outside communities is one of the future goals of PWSA.

The authority’s drinking water system consists of 3 reservoirs, 2 water treatment plants, 11 pumping stations, and 11 storage tanks along with approximately 1,000 miles of water lines. The sewer system comprises 4 booster pumping stations and approximately 1,200 miles of sewer lines.

Organizational Chart

PWSA is governed by a seven-member board of directors appointed by the mayor for 5 year terms. As stated in the City’s Home Rule Charter, board members serve at the will of the Mayor.

The board meets monthly to discuss policy and to vote on resolutions. These meetings are open to the public. The board makes all policy decisions regarding financial, operational and administrative procedures. PWSA’s executive director is responsible for implementing the board’s authorizations and overseeing the authority’s day-to-day operations. The following flowchart illustrates PWSA’s current organization.



PWSA's organization chart includes communications, customer service, finance, budget planning, sourcing/procurement, human resources, information technology, management information systems, inventory control, business analytics, and the Computerized Maintenance Management System (CMMS). These functions are under 6 major departments: Finance, Human Resources, Engineering, Field Services, Water Quality and Production and Information Technology.

The Finance Department is responsible for developing the budget, procurement, accounting and customer service. Customer service is responsible for all of PWSA's billing (water and sewer), the telephone center and handling customer problems, metering and collections. Dispatch responsibilities are under customer service; however it is not listed on the organization chart.

The Human Resource Department is responsible for managing all aspects of employee personnel: hiring, firing, workers compensation and benefits.

According to the PWSA website, the Engineering Department is responsible for administering the capital improvement program and support operations. This includes the Combined Sewer Overflow and Sanitary Sewer Overflow directives enacted under federal, state, and county health organizations and the Allegheny County Sanitary Authority's (ALCOSAN) Consent Decree. The department also offers assistance with the public's sewer tap-in applications and resolves emergency repairs to water lines due to acts of nature, excavation accidents or aging pipes.

The above-referenced consent decree is an agreement between ALCOSAN, the United States Environmental Protection Agency (EPA), the Pennsylvania Department of Environmental Protection (DEP), and the Allegheny County Health Department (ACHD). It was enacted for ALCOSAN to achieve compliance with the Clean Water Act during periods of wet weather.

The Field Services Department was recently modified. It has an Above Ground Asset Manager (AGAM) who supervises crews that repair work such as catch basins, plumbers doing shut offs, meter problems and pump stations. An Underground Asset Manager (UGAM) supervises crews that work on underground assets such as water lines and sewer lines. There is an Operations Center Manager that falls under the UGAM.

The Water Quality and Production Department is located at the water treatment plant. The water treatment plant is located on the Allegheny River near Aspinwall. The plant supplies water to customers, maintains water quality, and provides waste water services. Plant operations treat, analyze, store and deliver over 70 million gallons of water per day and maintain and operate over 1,200 miles of water lines and 1,100 miles of sewer lines 24-hours a day, 7 days a week.

According to PWSA, the authority is investing \$655 million for infrastructure improvements including environmental mandates to ensure clean, safe drinking water. The board of directors approved a 2 year rate adjustment to fund these improvements. As of January 1, 2017, the average residential customer saw an increase of 23 cents per day or \$6.90 per month.

The Information Technology Department includes a Management Information System (MIS) manager who oversees the computer support operations, an Inventory Control Supervisor, a Business Analytics Manager and a CMMS Manager. CMMS is a software system that tracks and documents water and sewer line locations, repairs, and installations. Currently, PWSA is without such a system but it is included in the organizational chart for future use along with network management, help desk support, database and software management and telecommunications support functions.

PWSA Personnel

PWSA's policy requires all employees to be domiciled in the City of Pittsburgh. The authority's 254 employees are distributed within its organization as follows:

The water treatment plant has 35 employees plus 4 working in the lab. The administrative offices on Penn Avenue has 40 customer service employees, 22 engineering & construction employees, 12 administration employees, 8 MIS employees, 7 finance/procurement employees, and 5 dispatch employees.

Individuals are also employed at satellite pump stations, storage facilities, plumbing centers, and operation yards located throughout the City. These locations are the Brilliant Yard located off of Washington Blvd with 57 employees; Howard Street in the Northside with 36 employees; Mission Yard on the Southside with 24 employees; and the Warehouse in the Strip District with 4 employees.

According to PWSA's *2012 Highlights*, Mission Yard was a pilot operation conducted by PWSA and involved the movement of two water crews from the Brilliant Yard to work with the sewer division at the Mission Yard. Doing this improved response time in servicing Southside customers with water and sewer problems. It also saves the authority money on fuel and equipment.

Sewage Conveyance to ALCOSAN

PWSA is responsible for sewer conveyance throughout the City of Pittsburgh. The sewer system is composed of 1,200 miles of sewers and more than 25,000 catch basins. The sewer collection system is primarily a combined collection system. That is, sanitary sewer flows and storm water flows are combined into a single conveyance pipeline. All parts of the PWSA collection system go to ALCOSAN's interceptor system for treatment.

PWSA bills on behalf of ALCOSAN for sewage treatment for all PWSA customers and Pennsylvania American Water customers who live in the City. Sewage charges are based on water usage. ALCOSAN announced a 4-year rate structure to pay for upgrades to facilities to meet demand and for compliance to environmental mandates. Effective January 1, 2014, the sewage treatment rate rose 17%, increasing the average monthly bill by \$4.19.

It is PWSA's responsibility to pay ALCOSAN for sewer usage whether or not the customers pay their bill.

OBJECTIVES

1. To assess the billing, delinquency and exoneration process, procedures and problems.
2. To evaluate customer service effectiveness.
3. To investigate and assess the new wireless meter-interface unit installation and water usage tracking.
4. To examine the water treatment and delivery process.
5. To assess staffing changes especially in leadership and legal counsel.
6. To determine the cost and effectiveness of hiring Veolia, contract language and contract incentives.
7. To document and identify asset management problems and procedures and to gauge the status of the 40-Year Plan of 2011.
8. To identify the status of delinquent City owned property water bills and the payments made to PWSA.
9. To report the current and past procedures in place for examining lead levels in Pittsburgh's drinking water and prevention strategies.
10. To explain the current exoneration board status and process.
11. To explain water subsidy payments from PWSA to PA American Water (PAW) and the authority's role in collecting PAW sewage charges.
12. To explain the Negley Run Watershed and Washington Boulevard Flooding and recommendation as per the consultant's report.
13. To make recommendations for improvement.

SCOPE

The scope of this performance audit includes 2015 delinquent bills; meter installation for years 2014-2016; lead content in water for years 2013-2016; Veolia contract from 2012 to December 31, 2016; legal costs from 2014 and 2015; customer email correspondence from June to December 2015; Pennsylvania American Water subsidy from 2012 to 2015; City payments to PWSA in 2015; Washington Boulevard 2012 consulting report; and PWSA's 40-Year Plan from 2011.

METHODOLOGY

The auditors met with the executive director, finance director and financial analyst to review operations and discuss the authority's various procedures, departments and issues.

A tour of all administrative offices located at 1200 Penn Avenue was conducted with an overview of operations. The customer service call center was observed with procedures and processes explained and clarified.

Auditors interviewed the Senior Manager of Customer Service who oversees the customer service contact center and billing operations. The Assistant Director of Collections who manages the delinquency accounts was also interviewed and provided us with delinquent account data.

The collection agency for delinquent accounts, Jordan Tax Service, was contacted and interviewed over the telephone and information was communicated through email.

A customer service telephone survey was conducted from March 7-April 1, 2016. Auditors made random telephone calls daily during customer service hours of 8:00 am through 6:00 pm Monday through Friday. This was to determine wait time. A total of 70 calls were made.

Internet research was performed on the issues experienced by other water systems related to automated meters and lead problems.

The auditors reviewed and analyzed the following documents: Jordan Tax contract, payments and collections for 2014 and 2015; agreement with Pennsylvania American Water Company; Request For Proposal (RFP) of new customer service telephone system; customer service fourth quarter 2015 reports and statistics; database of aging reports (delinquent accounts) for 2014 and 2015; total customer database; Excel spreadsheet of PWSA billing emails; Veolia contract & payments; monthly Dashboards or statistics on PWSA's performance; key performance indicators (KPIs); Cooperation Agreement between PWSA and the City of Pittsburgh; monthly Executive director's reports for 2014 and 2015; and meter interface device contracts/agreements with Landis+Gyr and Sensus.

The City's OnBase and JD Edwards programs were used to review accounts and checks sent to PWSA by the Controller's Office.

The auditors conducted additional internet research and read and reviewed numerous newspaper articles about PWSA billing problems, management issues and equipment failures.

Auditors toured the PWSA water treatment plant on March 16, 2016.

Auditors met with the Advanced Meter Infrastructure Project Manager who conducted a presentation on the water usage compilation and data gathering process.

The 2016 results from the free homeowner lead test kits provided to City customers were given to the auditors in an excel spreadsheet. All other information regarding exposure to lead in water and lead testing were obtained online from the Department of Environmental Protection, Environmental Protection Agency and PWSA websites as well as various newspaper articles. Documents reviewed on PWSA's website included: the Annual Drinking Water Quality Reports from 2014 and 2015, the lead facts and testing information section, board of director minutes, executive director's reports, and the 2016 PADEP Administrative Order. Also reviewed were water bill inserts sent to PWSA water customers.

Auditors met with the Director of Engineering, Field Services Director, Information Technology Director and various other managers and personnel to explain operations, capital improvement plans, and asset tracking procedures. These tracking procedures are used to document new water and sewer lines throughout the City. An explanation of emergency procedures was also presented.

Review of the 2012 MS Consulting, Inc. report titled *Final Report for Negley Run Watershed / Washington Boulevard*. Review of the *City Code Chapter 330* and PWSA's *Rules and Regulations of the Pittsburgh Water and Sewer Authority, Customer Rights and Obligations*.

FINDINGS AND RECOMMENDATIONS

The Pittsburgh Water and Sewer Authority (PWSA)

The scheduling of this PWSA performance audit ran concurrently with widespread problems with customer billing charges and usage readings. These problems resulted in a public outcry and the authority being sued by some of its water customers. Complaints reached the members of Pittsburgh City Council who requested immediate intervention. These problems occurred under the hired water management services organization called Veolia Water North America – Northeast, LLC (hereafter known as “Veolia”).

For a number of years prior to the hiring of Veolia, PWSA was having difficulties. According to a July 2013 article in the Pittsburgh Post-Gazette, PWSA problems included a third of customer service calls not being answered; a conflict of interest with the executive director and the hiring of a utility insurance company; and flooding in the East End of the City at Washington Boulevard. This situation resulted in high employee turnover including the resignation of that executive director.

The PWSA board recognized the need for a long term management plan that would provide stability and consistency for the authority. With that need in mind, the authority advertised a Request for Proposal (RFP) looking for an established water management company whose work and experience would provide PWSA with a long term management plan. As a result the authority hired Veolia.

Veolia Interim Management Services Contract

PWSA contracted with Veolia to provide “executive management services, general administration and management consulting services, and financial and infrastructure management consulting services to the authority”. PWSA’s board of directors signed 3 contracts with Veolia over 3.5 years.

The first contract was for a term of one year and was signed on July 12, 2012. The second contract had a term from July 15, 2013 through December 31, 2014. The final contract term began January 1, 2015 and ended December 31, 2015. The final contract included two six month automatic extensions unless PWSA gave a ninety day termination notice before the end of the term or additional term. At the end of December 2015, the Veolia contract was not renewed.

Contracted Terms of Compensation

The Veolia contract provided 3 areas where the contractor could receive compensation, 1) base salary, 2) key performance indicators (KPIs) and 3) recognized cost savings or improvement initiatives. Each contract included a base monthly salary. For the first contract year the monthly base salary was \$150,000. During the next 2 contracts, the amount varied but was never less than \$100,000 a month. The amount varied depending on successful appointment of an interim executive director, in 2012 appointing a study manager,

interim chief operating officer and in 2014 appointing an interim finance director. The appointment of the interim employees was to be hired by Veolia, but paid by PWSA.

In addition to the base salary, Veolia received compensation for developing KPIs. KPIs developed by Veolia were agreed upon by the PWSA board of directors and once implemented and completed; these KPIs resulted in additional monies being paid to Veolia.

Finally, Veolia received 40% of recognized cost savings from “improvement initiatives”. (OpEx [short for Operating Expense] in Table 1) As per the contract, “Veolia and the authority will work jointly to evaluate opportunities for efficiencies and where potential improvements are identified [“improvement initiatives”] they will submit business case reports to the steering committee for approval”. In other words the improvement initiatives were procedures that were established with board approval. Veolia is being paid for “improvement initiatives” through December 31, 2016.

This steering committee was formed by agreement between PWSA and Veolia. PWSA designated three members while Veolia designated two. If a member of the committee would be unable to fulfill their duties, the party that designated that member would be allowed to designate a replacement. The steering committee oversaw the services that Veolia agreed to perform including Veolia management appointments within PWSA.

The total dollar amount of payments made to Veolia as of April 8, 2016 can be found in Table 1.

TABLE 1

PWSA PAYMENTS MADE TO VEOLIA DURING CONTRACT YEARS 2012-2015					
	2012	2013	2014	2015	TOTAL
Management Fees	\$949,003	\$1,905,265	\$1,620,000	\$980,000	\$5,454,268
KPIs	\$51,000	\$399,000	\$270,000	-	\$720,000
Opex	-	\$756,469	\$2,518,922	\$1,565,095	\$4,840,486
Other	-	\$1,788	\$(4,902)	\$(5,115)	(\$8,229)
TOTAL	\$1,000,003	\$3,062,521	\$4,404,020	\$2,539,980	\$11,006,525

Source: PWSA

Finding: PWSA board of directors paid Veolia over \$11,000,000 during the 3.5 year contract.

Continuing Payments to Veolia

Veolia, as per the contract, should have received a percentage of all “improvement initiatives” savings until December 31, 2016. As of October 2016, PWSA had \$1,307,851 in

RECOMMENDATION NO. 1:

PWSA board of directors should insist that contract provisions are followed. KPIs should be clear measurable goals, rather than an outline of a list of tasks to be completed by a contractor.

Recognized Cost Savings or Savings from “Improvement Initiatives”

The 3rd means of compensation for Veolia was being paid a percentage of any cost savings. These cost savings were not explained or outlined in the contract. Improvement initiatives were presented to the steering committee for approval and if approved, then submitted to the board for approval, rejection or modification. The idea was to share savings in the authority’s cost structure from initiatives that Veolia identified. The intent changed from cost savings to any cash flow improvement identified by Veolia, including both cost savings and revenue enhancements.

The following is a list of improvement initiatives that Veolia negotiated and for which they were paid. This list was supplied and explained by the PWSA director of finance.

TABLE 3

VEOLIA IMPROVEMENT INITIATIVES	
Improvement Initiative	Description
1. Fire Service Line	The revenue increase resulting from billing fire service line accounts (Lines provided mainly to non-residential customers to service their fire suppression systems. These systems are metered separately).
2. Win Back Large Customer	The revenue increase resulting from getting large customers to resume water service from PWSA.
3. Reduce Filter backwash	The cost savings from reducing the frequency of flushing the filters in the water treatment plant.
4. Increase Filter Run Time	Not used
5. Membrane Plant Optimization	The cost savings from changes in staffing and operation of the membrane plant.
6. Make vs Buy: CCTV	The cost savings from purchasing a CCTV truck to televise sewer lines. This service was previously contracted.
7. Sourcing of Chemicals	The cost savings from undertaking more competitive bidding procedures to procure chemicals
8. Laboratory Efficiency	The cost savings from reduced staffing at the lab and optimizing operations.

TABLE 3 (continued)

Improvement Initiative	Description
9. Large Meter Replacement	The revenue increase from replacing old meters on large accounts with new meters. (new meters are more accurate)
10. Make vs Buy: PA 1-call	The cost savings from bringing 1-call services in house.
11. Warehousing	An adequate description was not given
12. AMI Rebid	Not used
13. PMIS	Not used
14. Make vs Buy: M/WBE	The cost savings from tracking M/WBE compliance in house.
15. Make vs Buy: MS4 Stormwater	The cost savings from reporting MS4 compliance in house
16. Make vs Buy: Compliance Management	The cost savings from monitoring and ensuring regulatory compliance.
17. Make vs Buy: Backflow prevention	Not used
18. Make vs Buy: Backflow prevention	The cost savings from performing hydrant tests in house.
19. Copper-free Algae Treatment	The cost savings from switching copper-based algaecides to copper-free algaecides.
20. Energy Load Curtailment	The cost savings from managing energy usage to minimize coincident load factors, reducing power costs.
21. Sourcing of Uniforms	Not used
22. Sourcing of MIU disposal	The cost savings from of disposing of MIUs that were replaced with newer MIUs.

Source: PWSA

The auditors asked if Veolia needed DEP permission to reduce the frequency of backwashing the membrane filter. PWSA stated that “This is a question for our plant operators and regulatory personnel. I will pass your question along.” The auditors also asked if the DEP had to be notified about the switch to copper-free algae treatment. The finance director stated “I will pass this along to those who know”.

To date no answers to the auditors question or details about the improvement initiatives have been given to the auditors.

Also asked was the number of reduced staff for initiatives number 5 and 8. A \$12,000 savings and the elimination of one position was mentioned.

Finding: A list with explanations of the improvement initiatives paid to Veolia is not available. This is an example of the effects of disjointed leadership which will be discussed later in this audit.

Effectiveness of the Veolia Contract

Initial impressions of the Veolia contract appeared to have good checks and balances. The reality is that the board of directors and the steering committee are only volunteers or employees that Veolia hired serving part time on the steering committee. This makes it difficult to monitor the impact of KPIs or improvement initiatives on a daily basis. Hiring an outside firm to operate a \$174,000,000 authority and paying them a percentage of cost savings allows a potential conflict of interest.

Finding: The day to day operations are presented to the board of directors by the managers and because of allegiance to Veolia, their representation can be skewed.

RECOMMENDATION NO. 2:

The PWSA board should avoid hiring companies to manage the authority that require a percentage of cost savings. Agreements like this promote the company's profits over the competent operation of the authority. It would be in PWSA's best interests to hire employees whose allegiance is to PWSA and its efficient and effective operations.

Changes in Leadership

PWSA experienced many leadership changes throughout the years, from key managers to executive directors. The Veolia contract was not renewed for 2016 and the interim executive director under Veolia was appointed as the permanent PWSA executive director by the PWSA board. That executive director resigned on March 3, 2016. Shortly following that resignation, an interim executive director was hired for a 6-month period.

This interim director became aware of the lack of data transparency within the authority and made changes to improve it. He stopped employees from changing computer software; that software would solve one problem but create more problems. He also implemented procedures requiring customer service staff to pull and investigate high consumption bills.

The initial board-appointed interim executive director had to be replaced after 6-months due to a prior commitment. The PWSA board of directors hired another interim executive director for another 6 months on September 12, 2016. This current interim executive director is an army retiree and an ex-Army Corps of Engineers' employee. The PWSA Board's long term plan is to appoint a permanent executive director and as of September 1, 2016 the search is underway.

Each change in leadership brings a learning curve. The staff must adjust to a new personality and a new way of doing things. This lack of consistency in an organization can cause confusion and frustration among employees, customers and the organization as a whole.

Other positions within the authority have had numerous management changes as well. The engineering director has been the acting with the authority as of December 2015. Additionally, the technical service manager has been affiliated with PWSA for over 20 years, serving as a consultant before being hired full time. During his tenure there have been 12 different engineering directors and 13 different executive directors. These turnovers provide inconsistent leadership, which leads to inefficient strategic planning in all areas of operation throughout PWSA.

Finding: During the course of this audit, 3 different people were in charge of the day to day operations of the authority. Frequent leadership changes make an organization inefficient and interfere with planning strategies to overcome daily problems.

RECOMMENDATION NO. 3:

The PWSA board of directors should work diligently to find an executive director with the knowledge and skills to manage PWSA operations. Employee retention is imperative and the chosen individual should be able to make a long term commitment. Included in this process should be frequent oversight of the current interim executive director.

In-house Legal Counsel

Thirty years ago, City controller auditors sat in on various authority and other public meetings. This included the Pittsburgh Water Department. At that time, an in-house attorney was present at meetings to provide explanation of any legal issues that may arise. PWSA, sometime over the last 30 years, eliminated this attorney or solicitor position and outside legal counsel was hired.

During the audit period, PWSA did not have a solicitor on staff. Most of the general legal services were provided by Clark Hill Thorp Reed. The fees PWSA paid to these various firms as well as the type of cases each firm handled can be found in Table 4.

TABLE 4

2014 AND 2015 PWSA OPERATING LEGAL COSTS			
LAW FIRM	TYPE OF CASES	2014	2015
Clark Hill Thorp Reed	General	\$1,238,490.58	\$1,128,406.99
Caputo & Caputo, P.C.	Statutory appeals/exonerations	\$3,422.50	\$22,281.23
Thomas, Long, Nieson & Kennard	Professional Services	\$20,540.32	\$0.00
Buchanan Ingersoll & Rooney PC	Professional Services	\$9,000.00	\$8,896.00
Pepper Hamilton LLP	---	\$0.00	\$0.00
Winston & Strawn LLP	---	\$0.00	\$0.00
Gaul Legal, LLC	Professional Services	\$2,725.00	\$0.00
Aqualaw	Consent decree/ storm water	\$0.00	\$38,338.62
Mcnees Wallace & Nurick LLC	Finance and bond		\$93,684.83
TOTALS		\$1,274,178.40	\$1,291,607.67

Source: PWSA

Finding: Attorney fees for general counsel in both 2014 and 2015 cost the authority over \$1,200,000 a year.

RECOMMENDATION NO. 4:

The authority needs to hire an in-house general counsel solicitor. This person should offer support, protect the authority and be directed to handle most legal matters.

When the first interim executive director was hired he noticed the elimination of the internal solicitor position from the PWSA budget. He made a recommendation to the PWSA board to re-establish the position. The authority hired an in-house legal counsel in October 2016 at a salary of \$108,000 a year. The amount of cost savings is currently unknown because PWSA still retains Clark Hill Thorp Reed as general counsel.

General Solicitor

PWSA believes that retaining the services of Clark Hill Thorp Reed is necessary because of the volume and specialty nature of the work. Currently, the legal counsel believes that an entire PWSA law department would be needed if the board wanted to eliminate the general solicitor. An analysis of the work load and what the general solicitor charges is beyond the scope of this audit.

RECOMMENDATION NO. 5:

The PWSA board of directors and management need to review legal costs and work toward their reduction.

Water Treatment Plant and Process

PWSA's water treatment facility is located within the City boundaries along the Allegheny River near Aspinwall. PWSA's entire water source is drawn from the Allegheny River. This is a great asset because the Allegheny River, 1 of the 3 rivers of Pittsburgh, offers the cleanest water.

Currently, the average daily draw of water from the river is 70 million gallons with a 100 million gallons daily maximum. Once the water is pulled from the river, it takes three days to process. This occurs in four separate stages: coagulation, sedimentation, filtration, and disinfection.

The first stage of the treatment process is called coagulation. During this step, chemicals are added to the water. Lime is added to adjust the water pH, potassium permanganate is added to oxidize organics in the water and coagulants are added which clumps together particles called “floc”. The floc settles to the bottom of the treatment pools and is removed by gravity. This is called sedimentation.

Once the floc has settled to the bottom of the pools, the clear water will pass through the filtration stage. Here the water flows through a series of filters comprised of charcoal, sand, and gravel in order to remove any dissolved particles and microorganisms, such as bacteria and parasites. Finally, the water is disinfected with chlorine to remove any remaining harmful microorganisms. Sodium carbonate (or soda ash) is added to adjust the pH of the water, which helps to slow down the lead corrosion of water pipes and carbon is added to sweeten the taste of water. Fluoride is also added for cavity prevention.

The water is then pumped to one of 3 main reservoirs in Pittsburgh before it is distributed to retail customers. Two (2) of the reservoirs are located in Highland Park. They are Highland Reservoir #1 and Highland Reservoir #2. Highland Reservoir #1 is an open-air reservoir which requires the additional treatment of a microfiltration plant. In an open-air reservoir, the water must be retreated by membrane filters and chlorinated again to remove any impurities that may have entered the water while being held in open storage. The third reservoir is called Lanpher, located in Shaler Township.

PWSA Water Treatment Regulations

The main regulatory body of PWSA is the Allegheny County Health Department (ACHD) which reports to the Pennsylvania Department of Environmental Protection (DEP). The DEP and the Environmental Protection Agency (EPA) regulate the amount of certain contaminants allowed in water provided by public water systems. PWSA tests and monitors all water 365 days a year for contaminants at the Aspinwall Treatment Plant and at the Highland Park Membrane Filtration Plant (Reservoir #1). Tests are done prior and during the treatment process as well as on finished water.

Test Results for Contaminants at Treatment Plants

Until the high levels of lead were found in Flint, Michigan in 2016, concern about acceptable levels of contaminants, such as lead in water, was of limited interest to water customers. Water systems only have to report levels higher than the EPA action levels. Since the problem with Flint’s water, purity and lead content has become a major concern to customers.

In 2014 and 2015, PWSA tested for 100 different contaminants in their water. Results of the tests are sent to the DEP and EPA and customers can access the results through PWSA’s *Annual Drinking Water Quality Reports* posted on the PWSA website. A copy of the report can also be requested from PWSA customer service.

According to PWSA's 2014 *Annual Drinking Water Quality Report*, PWSA found 12 detectable levels of contaminants at the Aspinwall Treatment Plant and 6 at the Highland Park Membrane Filtration Plant. In the 2015 *Annual Drinking Water Quality Report*, 12 detectable levels of contaminants were also found at the Aspinwall Treatment Plant and 5 were detected at the Highland Park Membrane Filtration Plant. All levels of contaminants were within the allowed ranges by the federal and state governments.

Finding: All the contaminants found at the two treatment plants were below federal and state contaminant levels for 2014 and 2015.

RECOMMENDATION NO. 6:

PWSA should write on every customer's bill that water quality reports can be viewed online or a copy requested by customer service. If possible PWSA should inform customers what treatment plant their water comes from so that the customer knows which quality report pertains to them.

Customer Water Usage Tracking

The auditors interviewed PWSA's Advanced Metering Infrastructure Project Manager to understand water distribution, tracking and the entire billing process. A customer's water usage begins with a water service line piped into the property from PWSA's main water line located in the street. The water line is connected to a water meter inside the house/property. Each water meter has a register on top of it that "registers" or tracks water usage for that property address. This register is then connected via a wire outside the house/property to a newly installed automatic meter reader device known as an MXU (meter exchange units) box.

This MXU box electronically transmits the water usage amounts to a cellular control tower. This tower relays water usage information to PWSA's data collector, a company named Sensus. There are 4 data collector control towers located throughout the City: Brashear, Squirrel Hill, Garfield and Allentown. This data is then transmitted to a remote network interface (RNI), located at Sensus data centers in Illinois and North Carolina. RNI transfers the water meter usage amounts to a meter data management (MDM) program owned and operated by PWSA, provided by the Harris Companies. The MDM software conducts a "data sync" or type of validation to match the meter readings with the appropriate account number in PWSA's billing system which is Cogsdale also provided by the Harris Companies.

Cogsdale computes the customers' water usage, bill amounts and assembles other billing information and forwards it to a company called Level One who prints and mails all PWSA's customers' water and sewage bills. Sensus, Harris/Cogsdale and Level One are companies under contract with PWSA. Figures 1-3 show a visual illustration of the current billing process, a photo of a meter and a photo of an MXU attached to a meter and register. An explanation of the Sensus contract can be found in the Appendix.

Finding: There are several companies involved with properly billing a PWSA water customer. At each step there is the possibility of an equipment malfunction and/or billing problem.

FIGURE 1
Transmission of customer water usage

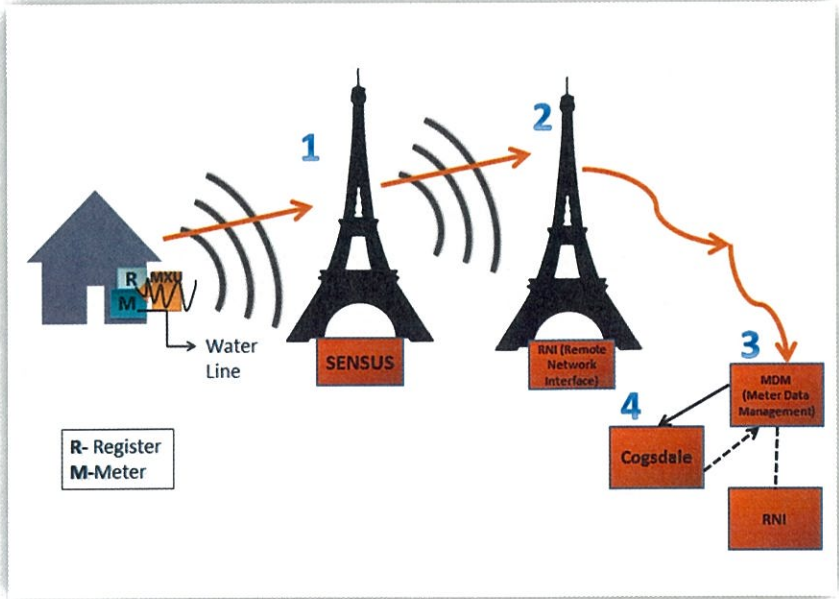


FIGURE 2
MXU attached to Meter & Register

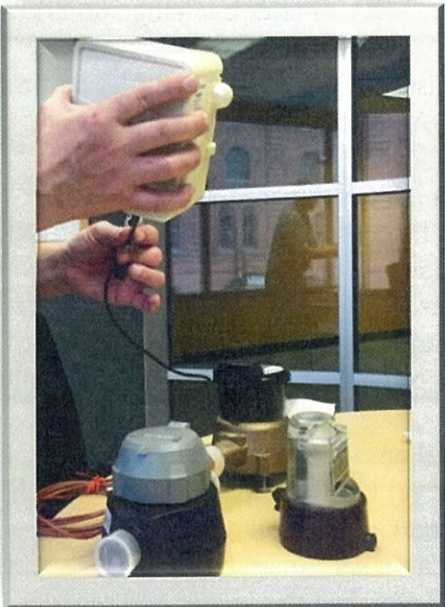
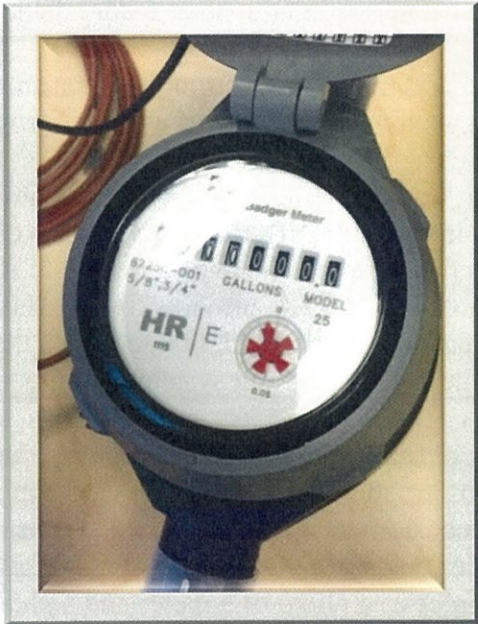


FIGURE 3
Register on top of Meter



Billing Issues

When PWSA's interim executive director was hired billing issues were a major problem. In May 2016, he directed PWSA's billing department to begin reviewing customers' monthly billing information before bills are mailed by Level One. The reviewers look for extremely high consumption rates and/or extremely high water bills. If high water usage is found to be 20% or higher from the last bill, the bill is pulled and investigated. This identifies a potential billing error. This practice helps to ensure that no major mistakes occur before actual customers' bills are mailed out by Level One.

The review of bills before mailing is a common practice among utility companies. For example, Peoples Gas Company follows this protocol for identifying potential high consumption billing problems.

RECOMMENDATION NO. 7:

PWSA administration should continue the practice of reviewing bills for discrepancies before being mailed. This is a practical solution to solving questionable water consumption bills.

The Changes That Lead to Crisis

Three (3) main changes happened concurrently causing several problems for PWSA. The 1st was a change in their billing system from SAP to Cogsdale; the 2nd was a meter reading change; and the 3rd was the multiplier of the mid-size meter change out.

Billing System Change

Before Veolia was hired it was decided that PWSA would change the billing system from SAP to Cogsdale. Using Cogsdale was cheaper than using SAP and provided PWSA with a billing system more tailored to the utility business. During the changeover it was found that Cogsdale experienced incompatible issues with SAP causing transition problems.

A list of the cause and types of problems associated with the change in meter reading equipment can be found in Table 5.

TABLE 5

CAUSES OF BILLING OR USAGE ISSUES	
Incorrect Reading or Discrepancy	No Reading or Data
<ul style="list-style-type: none"> • Water reading multiplier: different types of meters and registers are currently in use, which provide read data in different numerical formats. A multiplier is used to even out these inconsistencies; however, the application of an incorrect multiplier can result in water bills that are 10, 100, or 1000 times the actual reading. These errors vary based on the erroneous data and must be addressed manually. • Estimated bills: if a customer is accustomed to an estimated bill for an extended period of time, once the new MXU has been installed the new water bill may be significantly higher than the previously estimated usage for bills. • Leaky or faulty plumbing: excessive water usage is occasionally attributed to the new MXUs 	<ul style="list-style-type: none"> • Damaged wire or disconnection prevent meter reading from reaching the MXU to be transmitted out: can be caused by rodents, human action or wear of wires. • Compatibility issues between MXU and meters: this included 700-800. Midsized ARB5 meters that needed to be replaced to be used with MXUs. • Damage or removal of MXU boxes by vandals. • Physical obstructions, such as buildings or large vehicles. • Dropped data: due to the extended process of reading the meter to the creation of the bill, some data can be lost during the process.

Source: PWSA

Meter Reading Change

Prior to MXUs, meter interface units (MIUs) were used as the automatic meter readers and were produced by a company called Landis+Gyr. The contract signed with Landis+Gyr included: the MIU units and the AMI (advanced meter infrastructure) used to read those units. An AMI is meant to collect and transmit data from customer site, to the utility data towers and to the data management system (MDM). An AMI is made up of digital hardware and software which allows data measurements through remote communications; allows the measurement of detailed and time based information transmission to various measurement and collection systems.

The Landis+Gyr contract was to expire on September 1, 2014. PWSA wanted to change the terms of the Landis+Gyr contract because the monthly payments were costly, and the contract did not allow PWSA to own their customer service data information. Whenever PWSA required a water report, Landis+Gyr would charge extra.

Landis+Gyr was given the opportunity to lower the monthly price, update equipment and allow PWSA data ownership. Unfortunately, Landis+Gyr would not agree to any

contract changes, so their contract was not renewed. PWSA searched for another vendor and the contract was awarded to Sensus on December 2013.

The Incompatibility Issues

After the Sensus contract was signed, PWSA learned that Landis+Gyr's MIU boxes were not compatible with the new Sensus software. Therefore, all of the old MIU units needed to be switched to MXUs produced by Sensus at a cost of \$19.55 a unit. In preparation for the contract change, PWSA began switching the meters to Sensus's MXUs 6-months prior to the September 1st deadline. When the MIUs were disabled and the MXUs were installed, the reader went offline and an actual reading was no longer possible so homes were mailed estimated readings.

At midnight on September 1, 2014, Landis+Gyr went offline and Sensus's network took over and the reverse happened. Homes with the MXUs now were transmitting water usage readings and the homes with the older MIUs went offline. Actual readings were no longer given and PWSA sent these homes estimated readings.

Finding: If an account has not yet been transitioned to a MXU, any bills received would be based on usage estimates.

Finding: PWSA (Veolia) did not thoroughly investigate for compatible equipment in the Request for Proposal (RFP) that resulted in awarding Sensus the contact.

Finding: Prior to awarding Sensus the new contract PWSA (Veolia) did not require the company to do a test run or pilot program to show equipment compatibility.

RECOMMENDATION NO. 8:

The PWSA administration should require all changes in equipment contracts to run a test or pilot program. Such a test would prove the compatibility of the equipment and eliminate any unforeseen problems and additional costs with the equipment.

MIU to MXU Conversion

The plan to switch MIUs to MXUs was a huge project and Sensus subcontracted with Utility Metering Solutions (UMS) to install the new MXUs. MXU installation was completed in 2015 and the metering group was established to find and correct errors in the installation or data setup of the accounts. The task was to be completed in 3 phases based on meter sizes.

- Phase 1 started with active residential meters (1 inch or less). This was approximately 70,000 accounts.

- Phase 2 involved commercial, industrial and other non-residential buildings. These accounts correspond to midsize meters (1.5 to 2 inch) and large meters (3 inches or greater) for industrial and health and education facilities (hospitals/universities); approximately 435 accounts. Because these meters are larger they are much harder to change out. According to PWSA this phase is in-progress.
- Phase 3 was to deal with accounts that were shut off and/or inactive. As properties were found to be razed, inactive, etc., the bills were removed from the system following a “catch as you go” approach. According to PWSA, this phase has not been reached and these accounts will be addressed upon completion of Phase 2.

Subcontractor Issues

Sensus hired UMS to install the MXUs. This company had several employees change out the MIUs and got the MXU up and running. According to PWSA administration, the process was completed by June 2015, but it turned out that this company did not properly install the equipment. Newly installed MXUs were not reading and transmitting water usage. In some instances the water usage transmitted was excessively high. This resulted in a lot of unhappy customers.

Until the problem became apparent, no one from PWSA checked to see if the contractor was installing the MXUs correctly. After customer complaints, PWSA plumbers went out to inspect the MXUs. PWSA plumbers found wires not attached or wired incorrectly, bad units, and the units not hung correctly. If there is any damage or disconnection of the wire to the MXU, the water readings will not be transmitted.

The solution was to have PWSA plumbers visit homes with inaccurate or no readings and fix the problem(s). This was essentially a duplication of work, costing PWSA more money. For improperly installing MXUs, PWSA is holding back \$163,000 from the contractor. PWSA needs this company for transmission of data and cannot sever ties completely. They are hoping that withholding the money will help them negotiate a fair settlement with the company for the duplication of work.

Finding: PWSA had to pay twice for installation of MXU’s; once to the contractor and another time to the PWSA plumbers who had to correct the problems.

RECOMMENDATION NO. 9:

PWSA administration in future installation contracts should include inspections of completed work. No payment should be made to the contractor without verification that the work was completed accurately.

Billing Problems and Mid-Sized Meters/Register

Billing issues occurred as a result of the switch from Landis+Gyr to Sensus. While improperly installed meters/registers contributed to billing problems, the greatest issue causing bad reading problems was with the multiplier. Over the years PWSA has purchased at least 5 varieties of meters. This is because, as a public agency, contracts are awarded to the lowest responsible bidder; so the type of meter purchased most likely will vary by vendor.

Each type of meter with a register records water usage in a certain way. Some of the registers (the part on top of the meter) on the “midsize” ARB-5 model did not communicate to the MXU properly. This is because of the multiplier associated with the register; some registers read 1 to 1 while other registers read consumption in the power of 10, (x 10, x 100, x 0.1, etc.). In order to get a correct water usage number the reader needs to know how the register is reporting usage and must be programmed accordingly. When programmed correctly a data sync occurs to get the meter/register reading to Cogsdale.

Once again the solution was to have PWSA plumbers visit homes with inaccurate or no readings and fix the problem(s). These meters/registers (ARB-5 model) that are being changed out are between 10-20 years old or older. As of March 2016, approximately 700-800 meters/registers still need to be changed.

Finding: PWSA experienced multiple changes occurring at the same time to complicate billing problems. Not only was the change from Landis+Gyr to Sensus (MXIs to MXUs) causing problems with billing, PWSA switched billing software from SAP to Cogsdale. SAP was not compatible with Cogsdale and caused transition problems. Also, mid-size meter change outs needed to be completed for compatibility with MXU’s and the new system.

Finding: The timing of the decisions made by PWSA caused it to be a “perfect storm” for major billing and equipment issues. Essentially the myriad of problems associated with all the changes happening at PWSA were not properly thought through. An experienced water management company should have been familiar with the type of problems that could occur with meter reader changeover and think ahead to anticipate and correct any of these problems.

Pennsylvania American Water (PAW)

Most of the City’s southern neighborhoods use Pennsylvania American Water because PWSA lines were never installed in these areas. But PAW charges more for water than PWSA. When water was controlled by the City of Pittsburgh Water Department, it was decided that the City would subsidize this extra cost to southern residents. Consequently, the City pays PAW the difference between City and PAW rates.

This practice continues today with PWSA paying PAW about \$2,000,000 a year in water subsidy. Table 6 shows the total dollar amount paid over the last 4 years.

TABLE 6

CITY OF PITTSBURGH WATER SUBSIDY TO PENNSYLVANIA AMERICAN WATER FOR SOUTH END CUSTOMERS	
YEAR	TOTAL PAID TO PENNSYLVANIA AMERICAN WATER
2012	\$2.19 million
2013	\$2.04 million
2014	\$2.90 million
2015	\$1.80 million
4 year TOTAL	\$8.93 million

Source: PWSA

RECOMMENDATION NO. 10:

PWSA needs to explore the possibility of eliminating this subsidy without raising the rates of customers in Pittsburgh’s southern neighborhoods.

PAW Sewage Charges

PWSA collects ALCOSAN’s sewage treatment charges for PAW customers. However, PAW uses the software SAP for its billing system and data mapping between Cogsdale and PAW’s SAP system was not completed, resulting in data misalignments. Consequently, some customers have not received a sewage bill from PWSA since December 2014. This was resolved by the end of June 2016 and bills have been set up on payment plans.

In hopes to inform the PAW sewage only customers about the billing delay, PWSA sent each sewage-only customer a letter. This resulted in PWSA customer service being inundated with telephone calls.

Two of the auditors are PAW water customers and received their past due sewage bills the first week of August 2016. The bills include different payment plans depending on the amount due. For unbilled amounts between \$50 and \$200, sewage charges can be prorated over 3 months with 1/3rd added to the monthly bill. For unbilled amounts equal to or greater than \$200, the charges can be prorated over 6 months with 1/6th added to the monthly bill. This payment plan is automatically added onto the regular monthly bill for the customer.

PWSA also stopped all automated payments from these accounts. This was to ensure that the customer would have better control over their payments.

Finding: Most PAW customers, who are City residents, were not billed by PWSA for sewage charges from January 2016 until approximately August 2016 and longer in some cases. These

sewage bill customers have been offered different payment plans depending on the amount due.

RECOMMENDATION NO. 11:

Offering PAW customers a payment plan for their sewage bill is a good practice and should be continued. PWSA should make every effort to accommodate each customer's ability to pay. If this situation were to ever happen again, billing should not be skipped; rather an average estimated charge based on the last 4 actual sewage bills should be calculated and mailed to the resident. Then when actual charges are reported adjustments can be made.

PWSA Customer Service

Customer Service has a total of 40 employees; 38 full time and 2 part-time. It is managed by a senior manager who oversees 5 sub-divisions:

- 1) AMI (advanced metering infrastructure) Team: Ensures accuracy in meter reading devices (MXUs);
- 2) Billing: Ensures accurate and timely delivery of bills;
- 3) Customer Service Contact Center: Provides prompt and courteous service;
- 4) Collections: Provides timely and accurate correspondence;
- 5) Dispatch: Assists customer and internal staff with accurate information for repairs.

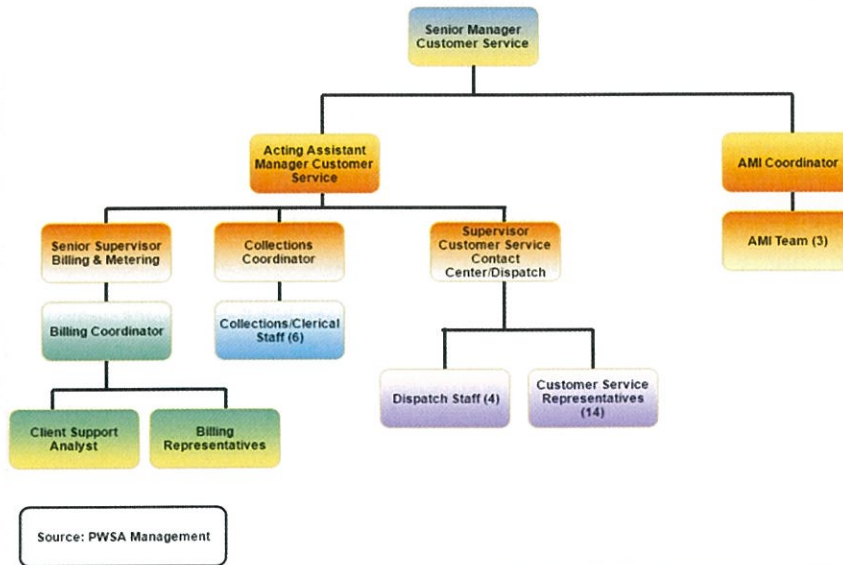
As the following flowchart shows, an assistant manager oversees 4 out of the 5 sub-divisions. The AMI coordinator and AMI team reports directly to the senior manager and a senior supervisor for billing and metering, billing coordinator, client support analyst, and billing representatives. A collections coordinator oversees the collections clerical staff members.

In Flowchart #2 below, the 5 subdivisions of customer service are not directly under the senior manager as the auditors were told. Further conversation yielded a revised organization chart that can be found under Flowchart #3. PWSA administration is revising the customer service organizational structure.

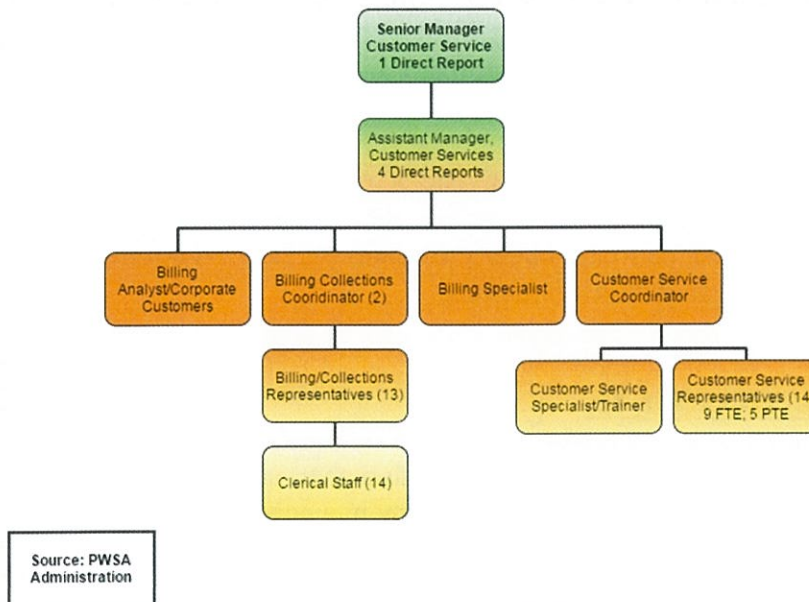
RECOMMENDATION NO. 12:

The proposed customer service organization chart should be immediately adopted. It explains management and employee responsibility in a concise way.

Flowchart #2 Customer Service Organizational Flowchart



Flowchart #3 PWSA Proposed Customer Service Organizational Flowchart



Customer Service Telephone and Computer Software

The customer service contact center is staffed by 12 employees. The current telephone system uses Toshiba telephone equipment with basic Taske software that utilizes auto-attendant call trees with no analytic or reporting software. Auto-attendant call trees can be described as a system that allows callers to automatically be transferred to different telephone lines/extensions, without the need of an operator or receptionist.

When a PWSA customer calls the customer service number there is 55 seconds of talk devoted to sewage-only customers, explaining recent billing issues and resolutions. Then the following options are given: Press 1 for outages/emergencies, 2 for payments, 3 dye testing/permits, 4 office address and location hours, 5 speak to a representative, 6 for an employee directory and 7 to repeat the menu. It takes the caller 1 minute 58 seconds to hear the number to press for customer service.

The calls are then directed into 5 main categories with a total of 68 lines. The 5 main categories are:

- 1) Automated Meter Interface (AMI)
- 2) Billing
- 3) General
- 4) Collection
- 5) Dispatch repair

PWSA's Taske telephone software tracks the number of calls coming in, the time it took to answer each call and the call abandonment rate (callers who hang-up).

Finding: This basic Taske telephone system has limited analytic reporting of the call. For example, no customer information, concern, property address or problem resolution is tracked. However, calls are written in the individual customer record.

RECOMMENDATION NO. 13:

PWSA should upgrade its telephone system to a system that can track customer information and the reasons for their call.

PWSA Telephone Answering System

Long waits to speak to representatives were compounded by a cumbersome automated telephone menu system. As previously reported, the automated system first provided a number to press in case of an emergency. Then a customer has to listen to 4 different options before option #5 is given to speak to a customer representative.

PWSA’s customer service performance goal in 2015 was to connect the customer to a general customer service representative in 5 minutes or less. In 2016 this goal was increased to 7 minutes.

Finding: PWSA automated customer service telephone system is not efficient.

Customer Service Survey

In 2015, there were substantial local news media reports of PWSA’s poor customer service and billing problems. Many customers received outrageous water bills. According to these reports, numerous customers experienced long waits and disconnections while attempting to get through to talk to a PWSA customer service representative over the telephone.

To evaluate the time it takes PWSA’s customer service to answer calls, the auditors conducted a telephone assessment during the period of March 7 through April 1, 2016. Auditors made daily random telephone calls between the customer service hours of operation, 8:00 am through 6:00 pm Monday through Friday. A total of 70 calls were made at different times during the day. The auditors recorded the following: date of call, day of week call was made, time of day, number of callers ahead, and how long it took operator to answer.

The telephone survey results reported the shortest call wait time before a PWSA representative answered was one minute and 58 seconds (1:58); two calls occurred within this time frame. The two longest call wait times experienced were one at eighteen minutes and two seconds (18:02) and the other call at seventeen minutes and seventeen seconds (17:17). Table 7 shows the results of the telephone survey.

TABLE 7

PWSA CUSTOMER SERVICE TELEPHONE SURVEY		
WAIT TIME FOR CS REP TO ANSWER CALL	OCCURRENCE	PERCENTAGES
0:00-2:00	3	4%
2:01-3:00	14	20%
3:01-4:00	4	5%
4:01-5:00	11	16%
5:01-6:00	5	7%
6:01-7:00	5	7%
7:01-8:00	10	14%
8:01-9:00	6	8%
9:01-10:00	0	0%
10:01-11:00	5	7%
11:01-12:00	0	0%
12:01-13:00	2	3%

TABLE 7 (continued)

PWSA CUSTOMER SERVICE TELEPHONE SURVEY		
WAIT TIME FOR CS REP TO ANSWER CALL	OCCURRENCE	PERCENTAGES
13:01-14:00	1	2%
14:01-15:00	0	0%
15:01-16:00	0	0%
16:01-17:00	0	0%
17:01-18:00	1	2%
18:01-19:00	1	2%
Disconnects	2	3%
TOTAL CALLS	70	100%

As Table 7 shows, 42 calls or 60% met PWSA’s goal of answering customer service calls within the 7 minute window. Twenty-six (26) calls or 37% of the calls in the survey took longer than 7 minutes to answer; 2 calls or 3% were disconnected. Ten (10) calls or 14% took 10 minutes or longer to answer.

Finding: Twenty six (26) or 37% of calls in the survey did not meet PWSA’s 7 minute or under goal.

Telephone Menu Changes

In July of 2016 the messages on the PWSA telephone line were changed. The first 40 seconds are devoted to a welcoming message and then to sewage-only customers, explaining that these customers should be receiving monthly bills with no penalty or interest charges. Then the following options are given: Press 1 for sewage only customers with delayed billing questions, 2 for outages/emergencies, 3 for payments, 4 lead testing, 5 office address and hours of operation, 6 speak to a customer service representative, 7 dye testing/permits, 8 for an employee directory and 9 to repeat the menu.

Finding: The new menu changes delay reporting emergencies and getting to customer service.

Emergency Calls

Water is the same as all the other utilities, essential to life and easily disrupted by nature or accidents. PWSA must have 24/7 telephone coverage in case of an emergency. Pipes can burst because of cold weather; or contractors can accidentally hit a water line while

digging. (This is not always the contractors fault. The auditors know of instances where marked water lines were not located correctly and were ruptured during digging.)

The auditors were informed that when Veolia was in charge of the Authority the 3rd shift emergency was eliminated in order to save money. Emergency calls were routed to the water treatment plant where 24 hour coverage is necessary. These employees would then notify the appropriate person if an emergency occurred and help was needed.

Currently to report an emergency the main PWSA telephone line is called and as the second option on the automated message, one is connected in 53 seconds. An emergency by its very nature means that time is critical. For example, if a contractor hits a water line and water is pouring out, PWSA must be called. A plumber reported that his calls to the current emergency line have been busy or he has been placed on hold or the telephone just keeps ringing and ringing.

RECOMMENDATION NO. 14:

When the PWSA telephone number is called there should only be 2 options; 1 for emergencies and/or outages and 2 for all other calls. This would allow emergencies to be identified first, and then under number 2 the other areas of interest could be listed.

RECOMMENDATION NO. 15:

Emergency calls should go directly to a live person (Dispatch) to answer and take care of the problem immediately. If only one person is working the emergency line then the system must connect to someone else who can address the problem.

New Telephone System Request for Proposal

The auditors were told by PWSA administration that they were aware of the need for a new telephone system. In February 2016, PWSA issued a new Request for Proposals (RFP) for a “Contact Center Software-as-a-Service Cloud Solution” that was due March 2, 2016. The RFP included several important capabilities PWSA wanted the new software to include. These functions consisted of:

1. Automated Call Distribution (ACD): multi-media requests; Skills-Based routing; multiple queues, intelligent priority handling, real-time and historical analysis and reporting; transferring calls outside of the ACD; tracking and measuring agent availability
2. Recording and Monitoring: supervisory monitoring of agent conversations; customer surveys; recording and storage of agent conversation; key performance indicators

3. Call back messaging: caller wait-time announcement; ability to leave message and remain in queue
4. Routing: skills-based and priority-based routing; dynamic changes; overflow
5. Remote (Teleworker) Agents: support remote agents
6. Automated Attendant: layers of depth to menu; automatic greeting changes; option of profession versus in-house recording of voice prompts; holding music and messaging
7. Soft telephone Capability: ability to transfer, conference, and speed dial without synchronization issues; ability to answer ACD and direct dial calls; multi-media displays viewable to agent
8. IVR: supports standard interfaces; can be administered remotely
9. Email: out-of-the-box functionality; auto-response functionality; real time re-routing
10. Web Chat: auto-response functionality; transfer options; transcripts; control of number of media assigned to an agent
11. Reporting: standard reports, ad-hoc, exportable
12. Workforce Optimization: forecasting to plan staffing levels; what-if analysis; agent skill-skills; agent scorecard.

According to a PWSA press release on September 21, 2016, PWSA upgraded its telephone wire routing switches on September 22, 2016. Customer service was closed from 2:30 PM until 6:00 PM. The e-mail correspondence was still available as well as making payments in person at the main office with checks or money orders. A new number to handle emergencies during this time period was included in the press release.

Customer Service Email Correspondences

PWSA allows customers to contact their customer service department by email with questions or concerns. This email service and data tracking began in June of 2015. The auditors requested a copy of the emails from June to December 2015. This data includes: the date, address, account number, name of customer, issue, solution, date of the issue/concern closed and follow-up information. Customer service's goal is to respond to customer's emails within 2 business days.

Finding: The customer service department acknowledges that they did not always meet the goal of responding to customer's emails within 2 business days, but continues to make improvements. (This information is documented in the excel database used to track email correspondences. The date the issue is opened is included as well as the date the issue was closed.)

Finding: The emails are not consistently labeled for categorization. For example, emails about missing bills have fallen into several categories and include: "billing delay", "billing issue", "bill not received", "bill status", etc.

RECOMMENDATION NO. 16:

Tracking emails (questions/concerns) is necessary for reporting and research. However, PWSA administration should make sure a category key is used during this tracking to ensure consistency and accurate reporting

Email Correspondence Analysis

With over 1,500 different categories for approximately 5,025 email entries from June 1, 2015-December 31, 2015, it was impossible for the auditors to sort all of the emails. Therefore, the auditors, to the best of their ability, selected a sample of like categories; this was 2,619 or 52% of the emails.

Auditors reviewed the data and combined the most common call types into 8 categories. The 8 categories were, Final Bills, Missing Bills, Service Related (Service Issues, Service Orders, New Services, etc.), Appeals, Owner/Tenant Information, Account Info (Change of Address, Name, etc.), Sewage Related Issue/Question, and Bills about High Consumption. Table 8 shows the most common categories for calls, the number of calls received and what percentage of calls that category represents.

TABLE 8

2015 SAMPLE OF PWSA E-MAIL CORRESPONDENCE		
MOST COMMON EMAIL QUESTION OR CONCERNS	NUMBER OF EMAILS*	% OF TOTAL EMAILS
Final Bill	666	13.25%
Missing Bills	489	9.73%
Service Related (Service Issues, Service Orders, New Services, etc.)	375	7.46%
Appeals	339	6.75%
Tenant/Owner Info	262	5.21%
Account Info (Change of Address, Name, etc.)	214	4.26%
Sewage Related Issue/Question	172	3.42%
High Consumption Bill	102	2.03%
TOTALS	2,619	52%
Other (Unable to sort-not in sample)	2,406	48%
TOTAL EMAILS	5,025	100%

*Numbers are approximate due to inconsistency in categorizing.

Source: PWSA Customer Service

The most frequently e-mailed question/concern in the sample time period (June 2015 through December 2015) was pertaining to “Final Bills” with approximately 666 emails or

13.25%. The second most frequently e-mailed question/concern was in regards to “Missing Bills” with approximately 489 emails or 9.73%.

Finding: About 48% percent of the emails had categories that were too vague or were unable to be sorted easily.

RECOMMENDATION NO. 17:

PWSA customer service needs to establish general categories for recording emails and train personnel in using these categories. This will allow consistency of reporting.

Current Personal Water Problems and Testimonials

A Homeowner’s Experience

While the audit was being conducted, a few personal incidents occurred that were reported to the auditors. One incident involved a City homeowner who noticed a sink hole in front of his house in the street. His Shadyside neighborhood street was milled and was getting ready to be newly paved. The City’s paving contractor contacted PWSA to report the sink hole. PWSA came to the homeowner’s property and performed a dye test and recorded a camera video inspection of the line. PWSA told the homeowner that he and his next door neighbor shared a sewer lateral. Both owners contacted plumbers for estimates of repairing the lateral sewer line. A number of requests were made to PWSA for a copy of the video taken. PWSA did not return numerous telephone calls. It took 3 weeks to get the video to the homeowner.

In the meantime, a plumber was hired to correct the problem. PWSA told the plumber that both homeowners would need a common lateral easement agreement to be added to each property title. An attorney was hired to prepare the easement agreement at a cost of \$600.

Upon inspection this plumber discovered that the two neighboring houses did NOT share a sewer lateral. PWSA was notified of their error and returned to the house to complete a 2nd dye test. During this 2nd dye test, PWSA confirmed that the two houses did NOT share a lateral and that the lateral needing repair was solely for the original homeowner. PWSA also performed their own video camera of the main sewer line and conducted 4 more dye tests to the properties in question. They confirmed NO common lateral existed between the two houses. As a result of PWSA’s error and lack of response, both homeowners wasted time and money.

When the auditors brought this to PWSA’s attention the administration’s response was that it PWSA should not have conducted a video inspection of the line. The administration stated that the video technician was only trying to do the homeowner a favor but it really wasn’t PWSA’s responsibility.

RECOMMENDATION NO. 18:

One of the cost saving initiatives by Veolia was for PWSA to own a video camera truck. This truck and the resulting video should be made available to residents with street sewer problems.

A Contractor's Experience

Also in April 2015, a plumbing contractor was hired to dig up a sewer line in the street. Proper procedure required contacting all utilities to mark the location of underground lines. PWSA marked a water line in the street at one specific location.

When the plumber was excavating the street to repair the sewer line, he hit a water line in the street that was not marked. Water was gushing out and he had to call PWSA to report the emergency so repairs could be made to the water line. He could not get through to talk to someone about the water line. He got the automated telephone system and was placed on hold for ten minutes. As recommended previously, emergency calls should be connected directly to a live person. Finally, he got connected and PWSA came out to fix the water line.

The contractor actually found a 3rd water line in that same street that was unmarked. PWSA did not know about the other 2 water lines in the street since neither line was on PWSA's records so they could be properly marked.

RECOMMENDATION NO. 19:

PWSA needs to document and map all water and sewer lines throughout the City. It needs to obtain a complete asset management software program to accurately track repairs and new installation of lines.

A Landlord's Experience

One of the auditors is a landlord and since 2010 this landlord strictly used the PWSA web page to receive and pay PWSA bills. One of the problems with the PWSA on line bill pay system is that payments are not immediately posted on line and monthly bills are often posted late. This makes the service always behind.

In July of 2016 one rental property stopped receiving water bills. The PWSA site was regularly checked and there were no bills, and the payments made, were not posted. This house was tenant occupied and the landlord had nothing to show the tenant for water reimbursement. The landlord contacted customer service about no bills on the internet; they said that the payments had posted and that the bills would be posted soon.

Another month went by with another call to customer service; again a promise of correction that did not happen. The tenants lease was up in October and the water bills for July, August and September were missing. Finally the landlord emailed PWSA and then followed up with a call. Four bills were received all dated the same October 10th date. All of the bills showed high consumption because there was a leak in the basement that the tenant and landlord were not aware of. The tenant was moving out and felt no responsibility to pay the bills.

The landlord wrote a letter to the exoneration board in November 2016 and explained the situation. She received a letter acknowledging receipt of the request and a hearing date would be scheduled. It has been 2.5 months and no hearing date has been set.

RECOMMENDATION NO. 20:

PWSA administration needs to investigate why monthly bills were not being posted online and why there was a delay in scheduling an exoneration hearing. Also the system needs to acknowledge online bill payments in a more timely fashion.

A Tenant Experience

The night of December 25, 2016 a water main break occurred in the neighborhood of Regent Square. **Water was not available to residents on multiple blocks for several days.** From Christmas Day to New Year's Day, water was turned off and on without warning, 24 hours of the day. The tenant never received notification of this service interruption from PWSA. A telephone call or any notification about the problem should have occurred.

In early January, PWSA realized that this was a huge inconvenience for residents and tried to limit the water unavailability by only turning off the water from 10 PM to early morning hours. When the water was on there were no restrictions in usage. Around January 15th the water was continually on.

Compounding this inconvenience was from the time this break occurred, the entire street was closed for access, preventing use of the street for driving and resident parking. There also was no notice that the street was closed for repairs. Residents had to park half a block away. On February 1st, the street was finally fully repaired and opened for public access. It took over a month for everything to be fixed.

Finding: In this instance PWSA did not communicate to all residents when the water was being disrupted.

RECOMMENDATION NO. 21:

PWSA needs to establish a protocol to notify all residents, including tenants, in the surrounding area of a water main break. The street should have been posted with signs

explaining the disruption of service and notice of when PWSA expected the problem to be fixed.

Types of Customer Payments

According to the PWSA webpage customers can pay their bills five (5) different ways: 1. Electronic Bill Payment and Presentment (EBPP), 2. One-Time Remote Bill Pay via Telephone or Online, 3. Cash Payment at Any 7-Eleven Location, 4. Zipcheck Payment or at the 5. PWSA Customer Service Center.

1. Electronic Bill Payment and Presentment (EBPP)

The EBPP is a free online bill paying service that allows customers to receive monthly emailed bills and make payments online. This service is environmentally friendly as it prevents wasted paper caused by bill printing and saves the cost of postage by sending/receiving payments. This option allows customers to also print and view invoices. The website promises that this process is quick and easy and can be done in as little as 3 steps. All a customer has to do is: have their account number and billing zip code, pick a user name and password and enter their email address. The online system also provides for the customer forgetting their username and/or password by prompting the individual to enter their email address and account number.

Customers can make a one-time payment or sign up for automatic bill pay. The automatic bill pay requires a valid credit card, checking or saving account be entered and kept online as part of their record. When bills are generated the money is automatically deducted from this pay source on the bills due date. Individuals sign up for this convenience so that the bill is paid in a timely manner and to remove the hassle of paying a monthly bill.

Customers receive an email that their PWSA bill is ready to be viewed online. The email includes the account number, billing date, payment due date, and amount due. The email does not include the property address for multiple property owners.

If there is a problem with a reading or if there is high consumption of water at the property, it is not noted on the email. PWSA, over the last 4 to 5 years has sent a "High Consumption Notice" in the mail to the homeowner or the property having the problem.

Conversations with PWSA staff have indicated that they are disappointed that more people do not use their online services.

Finding: The customer is not able to log onto the web site unless they have a pre-established email and their account number handy to use this service.

Finding: Customers that receive emailed bills do not receive any notification if their bills are unusually high.

RECOMMENDATION NO. 22:

Customers enrolled in this monthly automatic bill pay should receive an email before the money is removed stating when it will be deducted and how much. This will allow the customer to contact PWSA if there is an issue before the money is deducted. Auditors found in their research that other utility and bill-pay services do this already.

RECOMMENDATION NO. 23:

PWSA should study offering an incentive to their customers to promote going green. A joint promotion with a local bank or sporting goods store might be worthwhile or a discount could be offered to the online subscriber.

RECOMMENDATION NO. 24:

PWSA should allow an alternative identifier to create an account in lieu of the account number if a customer does not have it readily available. Other utilities and companies use other personal descriptors such as social security number, address, and zip code or answer a security question in order to access account information. Some companies offer more than one identifier to choose from.

2. One-Time Bill Payment via Telephone or Online

Residential and commercial customers can make a one-time bill payment online or by telephone. To make a one-time telephone payment, customers call 412-255-2423 and select menu option #3 and follow the directions. The PWSA website notes that, "a service fee will apply" but does not indicate a price. Auditors called to inquire about this fee but an account number was needed to advance to a live person.

To make a one-time online payment the customer must click on "One Time Payment", a red line appears at the top that states, "**Please note that Level One charges a service fee for paying bills using this service**". An account number and billing zip code must be entered. Additionally, an image verification called a CAPTCHA (completely automated public turing test) is required. (This is when you have to copy letters or numbers in a box.) This method of fraud protection is pretty standard with most online bill pay systems.

The next page asks if you would like to use a bank account or debit/credit card. Once you select one, the next page shows your account number and total at the top. You are asked basic information such as your email, address of the card, the credit card number and expiration date.

Finding: This option seems relatively easy but you are not told the amount of the fee for this service. As a test, auditors went through the first three steps and reached the page asking for the credit card number. **At no time was the fee listed.**

RECOMMENDATION NO. 25:

Customers should be told how much the fee is for the service prior to entering their personal information.

3. Cash Payment at local 7-Eleven or Family Dollar Stores

PWSA states that this method is quick and convenient and only requires that a customer bring their bill stubs to any 7-Eleven or Family Dollar location. The customer must have their bill because there is a pay code on the back that is entered when payment is made. This notifies PWSA that a payment was made on your account. The customer tells the cashier how much they wish to pay and a cash payment is accepted.

A \$1.49 processing fee is charged and a receipt is given to the customer as proof of payment. The auditors were told by PWSA management that 50% of the fee goes to the company that processes payments and 50% goes to 7-Eleven or Family Dollar.

4. PWSA Customer Service Center

Customers are able to go to PWSA's Customer Service Center at 1200 Penn Ave, Pittsburgh, PA 15222 to pay their bills. This building has other companies located in it. The PWSA office is open Monday through Friday from 8:00 AM to 6:00 PM. The office accepts money orders, cashier's checks, credit card and debit card. **They do not accept cash.** In the buildings foyer there is a receptionist and you are required to sign into the building marking the time of entry and where you are going. When you leave you are also required to sign out with the time.

The times the auditors visited the office the receptionist was welcoming and helpful. In the controller's last performance audit this was not true and a recommendation was made to improve the receptionist greetings. The controller's recommendation to have a more helpful and pleasant receptionists was followed.

The Customer Service Center is to the right of the reception desk. Three (3) windows enclosed in partial glass are on a counter. The times when the auditors visited the premises, there were 2 individuals working the counter. While it is helpful if the customer has a copy of their bill it is not necessary, a copy will be printed at the counter.

Additionally, the building's foyer has a locked deposit box for convenient bill drop off. This box is emptied daily and eliminates the need for the customer having to sign-in and go into the Customer Service Center.

RECOMMENDATION NO. 26:

PWSA should explain on their website and on customer's bills that payments can be dropped off in the lobby of the Penn Avenue offices.

5. Zipcheck

Zipcheck is an automated bill pay system that allows PWSA to automatically deduct your bill amount from a designated account every month when your bill is due. The customer's financial institution manages your payment and you will still receive a PWSA bill 20 days before the due date.

This is a free service provided by PWSA. To sign up a PDF file is available to download on the PWSA website. The form along with a voided check must be mailed to PWSA. Payment is directly deducted from your account on your bills monthly due date.

Finding: The website does not indicate how long it would take for this autopay process to be complete after you have sent the check and application.

Water Shut Off Process for Delinquent Accounts

If a company or individual doesn't pay their water bill, after a certain period of time PWSA will shut off their water. The auditors asked the senior customer service manager for an explanation of how PWSA Customer Service handles delinquent accounts leading to shutting off a customer's water.

A customer has 20 days to pay their bill. On the 21st day, your bill is considered late and after 37 days PWSA will make an automated collection call (robocall) asking for payment in full. In addition, a 37th day letter is sent with a delivery confirmation and customer's required signature. After 10 days or on the 47th day, a letter called the 10 day letter is sent.

If no payment is received, PWSA posts a notice on the property address warning that the water will be shut off if payment in full is not received. Within 24-48 hours of this posting, PWSA will call the customer again to inform them that a shut off of the water will occur. Payment in full is due within 24 hours. PWSA will shut off the water and assess a \$125 shut off fee to the customer's account. This covers the cost of the plumbing staff to turn off the water and turn it back on after payment is made.

PWSA does supply “Rules and Regulations of the Pittsburgh Water and Sewer Authority” on its webpage. Chapter 2 covers “Customer Rights And Obligations”. This chapter explains how residents, businesses and tenants can apply for water and how and why water can be terminated.

Finding: In PWSA’s section 209.0 Termination of service, “Customer Rights and Obligations” has contacting customers by telephone as a last effort not at the beginning of the process.

RECOMMENDATION NO. 27:

If contacting a delinquent customer initially by telephone is a new part of the termination of service collection process, then PWSA needs to update section 209.0 Termination of service, “Customer Rights and Obligations” on its webpage.

Shut Off Notices

Customer service gave the following information concerning the number of termination notices sent and shut offs in 2015. Accounts that are delinquent or not paid after 90 days are to go to Jordan Tax Services for collection which will be explained later in the audit.

Finding: In 2015, there were 630 shut offs and 11,756 postings to properties warning of possible shut offs if the bill was not paid in full. This represents 5% of posted properties that got their water shut off due to delinquency.

TABLE 9

2015 SUMMARY OF ACCOUNTS	
STATUS	NUMBER OF ACCOUNTS
Received 10 Day Letter	45,541
Received 37 Day Letter	4,971
Property Posted concerning Shut Off - 48 hour notice	11,756
Water Shut Off	630

Source: PWSA Bar Charts

The auditors were confused with these figures and reached out to PWSA for clarification. However, telephone calls and emails were not returned. Table 9 shows that less than 1% of the households that received the 37 day shut off letter actually had their water shut off. The threat of shutting off water is a very effective tool for getting people to pay their bill.

Once water service is terminated, all arrearages must be paid in full before water can be turned on. No payment plan will be accepted. This has remained unchanged since the Controller's last Performance Audit.

State Requirements for Utility Termination of Service

As an authority, PWSA does not have to follow State requirements for utility termination of service. However in comparison to the state, PWSA gives more time before termination of service.

The Pennsylvania State Legislature, in 2014, renewed the "Responsible Utility Customer Protection Act," Chapter 14 of the Public Utility Code for another 10 years. The new law revised some Chapter 14 provisions. The following are utility termination requirements for all PA residents for all utilities:

Your utility company can SHUT OFF your service if you FAIL to do the following:

- Pay your bill
- Follow through on payment arrangements
- Pay a deposit, if required
- Allow the company access to its equipment

Before your service is shut off, your utility company will take the following steps:

- Send you a 10-Day Notice. Once you get the notice, the utility company has up to 60 days to shut off your service.
- Attempt to contact you three days prior to your shut-off date.
- During winter months (December 1 through March 31), if the utility company cannot reach you at the time of termination, they will leave a 48-hour notice at your residence.

Finding: In section 209.0, Termination of service, "Customer Rights and Obligations" there is no minimum outstanding balance owed before PWSA shuts off the water. A customer can owe \$10 or \$300 and have their water shut off if no payment is made within 30 days. Neither is there a minimum dollar values for termination of service in the State requirements.

One state requirement that should be adopted by PWSA is the requirement that with a medical reason a utility cannot terminate the service. In section 209.0, Termination of service, "Customer Rights and Obligations" nothing is mentioned about stopping termination if a person has a medical condition that requires him or her to have the utility kept on. For example if a person is diabetic or has oxygen it would jeopardizes the individual to be without gas, electric or water.

RECOMMENDATION NO. 28:

PWSA board should establish protocol for a sick individual's water to not be turned off. The state regulations provide a 30 day leeway and the board can use that as a guideline and/or partial payment of the bill can also be required to keep the water on.

Delinquent Accounts

Media reports have claimed that PWSA has millions of dollars owed to them in delinquent accounts yet keep raising water rates. The auditors requested a copy of all the delinquent accounts for 2014 and 2015. The information received included two separate delinquency files for each year and a customer data base. These files were quite large and required careful evaluation by the auditors. The 2014 PWSA report had 190,713 accounts showing delinquencies totaling \$34,090,266.39. For 2015, the report had 198,080 accounts totaling \$40,934,552.18.

The 2014 and 2015 report listed a location ID, Customer ID, and the delinquent amounts by number of days overdue. For example, 0-30 days, 31-60 days, 61-90 days, 91-120 days, 121-180 days and over 181 days. These reports did not identify the property address or customer name.

The customer data base was a separate file and identified the property address or customer name. This file contained fields such as location ID, service address, customer name, customer ID, and billing address. The 2 files were merged with the yearly report to obtain delinquency status and to identify account owners. Because of the massive amount of data in both 2014 and 2015, the auditors, for this audit, focused only on the 2015 data of delinquent accounts.

The auditors discovered that some delinquent accounts include City-owned properties and also accounts that existed in the old PWSA software system that did not transfer properly into the new system. PWSA reported that these properties are designated as "orphan" accounts because they do not have good addresses, and most likely were demolished, vacated, changed ownership and were not removed from the system.

Finding: There were 14,156 orphan delinquent accounts totaling \$1,581,472.88 in 2015.

Finding: There were 595 City-owned accounts totaling \$2,146,752.12 in 2015.

RECOMMENDATION NO. 29:

PWSA needs to "clean up" the orphan accounts and verify that these properties can be removed, since bills cannot be mailed for the various reasons mentioned. Because of these accounts, PWSA outstanding bills data is skewed. If they are never going to be paid, they should be removed.

RECOMMENDATION NO. 30:

PWSA should work with neighborhoods and initiate a “neighborhood report line” that would allow neighbors to be watchdogs and report the abandonment of buildings in and around their neighborhoods.

Top 100 Delinquent Accounts in 2015

The auditors chose to concentrate on the top 100 delinquent accounts with the highest dollar amount owed for 2015. The auditors sorted the database by total amount owed in descending order to get a list of the top 100 delinquent accounts.

Each account was researched to verify the “type” of account it was. Using Allegheny County’s real estate website, each property address was entered and the information used to classify the property into 9 categories: residential, governmental, business, institutional, City of Pittsburgh, abandoned, utility companies, condominium, or unknown.

A property was considered abandoned if county or city taxes were unpaid for a number of years, and/or the building had already been razed. One property had a service address that did not correspond with any address in the real estate website. This property is shown in the table below separately as an unknown.

This top 100 list excludes the orphan accounts and abandoned/vacant properties already identified in PWSA’s data base. City-owned properties are included in this list. These 9 categories are summarized in Table 10 below:

**TABLE 10
BREAKDOWN OF THE
TOP 100 DELINQUENT ACCOUNTS IN 2015**

Category	# of Accounts	Amount Due 0-30 Days	Amount Due 31-60 Days	Amount Due 61-90 Days	Amount Due 91-120 Days	Amount Due 121-180 Days	Amount Due Over 181 Days	TOTAL
Business	29	\$1,732,516.17	\$157,301.71	\$162,230.65	\$289,850.88	\$123,293.60	\$349,411.01	\$2,814,604.02
Governmental	12	\$480,614.65	\$554,104.26	\$664,995.94	\$49,352.07	\$77,980.55	\$659,526.77	\$2,466,574.24
Institutions	30	\$1,150,135.70	\$124,479.62	\$243,693.91	\$51,215.70	\$16,185.39	\$50,923.76	\$1,636,634.08
City of Pgh	8	\$3,613.46	\$5,350.12	\$385,514.34	\$11,588.12	\$58,165.54	\$564,692.08	\$1,028,923.66
Utilities	3	\$40,288.51	\$48,673.88	\$41,691.40	\$39,848.15	\$83,449.21	\$343,892.53	\$597,843.68
Residential	5	\$356,504.37	\$17.06	\$23.43	\$36.18	\$55.87	\$130,416.30	\$487,053.21
Abandoned	11	\$136.05	\$36.66	\$36.39	\$145.17	\$15.70	\$366,572.44	\$366,942.41
Unknown	1	\$17.22	0	0	0	0	\$31,993.56	\$32,010.78
Condo	1	\$26,993.90	\$163.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27,156.90
TOTAL	100	\$3,790,820.03	\$890,126.31	\$1,478,186.06	\$442,036.27	\$359,145.86	\$2,497,428.45	\$9,457,696.26

Source: Allegheny County Real Estate website and PWSA

Finding: The majority of the top 100 delinquent accounts (95%) were nonresidential.

Finding: The top 100 delinquent accounts with the highest dollar amount owed totaled \$9,457,696.26 for 2015. This is 23% of all the money owed to PWSA in 2015.

Abandoned/Vacant Properties

According to a February 9, 2016 *Tribune Review* article, \$6.3 million was owed to PWSA on 3,500 vacant lots. According to PWSA, these properties were billed continuously because they were not informed that the properties were empty. It is not uncommon for people to leave a property and not contact PWSA to shut off the water and/or report the move.

Finding: This delay in the water being turned off at these properties potentially wastes water, and wastes paper generating bills. It also increases the number of unpaid accounts on record.

City-owned Properties Water Usage

In accordance with a 1995 agreement with PWSA, the City of Pittsburgh is allocated 600 million gallons of water per year at no charge. Conversations with PWSA administration revealed that no one keeps track of the water used by the City and, in fact, many government buildings are not metered so it is unknown how much water is actually being used.

Finding: Not all City property is metered making it impossible to know how much water is being used by the City.

The auditors discovered that the City properties in the top 100 delinquent accounts included City parks, swimming pools and senior centers. There were 8 City-owned properties in our top 100 delinquent properties that totaled \$1,028,823.66.

State owned Point State Park has the largest delinquency amount owed with \$831,462.63. It is listed under the government category in Table 10. This is due to the 200 ft. wide fountain that runs from April through the fall attracting many tourists to the region.

A *Tribune Review* article dated February 23, 2016 reported that the state is unwilling to pay the bill because of disputed meter readings. The article did not specifically state what is wrong with the meter readings.

Finding: The City's unpaid accounts inflate the amount of delinquent water bills on PWSA's books.

RECOMMENDATION NO. 31:

The City-owned delinquent accounts should **not** be included in PWSAs outstanding delinquent balance totals.

RECOMMENDATION NO. 32:

PWSA needs to make a decision on how to handle property owned by the City and its water usage. The 1995 agreement between the City of Pittsburgh and PWSA gives the City 600 million gallons of water a year at no charge. Currently, there is no means to calculate City water usage because not all buildings are metered. The authority needs to explore the costs of metering every City-owned building.

City Payments to PWSA

The auditors discovered that the City’s Controller’s office pays some of the PWSA City water bills that are for City-owned properties. PWSA will mail these water bills to the Department of Innovation & Performance (I&P) for review. Then I&P will send the bills to the City Controller’s office for payment. The City Controller’s office will remit payment for the current amount due on these bills. Any past due amounts shown on the current bills are never paid unless documentation is provided from the monthly bills that accrued these charges. City Controller employees told the auditors that documentation for past due amounts are usually never provided and paid.

The auditors used the City’s OnBase system to see what type of PWSA accounts the City Controller’s office was paying for and how much money was paid on each property. The checks dated from 1/1/2015-12/31/2015 were researched. The type of property for each account was verified by visiting each address listed on the bill or typing in the address on the internet and viewing them on Google’s street view option via satellite.

Table 11 shows the addresses of each account, what type of property the account was for, number of payments made, amount paid in 2015, if the bill was an estimate or an actual reading, and the outstanding balance still on the account according to last bill posted in 2015.

TABLE 11

2015 CITY CONTROLLER’S OFFICE PAYMENTS FOR CITY PROPERTY BILLED BY PWSA					
ADDRESS	PROPERTY TYPE	# OF PAYMENTS PAID	AMOUNT PAID	LAST BILL READING	OUTSTANDING BALANCE ON LAST BILL
0-54th @ Duncan 15201	Duncan Park Lawrenceville	12	\$46.55	Estimate	\$12.65
0 Liberty Ave/Gateway Station 15222	Downtown Subway Station Stop	9	\$2,518.93	Estimate	\$16.90
930 Saw Mill Run Blvd. 15220	Vacant DPW Building	13	\$6,503.97	Estimate	\$4,070.67
1133/1203 Western Ave 15223	Police Headquarters	9	\$1,602.35	Actual	\$2,029.30

TABLE 11 (continued)

2015 CITY CONTROLLER'S OFFICE PAYMENTS FOR CITY PROPERTY BILLED BY PWSA					
ADDRESS	PROPERTY TYPE	# OF PAYMENTS PAID	AMOUNT PAID	LAST BILL READING	OUTSTANDING BALANCE ON LAST BILL
5 Allegheny Square 15212	Senior Center and Hazlett Theatre	13	\$3,064.43	Actual	\$748.70
830 E Warrington Ave 15210	Police Department Zone 3	10	\$1,144.76	Actual	\$1,857.02
4748 Monongahela St. 15207	Closed Hazelwood Library	6	\$22.70	Estimate	\$102.63
3284 Central Ave 15212	Bureau of Fire station 34	4	\$261.45	Actual	\$309.64
0 Schenley Plaza 15213	Park in Oakland	8	\$9,645.85	Actual	\$6,531.40
7513 Tioga St. 15208	Vacant private house	1	\$3.93	Estimate	\$506.48
7106 Race St. 15208	Vacant private house	1	\$3.93	Estimate	\$1,526.92
7326 Susquehanna St. 15208	Vacant lot	1	\$3.93	Estimate	\$571.69
5520 2nd Ave 15207	Vacant private house	1	\$15.15	Actual	\$4,273.10
TOTALS		88	\$24,837.93		\$22,557.10

Source: PWSA Bills and OnBase Research

After searching OnBase, the auditors found that in 2015 the City Controller's office made 88 payments for 13 different water and sewage accounts, totaling \$24,837.93. During the entire year, 7 of these accounts had estimated meter readings and 6 had actual readings. Eleven (11) of the accounts had "sewage only" charges except the Senior Center and Hazlett Theatre in the Northside and the Gateway Subway Station account located downtown. The Gateway Subway Station had "water consumption charges" and the Senior Center and Hazlett Theatre had "water and sewage charges."

The 7 estimated accounts were visited or researched online to verify if these properties could have any type of water or sewage consumption. Online research revealed the Tioga Street and Race Street addresses were vacant private homes and the Susquehanna Street was a vacant lot.

The auditors visited the last 4 estimated account addresses. The Saw Mill Run Road account is a vacant Department of Public Works building that was used by the Redd Up

division until 2014. The estimated readings on this account were extremely high for a property that has been vacant for over two years. The City never questioned the estimated readings and paid \$6,503.97 on the Saw Mill Run Road account in 2015.

The Hazelwood Carnegie Library on Monongahela Street is a vacant building that has been closed since 2004. The last two estimated accounts that were visited were Duncan Park in Lawrenceville and the Gateway Subway Station stop located downtown. **The auditors found that these two locations had no evidence of possible water usage: no bathrooms, water fountains, sinks, spray parks etc.** The City never questioned the estimated readings and paid \$46.55 and \$2,518.93 respectively in 2015.

Finding: The City I&P Department authorized the City Controller's office to make payments on the estimated bills for 7 City-owned accounts for the entire year of 2015 without question. All of these properties are vacant.

Conversations with employees in the City real estate department said that there is no formal policy for communicating to PWSA to shut off the water when a property is acquired by the City.

RECOMMENDATION NO. 33:

PWSA in conjunction with the City's real estate department and/or the I&P Department should go out and investigate these properties and get an actual meter reading. There is a possibility that there has been no water usage at these properties for months or years. If there is no reading the accounts should be deleted out of PWSA's system.

RECOMMENDATION NO. 34:

The City Controller's office should stop making water and sewage payments on any estimated bill they receive from PWSA and I&P until an actual meter reading is provided. This should happen even if the Department of I&P approves the bills for payment.

Jordan Tax Service (JTS)

According to the Jordan Tax Services website, JTS was founded in 1932 by J. William Jordan. It offers comprehensive revenue collection services to entities throughout Pennsylvania which include: school districts, municipalities, counties and authorities (including tax and utility fee collection); delinquent tax and municipal claim collection; courthouse record keeping; bankruptcy claim management; tax and utility bill printing; and comprehensive data (which includes accounting, banking and reporting services). Jordan Tax Services has customers in more than 85 boroughs, townships and authorities; 30 school districts as well as Allegheny County, the City of Pittsburgh and the Pittsburgh Water and Sewer Authority.

The Pittsburgh Water and Sewer Authority contracted with JTS to collect payment on delinquent water and sewer services on September 12, 2008. All accounts more than 90 days delinquent are to be turned over to Jordan Tax Service. The initial term of the contract was from October 1, 2008 to September 30, 2010. Sometime in 2010 there was an “Addendum to Agreement” dated September 12, 2008. This addendum states:

- The term of this agreement shall commence as of October 1, 2008 and unless sooner terminated pursuant to Article VIII, Part C hereof, shall expire on December 31, 2011. If not terminated and absent the Parties' agreement to one or more additional longer terms, this agreement shall automatically renew for an additional term or terms of one hundred eighty (180) days subject to the right to terminate as provided below.
- Except as specifically modified hereby, the parties do hereby ratify the agreement September 12, 2008 and confirm that all other terms and conditions remain unchanged and the agreement remains in full force and effect.

The JTS contract is still in force having been renewed several times. To view the whole JTS contract and the Addendum, can be found in the Appendix.

Under the “Miscellaneous Provisions” of the contract with Jordan Tax Services, it says: “Jordan shall be the exclusive Collector and SLC shall be the exclusive SLC of Delinquent Claims during the term of this Agreement. The municipality shall not accept any payment of any Delinquent Claims or enter into an installment payment agreement with any Delinquent Payer or any Delinquent Claim.”

Finding: Auditors were told by PWSA staff that they still collect payments from accounts over 90 days delinquent.

RECOMMENDATION NO. 35:

PWSA customer service should stop collecting payments from delinquent payers over 90 days old.

Jordan Tax Services Fees

The Jordan Tax Service contract states that servicing expenses and attorney fees shall be added to the delinquent claims and shall be recovered directly from the delinquent payer. All expenses and fees are contingent upon collection from delinquent payer by Jordan Tax Services. If Jordan Tax Services efforts do not result in payment, the municipality shall not be obligated to pay for any expenses or attorney fees.

The JTS contract also states that any compensation charges shall not exceed the amount set forth in the ordinance or resolution.

Finding: The auditors found Resolution No. 103 of 2008 which listed the not to be exceeded amounts for collections and services of municipal claims and municipal liens.

Specifically title searches cannot exceed \$250.00 with title updates not to exceed \$50 per occurrence. Reasonable attorney fees are for senior attorneys at \$185.00 per hour, junior attorneys at \$160.00 per hour, paralegals at \$100.00 per hour and law clerks at \$65.00 per hour. Other specific charges are listed in the resolution, a copy of which can be found in the appendix.

Jordan Tax Services Distribution of Payments

When payments are received in full, everyone gets paid for what is due. When delinquent claims are less than full payments or installments, Jordan distributes the payments in order of priority to:

1. **Special Legal Counsel (SLC)** for all attorney fees and third party expenses, which is rare and not the norm.
2. **Jordan Tax Services** for servicing expenses, postage expenses and out-of-pocket expenses.
3. **Courthouse** for record costs, lien costs and expenses, which is rare and not the norm.
4. **PWSA** for face, and interest of the delinquent claim (“The earliest in lien having priority until the delinquent claim is paid in full”).

Source: Jordan Tax Contract 2008

When Jordan Tax Services collects partial or installment payments, PWSA gets paid last. On average PWSA receives approximately 85% of installment payments, while 15% is distributed to Jordan Tax and legal fees. This has not changed since the controller’s 2010 PWSA audit despite there being a recommendation to renegotiate the payment terms when a partial payment was made.

The 2010 recommendation stated:

The PWSA should study the cost effectiveness of its contract with Jordan Tax Service regarding partial payments on delinquent accounts. The PWSA should determine if the legal fees and servicing expenses are excessive relative to the amount of the delinquent claim and to the amount paid to PWSA.

Finding: PWSA did not follow a past recommendation of the City controller’s 2010 audit regarding the Jordan Tax Service Contract. This is despite agreeing to the recommendation.

RECOMMENDATION NO. 36:

PWSA needs to review the process around receiving money for partial payments.

Jordan Tax Services Delinquent Accounts

Tables 12 and 13 shows the monthly delinquent accounts turned over to Jordan Tax Service from June 2014 to December 2015. (PWSA was not tracking this information before June 2014.) This information was provided to auditors by PWSA staff. In 2014, there were 26,676 delinquent accounts totaling \$3,238,895.40. In 2015, there were 26,944 delinquent accounts totaling \$2,623,217.43.

Finding: There was an increase of 268 delinquent accounts in 2015 from 2014, however, the total amount due decreased by \$615,667.97 or 19%.

The amount of money sent to collection with Jordan Tax Service seems very high; \$3,238,895.40 in 2014. However, when averaging that total by the number of accounts (26,767), the average delinquent account only totaled approximately \$121.41 in 2014. In 2015, the average delinquent account dropped to \$97.35.

Conversations with PWSA staff indicated that most of the accounts given to Jordan are commercial accounts. The staff member stated that accounts either had a payment agreement that wasn't paid, had the water shut off or went bankrupt; usually these accounts are settled for a lesser amount by PWSA.

RECOMMENDATION NO. 37:

PWSA needs to treat all past due accounts the same whether residential or commercial. Broken payment agreements or non-payment of bills should have their water shut off.

TABLE 12

2014 JORDAN TAX SERVICE DELINQUENT ACCOUNTS		
MONTH	# OF ACCOUNTS	PLACED AMOUNT
June	7,038	\$1,609,812.73
July	3,486	\$437,162.05
August	1,228	\$147,166.37
September	5,953	\$408,346.35
October	3,236	\$272,159.62
November	1,739	\$168,903.24
December	3,996	\$195,345.04
TOTALS	26,676	\$3,238,895.40

Source: PWSA

TABLE 13

2015 JORDAN TAX SERVICE DELINQUENT ACCOUNTS		
MONTH	# OF ACCOUNTS	PLACED AMOUNT
January	3,155	\$170,371.53
February	2,405	\$138,558.81
March	3,319	\$98,445.84
April	2,141	\$62,255.56
May	1,202	\$93,443.11
June	3,030	\$878,143.17
July	2,557	\$363,083.46
August	1,510	\$270,201.21
September	2,457	\$165,834.87
October	2,535	\$122,855.04
November	1,301	\$174,087.59
December	1,332	\$85,937.24
TOTALS	26,944	\$2,623,217.43

Source: PWSA

Jordan Tax Services Actual Collections

According to documentation provided to us by PWSA from Jordan Tax Services, JTS collected \$1,778,059.23 from clients January 1, 2015-December 1, 2015. PWSA collections totaled \$1,556,100.50 and JTS services and fees totaled \$221,958.73. This shows that approximately 14% of the money collected by JTS went to JTS and was paid by delinquent customers. While this shows that JTS is effective in the collection of delinquent payments, auditors recognized the hardship that their collection process can place on PWSA customers. JTS has established hardship payment plans but PWSA needs to do more.

At the point when the account is turned over to Jordan their water should already be shut off incurring a turn-on fee of \$125.00. Then once turned over to Jordan all collection costs are the responsibility of the delinquent party.

RECOMMENDATION NO. 38:

As recommend in the previous audit, PWSA should frequently reevaluate their contract with Jordan Tax Services to address the fee structure.

ALCOSAN's board of directors in October 2016 approved the Clean Water Assistance Fund to help eligible residential customers pay their sewage bill. Dozens of social service

agencies that work with Dollar Energy throughout the region are now accepting applications. The Clean Water Assistance fund will support eligible PWSA customers.

RECOMMENDATION NO. 39:

PWSA administration should offer other alternatives for delinquent collections that are more customer friendly and helpful. PWSA administration should work to be included with ALCOSAN's Clean Water Assistance Fund, which is only available for sewer customers and consider a similar fund for PWSA water customers.

90 Day Delinquent Accounts Test

Of the over 110,000 active accounts in the 2015 PWSA billing system, there were 20,329 showing a past due amount that was greater than 90 days overdue, totaling \$16.4 million dollars. It should be recognized while this represents a large number of accounts greatly overdue; this is also reflective of the substantial billing delays of recent times. These accounts are also not just City of Pittsburgh residents' water and sewage charges, but Pennsylvania American Water sewer customers, the Borough of Wilkinsburg, Millvale and West View and flat rate and transitional customers.

The auditors wanted to verify the status of these accounts with Jordan Tax Service because according to the JTS contract all these accounts should have been turned over to Jordan.

A random sample of 200 active accounts was drawn from this data to represent nearly 1% of the over 90 day accounts.

This sample of 200 totaled \$176,590, with a mean of \$882 and a median of \$91. In an effort to identify these properties, parcel numbers were gathered from the Allegheny County Real Estate website and were then looked up in the Allegheny County Department of Court Records to ascertain if liens had been filed against the property owner. Parcel numbers were not found for 13 of the properties of this sample. This may be due to the property being razed years ago and the street number no longer existing, a data entry error in the service address in PWSA's database, or possibly an error in the real estate website.

The remaining 187 properties were sorted into seven categories. Owner-occupied residential properties had both the service address and the billing address the same. Business accounts maintained the same billing and service account in the business name. Abandoned properties were properties which had been razed, or had unpaid tax liens for many years. Residential and commercial rental properties have the PWSA bills in the name of a rental company, or appear to house more than one residential unit when viewed in the real estate website. A property was categorized as non-owner occupied residential when the billing and services addresses were different but it could not be established if the property was abandoned or being rented. The institutional property is a private school and a church.

TABLE 14

SAMPLE OF 200 ACCOUNTS OVER 90 DAYS OVERDUE		
TYPE OF PROPERTY	# IN SAMPLE	DOLLAR AMOUNT OWED
Residential owner-occupied	77	\$19,930.81
Abandoned	31	89,402.42
Residential non-owner occupied	45	\$35,276.79
Business	5	\$305.40
Landlord/Leasing company	29	11,298.33
Institution	2	\$1,105.65
Unknown	13	\$21,040.78
TOTALS	200	\$176,590.39

Source: PWSA

The sample of 200 was sent to Jordan Tax Service with a request as to what was the status of each account. In other words, the auditors wanted to find out if the customer was on a payment plan, if the account was paid in full, or if the property had been liened and/or up for sheriff's sale.

Jordon Tax Service would not divulge any information about these accounts. They stated that this was because of an ongoing lawsuit filed by customers in 2016. The lawsuit is a class action suit filed for billing issues.

Finding: Jordan Tax Service would not provide any information about the status of delinquent accounts to the auditors because of an ongoing lawsuit filed by customers in 2016.

Test Alternative

Because Jordan Tax Service would not provide delinquent account information, the auditors had to find another way to analyze the status of these past due accounts.

A sample of 40 of these properties was chosen randomly to have their September through December 2015 billing statements printed from PWSA for review. The auditors found 1 property was abandoned and had reverted to the City of Pittsburgh. This account was dropped from the sample.

The auditors found that 28 of the 39 accounts in this sample had actual readings leaving 11 with estimated readings. Of the 28 accounts with actual readings, 7 had water service terminated as well as all the 11 estimated accounts. This totals 18 of the 39 in the sample (46%) with water shut off. When water service is terminated, sewage charges continue to accrue.

Of the 18 shut offs only 1 account had water service reinstated during this time. The remaining 21 were on a payment plan with PWSA. When a customer is on a payment plan the water remains on.

Finding: Almost half of the accounts in the sample did not enter into a payment plan and had their water remain off.

Finding: Bills continue to be issued to terminated accounts for ALCOSAN sewage treatment costs.

RECOMMENDATION NO. 40:

PWSA should not bill for sewage usage if the water is shut off; if water is not being used then sewage is not being used.

According to the senior customer service manager, once PWSA turns an account over to Jordan Tax Services, PWSA no longer follows the status of the past due account. Jordan Tax submits the percentage of collections received to PWSA every 2 weeks.

RECOMMENDATION NO. 41:

PWSA should track the status of past due accounts with Jordan Tax Services.

Water Exoneration Board

Pittsburgh City Code Chapter 330 outlines the responsibilities of the Water Exoneration Hearing Board. It was enacted in 1991 to "...hear consumer complaints concerning water billing procedures. The board is authorized to make adjustments in bills or offer exoneration should its findings indicate the propriety of action." It was originally comprised of "five (5) qualified residents of the city: the director of the Department of Water or their departmental designee; the City solicitor or their departmental designee; the director of the Pittsburgh Water and Sewer Authority or their authority designee; one (1) citizen appointed by the mayor; one (1) citizen appointed by the mayor from a list of not less than three (3) or more than nine candidates submitted by council, neither of whom can be a City government employee. Both candidates shall be confirmed by council."

However, in December of 2015 it was amended to read: "The Water Exoneration Hearing Board shall consist of five (5) qualified residents of the City: The Pittsburgh Water and Sewer Authority director of field services, the Pittsburgh Water and Sewer Authority senior customer service manager, and three (3) community representatives chosen by the mayor, one (1) who is an engineer, one (1) who is a lawyer, and one (1) with mediation experience. The community members shall be confirmed by council." The amendment was

enacted because of the Water Exoneration Board perceived as being solely run as an offshoot of PWSA.

According to the City of Pittsburgh's website, the three community representative positions have yet to be filled. A councilperson is quoted as saying he does not recall a full board being seated during his 12 years at city hall.

Finding: Despite being revamped in December, as of August the Water Exoneration Hearing Board does not have a full complement of members.

According to Chapter 3 of the Rules and Regulations of the Pittsburgh Water and Sewer Authority, when a property has been acquired "by the Commonwealth of Pennsylvania, the City of Pittsburgh, the Urban Redevelopment Authority, the School District of the City of Pittsburgh, or other government agency for street, school or other development purposes, the Water Exoneration Hearing Board will recommend exoneration of 100 percent of the water consumption, sewer system maintenance, and distribution infrastructure system charges for such property under the following circumstances: The property is vacant, and the government agency has certified to the authority, in writing, that the property is vacant and scheduled for demolition." It is further noted that no exoneration will be made in the absence of the notice and certification to the authority.

Finding: Property acquired by governmental agencies for the purposes of development may have their charges exonerated.

RECOMMENDATION NO. 42:

PWSA should work more closely with City officials to develop a similar system to deal with condemned properties. When a property is condemned and a contract offered to have it razed, past due records at PWSA should be exonerated as well. This will enable billing system records to more accurately reflect past due accounts versus having accounts on the books for properties that have not been in existence for many years.

Lead and Copper in Drinking Water

Exposure to lead and copper in drinking water can cause serious health problems. In adults, exposure to lead can cause damage to the cardiovascular system, increased blood pressure, hypertension, and decreased kidney function. Young children exposed to lead are more at risk than adults. In children, even low levels of lead can cause damage to the central and peripheral nervous system, behavioral and learning problems, slowed growth, and impair hearing.

Causes of Lead in Water

PWSA water is lead-free when it leaves the treatment plant and travels through the main lines under the streets. The main problem with lead infiltration occurs when water travels through lead service lines that branch off from the main line to the house. Other systems that can contain lead are home plumbing systems, and fixtures in the house that contain lead or lead solder. Lead and lead solder can leach from old corroded lines and fixtures thus contaminating the water supply especially when the water has high acidity.

The best way to prevent lead from leaching from water lines and home plumbing systems is to remove lead lines completely and replace them with copper or plastic/PVC lines. In Pittsburgh, the service line to the homeowner's curb stop box is owned by PWSA. The service line from the curb stop box to the house is owned by the homeowner. It is the responsibility of each party to inspect and replace their plumbing in the pipe distribution system.

PWSA does not know how many service lines in the distribution system are still lead. PWSA informed the auditors that they have no systematic listing or map of where lead lines exist in the city. PWSA said they did inherit some old paper work records from the City but after they examined them there were a number of issues with clarity and accuracy.

Finding: PWSA does not have a complete record of all service lines that contain lead.

A website called Keystone Crossroads posted an article from March 2016 titled "Utilities don't know where lead pipes are, and water testing offers limited safety assurances." The article mentioned that PWSA does not survey the materials in their distribution systems and quoted the old executive director who said "We don't have the exact number and location of lead lines. We've never actually surveyed that".

RECOMMENDATION NO. 43:

Eliminating lead in PWSA lines should be a top priority of PWSA's administration and board of directors. PWSA should devise a plan to inspect all lines they own to see which ones are still containing lead. If lead lines are detected in the distribution system, PWSA should plan to replace them as soon as possible.

RECOMMENDATION NO. 44:

Households concerned about their water lead level should have their water tested for lead and have their houses and outside service line running from the house to the curb stop box inspected by a plumber for lead piping and replaced.

A less expensive alternative to having lead lines replaced is to have a water filter attached to your main water drinking and cooking faucet. Another alternative is having a whole house filter. Either alternative can be expensive.

RECOMMENDATION NO. 45:

PWSA should work with a filtration company to offer discounted filters and filtration systems to its customers. An RFP could be awarded guaranteeing a certain amount of purchases. Also, an RFP could be awarded to plumbing companies that are willing to offer City water customers a discount in replacing a home service line. This way price guarantees could be given to customers willing to spend money on removing lead from their lines.

Lead Regulations

In 1991, the Environmental Protection Agency established a corrosion control treatment regulation called the Lead and Copper Rule to deal with these health safety issues. This regulation requires water systems to control their water's corrosive level, to collect tap samples from homes that might contain lead and establish a maximum safe level of permissible lead. All plans for control corrosion must be approved by the Pennsylvania Department of Environmental Protection (PA DEP) so a permit can be issued.

The lead rule in Pittsburgh is enforced by the Allegheny County Health Department (ACHD) who then reports all findings to PA DEP. In the past the ACHD and PA DEP required PWSA to test a sample of 50 homes for lead every three years.

According to EPA regulations if lead levels in the sample collected exceeds 15 parts per billion it is considered dangerous and corrective action must be taken. An action level exceedance is not a violation but requires PWSA to make additional steps including:

- Using additional corrosion control;
- Educating consumers about reducing exposure to lead;
- Replace lead service lines which are owned by the PWSA;
- Additional distribution system source water quality monitoring; and
- Source water monitoring/treatment.

The 50 homes PWSA selects for the lead sample have to meet certain criteria required by the PA DEP. PWSA has to select the sample of homes by different tiers. Tier 1 homes are selected first; they are single family structures that contain lead pipes, copper pipes with lead solder installed after 1982 or pipes served by lead service lines. If PWSA cannot find 50 homes to meet these requirements then Tier 2 sites are selected. Tier 2 sites are buildings or multifamily residences with the same pipe requirements as Tier 1 sites. Tier 3 sites are selected last if the first two tiers cannot complete the sample. Tier 3 sites are single family structures that contain copper pipes with lead solder installed before 1983.

Corrosion Control Compliance Issues

In July 1995, the PA DEP approved a treatment plant corrosion control plan made by PWSA and issued them a permit requiring the use of soda ash for corrosion control.

In April 2014, PWSA decided to switch from soda ash to caustic soda in the water treatment process because of the higher cost of soda ash and an obsolete soda ash feeder. PWSA never notified the PA DEP of the change.

According to the Safe Drinking Water Act, it is “unlawful for any person to construct, operate, and substantially modify a community water system without first receiving a permit from the department”. On February 18, 2016, PWSA received a violation notice from the PA DEP for not notifying them of this change.

The change from soda ash to caustic soda was unnecessary. According to the PA DEP, soda ash contains carbonate that coats water lines making it more effective at preventing lead and copper from leaching into the water. Both chemicals increase the alkalinity of the water but caustic soda does not contain carbonate to coat water lines and relies on the natural carbonates in the Allegheny River.

In January 2016 PWSA switched back to sodium carbonate (soda ash) from sodium hydroxide (caustic soda) to increase the alkalinity of the water. This was what the original PA DEP permit permitted.

Finding: PWSA violated the Safe Drinking Water Act by changing the type of corrosion chemical used without notifying and obtaining a permit from the PA DEP.

Finding: The PA DEP investigation is still in the preliminary stages and no fine has been issued at this time.

However, the violation requires PWSA to take additional steps regarding lead issues. According to the PA DEP administrative order, the following requirements are listed:

- PWSA will be required to complete two rounds of 100 lead and copper tests samples instead of 50 samples every 3 years from 100 Tier 1 sites throughout the authority’s distribution area; with the first set of tests to be completed by June 30, with results to PA DEP by July 10; and the second set by December 31, with results to PA DEP by January 10, 2017.
- Provide any sampling data PWSA collected since June 1, 2013 which covers the time when the change to caustic soda was implemented.
- Develop a plan to investigate lead levels within its system, the effect of changes to treatment methods for corrosion control, and recommendations for appropriate changes to assure the best possible corrosion control measures for the system.
- Outline in subsequent customer notices details of water sampling and analysis, and updates on investigation of treatment change impacts.

- Provide initial notice to all 300,000 customers about its prior change in corrosion control chemicals and the measures it is undertaking to evaluate impacts.

Management Responsibility

PWSA was under contract with Veolia for management services during the time the switch was made from soda ash to caustic soda. Because Veolia was in control at the time this chemical change happened, it would appear that the change was one of Veolia's recommendations to save PWSA money. Veolia did not inform PA DEP of the change nor did they inform the board of directors at PWSA.

Veolia sold itself as a company familiar with the rules and regulations needed to manage a community water system. The fact that they did not contact the PA DEP when planning to change the corrosive chemical indicates a lack of knowledge in managing a water system.

RECOMMENDATION NO. 46:

Action should be taken against Veolia as they were responsible for the change to caustic soda. This management error of switching corrosive chemicals without informing PA DEP or PWSA board of directors should have never occurred. If a fine is assessed to PWSA because of this PA DEP corrosion control permit violation, Veolia should be the one held responsible to pay it, not PWSA.

With input and insistence from the City Controller, PWSA, on October 12, 2016, filed an arbitration law suit against Veolia. The *Tribune Review* reported that the lawsuit was for "creating problems with faulty water meter, and a change in corrosive chemicals".

PWSA Lead Testing Results for PA DEP

As a result of the PA DEP corrosion control permit violation, PWSA was required to test 100 homes this round of testing. These tests were conducted by PWSA in July 2016.

The PA DEP is concerned with the 90th percentile household level of lead in all tap water samples. This shows whether 10% of the sample was above the action level of 15 parts per billion (ppb). The following table shows the lead tests results for PWSAs testing sample in 2016.

TABLE 15
JULY 2016
LEAD RESULTS IN HOMES

LEAD LEVEL DETECTED (in ppb)	# of HOMES TESTED	PERCENTAGE (%)	CUMULATIVE PERCENTAGE (c%)
No Detection	45	45%	45%
2.1 to 4.6	15	15%	60%
5 to 9.8	7	7%	67%
10 to 14	16	16%	83%
16 to 19	6	6%	89%
22 to 38	7	7%	96%
50-75	4	4%	100%
TOTALS	100	100%	

Source: PA Department of Environmental Protection (PA DEP)

The 90th percentile level of lead reported by the Pennsylvania Department of Environmental Protection in 2016 was 22 ppb. This is 7 ppb above the action level of 15ppb which is considered dangerous. This is what concerns PA DEP.

Finding: In the July 2016 PA DEP sample of 100 homes, there were a total of 17 or 17% of homes that had levels of lead higher than 15 ppb. Four (4) homes had extremely high levels between 50-75 ppb.

2013 Lead Test Result Comparison

Prior to PWSA’s violation, the PA DEP lead testing requirement was to do testing every 3 years. The auditors looked back at the previous sample test results in 2013 and compared them to the current 2016 sample.

In 2013, PWSA only had to test the standard requirement of 50 homes for lead while 100 homes were tested in 2016. The results of the 2013 sample show that 52% of the homes had no detection for lead or trace-lead amounts below .5 ppb compared to 45% in 2016. In 2013, 70% of the sample had lead levels below 3 ppb while 70% of the sample was at or below 4.6 ppb in 2016. The PA DEP 90th percentile lead reading in 2013 was 14.7 ppb, which is only .3 ppb away from action level. This was also 7.3 ppb lower than the 90th percentile lead reading in 2016. There were 5 (10%) homes in 2013 that were over 15 ppb compared to 17 (17%) in 2016.

The PA Department of Environmental Protection sampled testing in 2013 and 2016 shows that homes in the City Of Pittsburgh contain levels of lead in their tap water over 15 ppb which is considered dangerous and levels seems to be getting worse over time.

Finding: Water samples taken in 2016 show that lead levels have increased since 2013. The change in corrosive agent from April 2014 to January 2016 may be a cause.

PWSA Actions to Prevent Lead in Water

As stated previously lead test results with more than 10% of the sample exceeding 15 ppb is not a violation but requires PWSA to take additional steps. PWSA is complying with the PA DEP requirements in several ways which include: customer education efforts, free lead tests, and the Water Quality Initiative Program.

Customer Education Efforts and Free Lead Tests

Beginning in early 2016, PWSA now sends a “Facts About Lead” information sheet that is included with all customers’ monthly bills. This information sheet gives facts about drinking safe water, dangers of lead, and safety precautions customers can take if they are concerned about their water lead level. Some of these precautions include only using cold water for cooking and baby formula (lead dissolves easy in hot water), remove and clean aerator screens, and letting your tap water run 30-60 seconds first to flush out any lead build up in your water from pipes.

The information sheet gives a PWSA lab telephone number that customers can call to request their water be tested for lead. PWSA will send the customer a free lead test kit. All this information is also posted on PWSA’s website. The PWSA website also gives up to date results of the free household lead testing kits, PADEP lead testing results, as well as PWSA’s annual drinking water quality reports and service line replacement numbers to call

Free Lead Tests

PWSA’s free lead test number is located in both the lead information sheet included with your bill and on PWSA’s website. Originally when a customer requested a free lead kit, PWSA would drop off 2 empty bottles of water and a lead testing survey to fill out. The customer is supposed to fill one sample bottle after water has remained stagnant for close to 8 hours. Letting the water remain stagnant for 8 hours should let any lead in the pipes leach into the water.

The second sample should be taken 10 minutes later without turning off the water to flush out any lead contaminated water. PWSA would then pick up the sample when notified by the customer. All samples are sent to a private company named Environmental Services Laboratory for testing so there is no conflict of interest. Results are sent back to PWSA who will then contact the customers and advise them on what options to take based on their homes lead test results. The following table shows the results of the homeowners who participated in the free lead tests from February 15 to June 6, 2016.

TABLE 16

FREE LEAD TEST KIT RESULTS IN HOMES			
LEAD LEVEL DETECTED (in ppb)	# of HOMES TESTED	PERCENTAGE (%)	CUMULATIVE PERCENTAGE (c%)
No Detection	226	57%	57%
1 to 5	72	18%	75%
5.1-9.9	52	13%	88%
10-14.9	26	7%	95%
At or above 15	20	5%	100%
TOTALS	396	100.0%	

Source: PWSA Excel Spreadsheet

The results of the free lead test sample shows that more than half (57%) of the homes tested had no trace of lead in their water. However, 12% of the homes tested had a reading at or above 10 ppb and 20 (5%) of the homes tested had a reading at or over 15 ppb which is considered dangerous and action should be taken.

Fourteen (14) of the homes at this dangerous level had a reading that fell between 15-25 ppb. The other six homes had extremely high traces of lead in their water. These six homes and corresponding neighborhoods were: Squirrel Hill 32.8 ppb, Perry North 37.8 ppb, Brighton Heights 39 ppb, Highland Park 43ppb, Perry North 44ppb, and Southside 88ppb.

The current practice is to call PWSA; they in turn will contact Environmental Services Laboratory to mail the customer the bottles to collect the sample. The packet includes directions on how to collect the sample and materials to mail the sample back to ESL.

Lead Testing Results by Neighborhoods

Every free test result in the database received by the auditors had the corresponding address of the home that was tested. The auditors took the addresses and identified which neighborhood they were located in by using a City neighborhood map. The purpose was to see if there was any relationship between the lead readings and the neighborhoods or streets they are located on. **After reviewing the data, the auditors found no correlation between high or low readings and neighborhoods or streets.** Some homes had no detection of lead while homes on the same street, couple of streets over, or in the same area had a level of detection.

For example, 3 homes located on McClure Avenue in the Brighton Heights section of Pittsburgh had different lead readings. Two of the homes were almost right across the street from each other. One home had a lead reading of 5.9ppb and the other 39ppb. The third home

a couple of blocks down had no detection for lead. Two other homes on nearby streets named Shadeland Avenue and Cabronne Street had no detection for lead.

Finding: The free lead test sample shows the complexity of PWSA solving the lead in the water problem; numbers greatly vary on the same street and within the same neighborhood.

Status of the Free Lead Tests

The free lead tests were originally supposed to expire after a few months but now PWSA has extended the offer to their customers with no expiration date. PWSA currently has 680 more customers who have requested the free lead tests bring the total to 1,076 requests. The results of these 680 homes have not been released.

The 1,076 total requests is a marginal number compared to the 70,470 residential accounts PWSA has with city. Without more volunteers, it is hard to get an accurate picture on how bad the lead problem is in the city. The auditors also found that 38% out of the 396 lead test results came from the neighborhoods of Squirrel Hill, Highland Park, and Point Breeze. More customers from other neighborhoods should be requesting the lead test kits. A home in South Side neighborhood had the highest reading in the sample at 88 ppb but only 8 homes in South Side requested a free lead test kit.

RECOMMENDATION NO. 47:

PWSA needs a better approach at promoting the free lead tests and to educate customers on the dangers of the lead in water. The only way to get an accurate picture of the lead levels in Pittsburgh is to encourage every PWSA customer to have their lines tested.

It was reported in the *Tribune Review* article titled “Pittsburgh Water Customers Frustrated by Long Waits for Lead Tests” on February 7, 2017 that residents were not receiving the free lead tests in a timely manner. According to the *Tribune Review*, customers reported that months had gone by and the testing kits weren’t being received. PWSA estimated that customers should receive results in 3 to 3.5 weeks’ time after the lab receives the sample. “Of the 3,057 water samples that PWSA customers sent to be tested for lead last year, more than half [1,612 samples] took longer than a month to get results, according to authority data the *Pittsburgh Tribune Review* obtained through a right to know law request”, according to the article.

Water Quality Initiative Program

In May 2016, PWSA outlined a Water Quality Initiative Program. The program consists of 8 goals and each month an update on each goal is posted on their website. Some of the objectives were already discussed early in the audit such as continuing to offer the free

lead testing kit program, customer education efforts, and complying with PA DEP lead testing requirement of 100 household water tap lead samples twice in 2016.

The other 5 objectives are the following:

- PWSA is developing a Water Quality Advisory Committee to advise them with their water quality initiatives and lead focused policies. The committee will consist of groups from ACHD, DEP, board representatives, plumbing and academic experts, etc. Orientation for the board is in August 2016.
- Performing pipe loop studies which is when chemicals are flushed through lead pipes for a period of time to see which ones might be effective in PWSA's distribution system. This program was approved and will begin in September 2016.
- Trying to determine lead service lines by having interns looking at old paper records and maps inherited from the city.
- Started a pilot program in Upper Lawrenceville to identify and replace lead service lines. PWSA is digging up streets and replacing lines if they are identified as lead. PWSA will notify customers if their end of pipe ownership is lead and give customers the option to replace it while PWSA has the trench open. Customer will have to pay for the service line replacement but this alternative is a lot cheaper while trenches are already dug. PWSA will also rebury the lines.
- One senior manager was responsible for both water plant operations and water quality. These 2 responsibilities are being split into 2 different positions. Positions are posted for recruitment as of August 2016 for a Deputy Director of Water Production and Chief Water Quality Officer.

PWSA Asset Management Problems

Currently, PWSA uses a Geographic Information System (GIS) mapping software to document water and sewer line repairs/ replacements and their locations throughout the City. In this GIS system, the data is only available beginning with 2011. Prior to 2011, large paper maps were used to look up streets and track water and sewer lines.

A Computerized Maintenance Management System (CMMS) is a software system that tracks and documents water and sewer line repairs, new installations, locations within streets and sidewalks and size of pipes installed. It keeps track of all the physical assets or infrastructure, assists in planning and scheduling maintenance and evaluates the state of the assets.

PWSA approved the purchase of a business management system also known as Enterprise Resource Planning (ERP) software from Cogsdale Corporation in February of 2010 costing upwards of \$2.7 million. The package purchased was expected to support finances,

administration, customer service, and sewer operations. According to an independent audit conducted by Maher Duessel for the City of Pittsburgh, found that implementation of this software from 2010-2013 was done in several steps:

- January 2012- Financial Module went live
- 2012-2013- Customer Service Module (CSM) implementation was ongoing and went live in 2014.

The last discussion found by auditors about the ERP software was in 2013 by a PWSA board member. According to this PWSA board member, “The system is only partially online three years after PWSA approved buying it”. This is due to inefficiency in the system. One of the inefficiencies of the Cogsdale software is a lack of an implemented Computerized Maintenance Management System (CMMS).

In 2011, the City and Allegheny County purchased a joint license for a JD Edwards (JDE) ERP system. By the City being a co-licensee, the City's component units (authorities) would be able to join the City's system at a far lower cost than if the authority would purchase an ERP system on their own. This option was presented to PWSA, however, they decided to go in another direction, despite the cost savings from the already purchased software.

PWSA administration stated that the business management system purchased through Cogsdale is not compatible with the JD Edwards system shared by the City and Allegheny County. Instead of all public works projects being coordinated under one system (CMMS), two systems are being used, causing excess spending on licensing and information technology assistance. Ideally, PWSA would like a CMMS that was compatible with the City and County's JD Edwards system, allowing the coordination of public works projects. For example, if outdated water and sewer lines could be replaced before a street is repaved, that would save the City time and money. A CMMS would allow DPW to do this with the collaboration and coordination of these projects.

Finding: As of the end of August 2016, the authority does not have a CMMS.

It should be noted that PWSA awarded a \$1 million contract for a CMMS in February 2016 (one month before the interim director arrived), but the new interim director and managers concluded that insufficient planning work for its successful implementation emerged. As a result, a notice to proceed to that vendor was not given.

PWSA's management is currently researching CMMS options available. One option being explored is a module in the COGSDALE system that is similar to a CMMS.

RECOMMENDATION NO. 48:

PWSA needs a CMMS to improve their asset management capabilities and accuracy.

Negley Run Watershed and the Washington Boulevard Flooding

A watershed is an area or ridge of land that separates waters flowing to different rivers, basins, or seas. The Negley Run Watershed consists of approximately 3,550 acres of land in several eastern neighborhoods in the City and surrounding towns that currently drains into two trunk sewer lines under Washington Boulevard. As combination type sewers, these pipes carry both sanitary and storm water.

With the increase of development in the area that makes up the watershed and the elimination of pervious ground, additional water is flowing into the Washington Boulevard area during wet weather. However, the capacity of the sewers under Washington Boulevard have not been able to handle this amount of water, causing severe flash flooding which resulted in the death of four people in August 2011.

As a result of the flooding, in 2012 PWSA hired MS Consultants to study various options to address the flooding on Washington Boulevard. The first and second pictures are from the MS Consulting “Final Report for Negley Run Watershed/Washington Boulevard”. The third picture is from WPXI in 2011; it shows the flooding of Washington Boulevard.

Figure 4 on the following page shows the area the Watershed covers. It covers not only Pittsburgh but parts of Penn Hills and Wilkinsburg.

Figure 4
Negley Run Watershed



Source: MS Consulting “Final Report for Negley Run Watershed/Washington Blvd”

Figure 5 shows the water covering Washington Boulevard and cars.

Figure 5
Flooded Washington Boulevard



Source: WPXI

Options explored in the report by MS Consultants can be found in Table 13. These options provide various levels of protection against flooding and related potential future issues. The involvement of various agencies, including but not limited to ALCOSAN, U.S. Army Corps of Engineers, PA Department of Environmental Protections, Allegheny County Health Department, PA Department of Transportation, and the U.S. Coast Guard. MS Consultants included recommendations for various combinations of these alternatives to address the flooding issues.

TABLE 17

OPTIONS OF ALTERNATIVES TO MITIGATE FLOODING OF WASHINGTON BOULEVARD 2012 MS CONSULTANT'S REPORT		
ALTERNATIVE	TYPE OF IMPROVEMENT	ESTIMATED COST
Raise Washington Boulevard 4 ft.	Raise Washington Boulevard	\$1,841,712
Raise Washington Boulevard 6 ft	Raise Washington Boulevard	\$2,262,124
Raise Washington Boulevard 8 ft	Raise Washington Boulevard	\$2,780,502
Raise Washington Boulevard 10 ft	Raise Washington Boulevard	\$3,367,139
Raise Washington Boulevard 12 ft	Raise Washington Boulevard	\$4,014,776
Two direct outfall of sewer into Allegheny River, abandon existing line	Drainage system improvement by outfall to Allegheny River	\$2,153,971
Two direct outfall of sewer into Allegheny River, maintain existing line	Drainage system improvement by outfall to Allegheny River	\$2,245,471
One direct outfall to the Allegheny River upstream of dam	Drainage system improvement by increasing hydraulic capacity	\$1,678,171

TABLE 17 (continued)

OPTIONS OF ALTERNATIVES TO MITIGATE FLOODING OF WASHINGTON BOULEVARD 2012 MS CONSULTANT'S REPORT		
ALTERNATIVE	TYPE OF IMPROVEMENT	ESTIMATED COST
Parallel pipe with new outfall downstream of dam	Drainage system improvement by increasing hydraulic capacity	\$15,103,600
Direct discharge to Allegheny River by recreating historical culvert under Allegheny River Blvd	Drainage system improvement by direct discharge	\$19,341,636
Pipe lining downstream of Highland Ave of brick sewers and modifying gates and weirs obstructions	Drainage system improvement-existing hydraulic characteristics	\$3,180,052
Exchange 90 degree bends in pipes for 45 degree bends in existing system	Drainage system improvement-existing hydraulic characteristics	\$2,403,095
Bending weirs at A-42 diversion structure to collapse above overflow elevation	Drainage system improvement-existing hydraulic characteristics	\$566,750
132" express sewer from Negley Run Blvd	Drainage system improvement with express sewer	\$16,336,105
Bioretention (rain garden)	Watershed and basin improvements with runoff reduction	\$10-\$35 per square foot
Downspout disconnection from storm sewer system (can be improved with bioretention system)	Watershed and basin improvements with runoff reduction	-
Emergency detention basin along Washington Blvd	Watershed and basin improvements through water detention	\$10,000 for above ground facilities, \$300,00 for below ground
Upstream surface storage of storm water	Watershed and basin improvements through upstream storage	Variable
Upstream underground storage of storm water	Watershed and basin improvements through upstream storage	Variable; greater than surface cost

Source: MS Consulting's Report

Washington Boulevard Flood Gates

After the death of four people as a result of flooding, PennDOT installed a system of gates at Washington and Allegheny River boulevards, Washington and Negley Run boulevards and Washington and Highland Drive in October 2011. These gates were designed

to drop and prevent cars from entering the area once sensors detect standing water greater than four inches. Warning signs were also installed in the area. The system cost approximately \$400,000 to install.

One of arms of the gates on Washington Boulevard was damaged in July 2016 after being hit by a vehicle. This gate was not repaired or functioning during another severe storm in August 2016, which again caused the area to flood and become dangerous to cars. Two cars were temporarily stranded in the water. Police cars were dispatched to block the roads after flooding became apparent.

The broken gate was not repaired as the ownership and maintenance responsibilities had not been defined between the City and the State. The State intended to transfer ownership and maintenance responsibility to the City in May 2013. However, the City did not acknowledge the transfer at that time and gate repairs and malfunctions were not addressed. After these issues became public in August 2016, the City stated their intention to take over maintenance of the Washington Boulevard flood gates.

Finding: Despite spending money on the MS Consulting report about suggestions to correct the flooding issue at Washington Boulevard, PWSA has no plans to act on its reconfiguration.

The City of Pittsburgh has agreed to maintain and repair gates that stop cars from entering the under pass at Washington's Boulevard.

Cost of Emergency vs. Contract Repairs

The auditors were told that emergency repairs cost a lot more than a properly bid out schedule of repairs. A list of the last 2 years repairs, both contracted and emergency, and the cost of the repair was requested from the interim director of engineering and construction. While the interim director acknowledged that the information was available it never was delivered to the auditors.

Finding: PWSA is unable to supply documentation about the cost of emergency repairs vs contracted repairs. While common sense dictates that properly bid out repairs should cost less than emergency repairs, data should be available to substantiate the claim.

RECOMMENDATION NO. 49:

PWSA needs to establish a realistic comprehensive line replacement plan of action for both water and sewer lines. A map needs to be made where the most recent emergency repairs have been needed in order to determine a pattern of failure and with that determination plans for future line replacements.

Cooperation with the City Department of Public Works Permit Division

Conversations with PWSA administrators stated that PWSA is the last to be informed of major street development and plans that get the approval of the City's Department of Public Works Permit Division.

Finding: In fact it was noted that a major construction job in Oakland took place and by the time PWSA was asked to review the plans the job was already completed. In this particular instance the water lines were located extremely close to new electrical lines. Despite this safety hazard PWSA was helpless to make the contractor change the design because the City's Department of Public Works Permit Division had already approved the plans.

RECOMMENDATION NO. 50:

PWSA and the City of Pittsburgh's administration must work together to approve new development projects. Between the PWSA board of directors and City council the process must be changed to require input from PWSA's engineers on all blueprints. PWSA might consider scheduling an engineer to review new plans once or twice a week at the City's Permits counter.

PWSA's 40-Year Plan

An RFP was released by PWSA in June 2010 for the creation of a "40-Year Capital Plan and Water and Sewer Master Plan". The contract was awarded to Chester Engineers. The plan was completed in 2011 and was revised in 2012. This plan is a guide for the capital improvements that PWSA will need to complete over the next 40 years along with estimates for the financial resources needed to complete the projects.

The plan is comprised of smaller 5-year Capital Improvement Program plans that address repair and replacement needs of both water and sewer lines. An inventory of PWSA assets was compiled for the report and included the age, type, and general condition of PWSA facilities.

The plan notes that "a significant percentage of the water mains in the PWSA system are more than 70-years of age, a generally accepted estimate of the useful life for cast iron mains". In other words most of PWSA's water lines are at the end of their useful life. Aging infrastructure makes the system more susceptible to failures which increases repair costs.

Table 18 breaks down the costs to replace PWSA infrastructure. As per the 40-Year Plan report, these **costs are based on 2011 construction costs**. A copy of these costs from the report can be found in the Appendix.

TABLE 18

2011 CONSTRUCTION COSTS TO REPLACE PWSA INFRASTRUCTURE	
INFRASTRUCTURE ITEM	REPLACEMENT COST
Existing Waterlines	\$627,042,000
Fire Hydrants and valves	\$84,368,000
Water Treatment Pumping And Storage Facilities	\$539,061,000
Sewer System	\$1,264,877,000
TOTAL	\$2,515,348,000

Source: PWSA 40-Year Plan

During a meeting with PWSA staff, the auditors were told that the 40-Year Plan does not serve as an actual plan for decisions that are made by PWSA. The staff stated that the plan was more like a “wish list”.

Finding: The 40-Year Plan report is not being used by PWSA.

Finding: In order to replace PWSA’s entire infrastructure it will cost a minimum of 2.5 billion dollars and much more at 2017 construction costs.

It is no wonder the staff believes that the 40-Year Plan is a wish list. The thought of raising over 2.5 billion dollars for infrastructure replacement is daunting. The reality is that some of the work has already been completed because PWSA is always doing “emergency repairs”. Poor record keeping as to when and what is fixed makes the overall picture hard to gauge.

Finding: Some infrastructure work has been completed over the years but PWSA lacks documentation to show when, where and what has been fixed.

Due to the outdated nature of the 40-year plan, PWSA has recently initiated a Capital Improvement Plan which evaluates capital needs over the next five to ten years. This program is reevaluated annually in the fall of each year where candidate projects are ranked in terms of criticality and scale. This plan is presented to the Board of Directors each year and the following year’s capital investment activity is determined by the authorized projects within that plan.

RECOMMENDATION NO. 51:

As stated in Recommendation No. 48, PWSA needs a Computerized Maintenance Management System (CMMS) to improve their asset management capabilities and accuracy. If the manpower and training is not available for this type of system then PWSA needs to implement some form of comprehensive asset management system. PWSA administration needs to make this a top priority.

APPENDIX A

Agreement for Interim Management Services between PWSA and Veolia Water

AGREEMENT FOR INTERIM MANAGEMENT SERVICES

THIS AGREEMENT FOR INTERIM MANAGEMENT SERVICES ("Agreement") is made this 14 day of November, 2014 by and between The Pittsburgh Water and Sewer Authority, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania having its principal place of business at Penn-Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, Pennsylvania 15222 (the "Authority"), and

Veolia Water North America-Northeast, LLC, a limited liability corporation organized and existing under the laws of Delaware, having a place of business at 53 State Street, 14th Floor, Boston MA 02109 ("Veolia").

RECITALS:

A. The Authority and Veolia (collectively, the "Parties") were parties to an Agreement for Interim Management Services dated July 12, 2012, pursuant to which Veolia provided the Authority with interim management and consulting services including executive management services, general administration and management consulting services, and financial and infrastructure management consulting services (the "2012 Agreement").

B. During the term of the 2012 Agreement, Veolia pursued and the Authority approved many of the early objectives and projects contemplated by the 2012 Agreement and, in order to continue and expand upon those initiatives, the Parties entered into a second Agreement for Interim Management Services having a term from July 15, 2013, through December 31, 2014 (the "2013 Agreement").

C. As under the 2012 Agreement, under the 2013 Agreement, Veolia was to provide and is providing executive management services, general administration and management consulting services, and financial and infrastructure management consulting services to the Authority.

D. In addition to those services contemplated by the 2013 Agreement, the Authority wishes Veolia to assist the Authority with the recruitment and hiring of management personnel, and to assist with the training and development of the new directors and managers so as to assure continuity and stability of the Authority's management upon the expiration of this Agreement.

E. The Authority desires to engage Veolia upon the terms and conditions hereinafter set forth, and Veolia is willing to accept the engagement upon such terms and conditions.

NOW, THEREFORE, in consideration of the mutual premises set forth below and intending to be legally bound hereby, the Parties agree as follows:

ARTICLE 1-AGREEMENTS BETWEEN THE PARTIES

As of the Effective Date (defined below) of this Agreement, the 2013 Agreement is terminated and, except as specifically provided for herein, all obligations of the Parties thereunder shall cease.

ARTICLE 2 -- SCOPE OF SERVICES

2.1 Operating. The Authority hereby engages Veolia as an independent contractor to continue to perform the services set forth in its Technical Proposal dated May 4, 2012 (the "Technical Proposal"), which is incorporated herein by reference, including those services outlined and described as the Veolia Water Recommended Approach. The Parties understand that Veolia has completed the initial evaluation, analysis, and planning services contemplated by the Technical Proposal, and agree that Veolia shall continue to pursue and implement projects and processes identified and/or approved during the term of the 2013 Agreement and not yet fully implemented. Further, the Parties understand and agree that Veolia shall continue to use the same collaborative approach in identifying, analyzing, developing, and implementing other improvements to the Authority's operations during the Term of this Agreement. Those services contemplated by the Technical Proposal, as revised by this Section 2.1, shall hereinafter be referred to as the "Services." Veolia hereby agrees to perform the Services upon the terms and conditions hereinafter set forth. Veolia shall furnish all necessary management, supervision, and personnel as may be necessary to provide the Services. The Services shall include collaboration with and assistance to Authority personnel, and shall include:

2.1.1 the services of a full time, on site, interim executive director, described as an Interim Executive Manager in the Technical Proposal ("Interim Executive Director"). The responsibilities and authority of the Interim Executive Director are more particularly described on Exhibit A attached hereto and incorporated herein;

2.1.2 the services of a full time, on site, interim finance director ("Interim Finance Director");

2.1.3 the services of a full time, on site, interim Chief Operating Officer ("Interim Chief Operating Officer");

2.1.4 the consulting services described on Exhibit B attached hereto and incorporated herein as defined and described in the Technical Proposal; and .

2.1.5 the efficient and effective management of the Authority's operations, including but not limited to, surface restorations following repair or replacement of the Authority's water, sewer, or stormwater facilities; and the cleaning and repair of the Authority's catch basins and other stormwater intakes.

2.1.6 In the event of any disparity between the Technical Proposal and the Exhibits, the provisions of the Exhibits shall control.

2.2 Personnel.

2.2.1 The Parties agree that Jim Good has particular qualifications to perform the Services of Interim Executive Director and Joey Tolbert has particular qualifications to perform the services of Interim Finance Director. Commencing as of the Effective Date and through the transition following the hire of permanent employees, as provided in Section 2.3 below, Mr. Good and Mr. Tolbert shall not be removed or reassigned without the prior written approval of the Authority.

2.2.2 The Parties agree that the position of Interim Chief Operating Officer will be filled by a Veolia employee reasonably satisfactory to the Authority. Subject to the Authority's approval, Veolia will exercise reasonable efforts to retain the same individual in the position of

Interim Chief Operating Officer from the Effective Date through the transition addressed in Section 2.3 below.

2.2.3 At the request of the Authority, acting reasonably, personnel supplied by Veolia deemed by the Authority to be unqualified or otherwise objectionable due to performance or other reasons shall be excluded from performing the Services. Provided, however, that prior to any such request for exclusion, the Authority shall seek to address any issues that it has with Veolia personnel pursuant to the procedures set forth in Section 21.1 through 21.3.

2.2.4 The Interim Executive Director may assign Authority personnel as necessary and appropriate to assist in the evaluation and implementation Services described in the Technical Proposal and in Exhibit B. The Authority will support the involvement of its division directors and other staff in workshops, for the supply of data, to integrate with Veolia personnel in identifying and implementing initiatives, and to otherwise support the Services provided by Veolia.

2.3 Executive Recruitment and Transition Services. Commencing with the Effective Date and continuing as necessary throughout the Term (defined below), Veolia shall provide the Authority with executive recruitment and transition services, as follows:

2.3.1 Veolia shall recruit, research, assess, interview, and present to the Authority Board for consideration candidates for the positions of Finance Director and Chief Operating Officer. With the prior approval of the Steering Committee and the Authority Board of Directors, the Authority will retain one or more executive recruiting firms as necessary and appropriate to the search.

2.3.2 The Interim Finance Director and the Interim Chief Operating Officer shall provide services related to the orientation and training of his successor Finance Director and Chief Operating Officer. Those services shall commence on the day the successor Finance Director or Chief Operating Officer commences employment and shall continue for 60 calendar days thereafter unless the Parties mutually agree to a period of different duration.

2.3.3 Veolia shall provide such assistance as the Authority Board may reasonably request in the recruitment of an Executive Director.

2.3.4 The Interim Executive Director shall provide services related to the orientation and training of his successor Executive Director. The services shall commence on the day the successor Executive Director commences employment and shall continue for ninety (90) days or the Parties may mutually agree to a period of different duration.

2.4 Steering Committee. The Services shall be performed under the general supervision of a Steering Committee, which shall meet or otherwise confer upon such frequency as the majority of those serving on the Steering Committee may determine. The Authority shall have the right to appoint three (3) representatives to the Steering Committee, who shall serve at the pleasure of the Authority. As of the Effective Date, the Authority's designees to the Steering Committee are Alex W. Thomson, Paul Leger, and Caren Glotfelty; and Veolia's designees to the Steering Committee are Keavin Nelson and Rob Nicholas. Should any member of the Steering Committee be unable to serve on the Committee for any reason, the Party designating that person shall designate his or her replacement. Meetings of the Steering Committee may be in-person or through electronic means such as telephone or internet conferencing.

2.5 Reporting. The Interim Executive Director shall maintain detailed records on actions taken and planned on behalf of the Authority and shall submit reports to the Steering Committee on a weekly basis, or on such other frequency as the Steering Committee shall reasonably determine. The Interim Executive Director shall report to the Steering Committee on progress toward the Authority's objectives as established by the Steering Committee and the Authority's Board. The Interim Executive Director, the Interim Finance Director, other of Veolia's representatives, and Authority staff as directed or requested, shall attend such meetings of the Steering Committee or the Authority's Board as the Authority may reasonably request.

2.6 Conflict of Interest. Veolia represents that it presently has no conflicting interest, agreements, or obligations and reasonably expects none to occur. During the Term of this Agreement, Veolia agrees not to engage in any activities that may reasonably be expected to conflict with the Services to be provided hereunder without the Authority's prior written consent.

2.7 Limitations on Scope of Services. Notwithstanding Veolia's agreement to provide the services of an Interim Executive Director and other personnel as part of the Services, the Authority will at all times be ultimately responsible for the operation and maintenance of its facilities, including each of the following:

2.7.1 Ultimate responsibility for compliance with all applicable permits, authorizations, consent decrees, regulations, and all other applicable laws at the facilities, including without limitation environmental, employment, health and safety, and other legal requirements;

2.7.2 Operations, maintenance, and capital improvements related to the facilities;

2.7.3 Purchase of equipment, supplies, chemicals, utilities, and any other costs associated with the operation, maintenance, or capital improvements of its facilities;

2.7.4 Ultimate responsibility for all PWSA employees and subcontractors and direct management of union employees; and

2.7.5 Employment of all operations and maintenance ("O&M") staff and other employees at the Authority's facilities other than the Veolia employees, agents and subcontractors.

2.8 Contract for Consulting Services. Prior to the end of the Term and any Additional Term or Terms, the Authority and Veolia may negotiate a contract for on-going consulting services by Veolia.

ARTICLE 3-- TERM

This Agreement is effective as of January 1, 2015, and, unless earlier terminated in accordance with the provisions hereof, shall continue in effect through December 31, 2015 (the "Term"). The Agreement shall be automatically extended for two (2) additional six (6) month terms ("Additional Term(s)") unless the Authority terminates at the end of the then-current Term or Additional Term by giving at least ninety (90) days' notice of termination to Veolia.

ARTICLE 4-- COMPENSATION

4.1 Base Compensation. For the performance of the Services, the Authority will pay Veolia a Base Compensation of--

4.1.1 One hundred twenty thousand (\$120,000.00) dollars per month, which shall include costs and expenses, for the months of January 2015 through June 2015.

4.1.2 In July 2015 and continuing through December 2015, this Base Compensation shall be reduced to one hundred thousand (\$100,000.00) dollars per month. Provided, however, that if Veolia has presented the Authority with three (3) or more qualified candidates for the positions of Finance Director and Chief Operating Officer and the Authority has declined to hire these candidates, then Veolia's Base Compensation shall continue at one-hundred twenty (\$120,000.00) per month until a Finance Director and Chief Operating Officer are hired. The Parties shall resolve any dispute about the qualifications and suitability of candidates presented by Veolia pursuant to the procedures set forth in Sections 21.1 through 21.3.

4.1.3 During the first Additional Term, should there be one, Veolia's Base Compensation shall be seventy-five thousand (\$75,000.00) dollars per month, which shall include costs and expenses.

4.1.4 During the second Additional Term, should there be one, Veolia's Base Compensation shall be fifty thousand (\$50,000.00) dollars per month, which shall include costs and expenses.

4.2 Performance Compensation. In addition to the Base Compensation, Veolia may earn performance compensation, as follows:

4.2.1 Key Performance Indicators (KPIs)

4.2.1.1 Veolia and the Authority will work together to develop KPI's and to implement a maximum of four (4) KPI's acceptable to the Board. The KPI's will be developed through workshops and added as agreed by Veolia and the Authority. Compensation for all KPI's implemented through the Term of this Agreement will not exceed four hundred thousand (\$400,000.00) dollars and for each Additional Term, if any, shall not exceed two hundred and fifty thousand (\$250,000.00) dollars.

4.2.1.2 Each KPI will have a well-defined and measurable objective against which achievement may be measured. KPI's may be multi-focused, sliding scale, and/or subdivided into more than one initiative, as was the practice with those KPI's approved and implemented during the term of the 2012 Agreement and the 2013 Agreement.

4.2.1.3 The Authority and Veolia will reach a final decision on the KPIs to be implemented and the objectives and milestones to be achieved no later than March 15, 2015.

4.2.2 Improvement Initiatives

4.2.2.1 Veolia and the Authority will work jointly to evaluate opportunities for efficiencies, and where potential improvements are identified they will submit business case reports to the Steering Committee for approval on an ongoing basis (the "Recommended Initiatives"). Each business case will outline how savings are measured for that particular Recommended Initiative (e.g. metering of utility usage, measurement of reduced chemical consumption, etc.).

4.2.2.2 Those Recommended Initiatives that are approved by the Steering Committee will be presented to the Board for formal approval. Once presented, the Board will consider each Recommended Initiative and will either approve, reject, or modify such Recommended Initiative within 30 days. For each Recommended Initiative that is approved, Veolia will work with the Authority to implement it.

4.2.2.3 Subject to Section 4.2.2.5 below, Veolia and the Authority will share equally in the savings achieved from Recommended Initiatives approved, or identified and in the process of approval, during the term of the 2012 Agreement and the 2013 Agreement, however and whenever implemented, during the Term of the 2012 Agreement and through June 2016.

4.2.2.4 Savings achieved from Recommended Initiatives identified and approved during the Term of this Agreement shall be paid sixty percent (60%) to the Authority and forty (40%) percent to Veolia over a period to be determined, for each Recommended Initiative, by the Steering Committee and approved by the Authority Board, not to exceed two (2) years from the Effective Date of this Agreement.

4.2.2.5 Shared savings will be determined and paid in accordance with the procedures set forth in Exhibit B. Provided, however, that Veolia's total compensation attributable to approved Recommended Initiatives in 2015 shall not exceed three million five hundred thousand (\$3,500,000.00) dollars, and its total compensation attributable to approved Recommended Initiatives during 2016 shall not exceed two million five hundred thousand (\$2,500,000.00) dollars. After January 1, 2017, all savings will inure solely to the benefit of the Authority. During the time period in which Veolia is sharing in savings, in consideration for the compensation received Veolia will at its own expense conduct an annual review of all implemented Recommended Initiatives to confirm the savings and operational status of each. Veolia will submit a report to the Authority Board of Directors summarizing the status of each effort along with any recommendations that may be considered in order to ensure or enhance the sustainability of each.

4.2.2.6 Though Veolia and the Authority may continue to identify Recommended Initiatives throughout the Term and any Additional Term or Terms, in January 2015 Veolia will present a consolidated report of Recommended Initiatives that have been presented, are at that time before the Board, or are in the process of being developed and expected to come before the Board.

4.2.2.7 Both Veolia and the Authority agree that reorganization or restructuring plans that affect headcount may be presented for Board consideration, but such plans and the cost savings associated with the plans shall not be considered as Recommended Initiatives. However, Veolia and the Authority may elect to include the preparation of such reorganization or restructuring plans as a KPI under Section 4.2.1.

4.3 Audit. Upon request, the Authority shall provide such access to its facilities and books and records, and those of its subcontractors or subconsultants, as Veolia may require for inspection and/or audit purposes to substantiate savings from KPI's and other shared savings from improvements implemented pursuant to this Agreement for a period of two (2) years following the expiration or termination of this Agreement.

4.4 Additional Services. Should the Authority desire additional services, over and above those Services detailed in Article 2 and the Exhibits to this Agreement, those additional services shall be engaged and charged on a mutually agreeable and negotiated basis. No additional services shall be undertaken by Veolia without a written agreement or amendment duly executed by the Authority.

4.5 No Withholding. All sums of money paid to Veolia pursuant to this Agreement shall be paid without deduction or withholding of federal or state payroll or employment taxes of any kind or nature including but not limited to, income taxes, social security taxes, unemployment insurance taxes, disability insurance taxes and similar items, and shall be evidenced by one or more Forms 1099 issued by the Authority to Veolia in accordance with applicable law.

4.6 Invoicing and Payment.

4.6.1 Base Compensation and Related Charges

Veolia will prepare and submit an invoice for the Base Compensation and for any other agreed charges payable by the Authority on a monthly basis throughout the Term and any Additional Term or Terms. Invoices shall be approved by the Steering Committee and paid by the Authority on a net-30 basis.

4.6.2 Performance Compensation

4.6.2.1 Because the temporal scope and the means of determining success may vary with each K.PI, compensation based on K.PIs shall be calculated and paid on such a timetable and in such a manner as indicated in each approved KPI.

4.6.2.2 Compensation based on shared savings from implementation of Recommended Initiatives shall be calculated and paid monthly based on actual net savings as data is available, and shall be subject to reconciliation on an annual basis during the shared savings time period.

4.6.2.3 For the purposes of this Agreement, "net savings" shall be determined as follows:

In any instance where the implementation of a Recommended Initiative requires the creation of a capital asset, the net savings shall be calculated as follows: gross savings minus debt service costs. Debt service costs shall be calculated for the total project cost, including costs related to direct engineering, procurement, and installation of the improvement (the "Project Cost"), of each capital asset based on a level debt service assumption for a term equivalent to the period of probable usefulness of the asset financed.

In any instance where the implementation of a Recommended Initiative requires the purchase of equipment that must be expensed as such expense is incurred, net savings shall mean the gross savings minus the equipment expense.

In any instance where the implementation of a Recommended Initiative requires additional life-cycle or additional ongoing O&M costs, net savings shall mean the gross savings minus the annual average of any projected associated additional life-cycle or additional ongoing O&M costs.

ARTICLE 5 - RELATIONSHIP OF PARTIES

5.1 Independent Contractor. It is understood by the Parties that Veolia is an independent contractor and is retained by the Authority only for the purposes and to the extent set forth in this Agreement. Veolia is to be considered the agent of the Authority only as contemplated by the scope of Services set forth in Exhibit A. Veolia is not authorized to bind the Authority in any manner or to incur any obligation, expenditure or liability on behalf of or against the Authority, or to make any representation or warranty on behalf of the Authority, without the prior authorization of the Steering Committee and, where appropriate, the Authority's Board of Directors.

5.2 No Benefits. Veolia, its employees and agents, are not employees of the Authority. The Authority will not provide employee benefits or entitlements of any kind or nature, including health insurance benefits, paid vacation, or any other benefits for Veolia or its employees or agents. Neither Veolia nor its employees or agents are eligible for unemployment or workers' compensation benefits from the Authority.

ARTICLE 6 - REPRESENTATIONS

6.1 Service Standards. Veolia shall perform the Services with due diligence in a good and workmanlike manner in accordance with the standards, practices, and procedures that would be reasonably expected from an experienced service provider in the industry or profession for the areas anticipated by this Agreement. Veolia shall be responsible for the technical accuracy of its Services and documents resulting therefrom, including those of any of its subcontractors or subconsultants, and the Authority shall not be responsible for discovering their deficiencies.

6.2 Engineering Services. If the Services include professional engineering services, all such Services shall conform to sound professional and state-of-the-art engineering, design, and drafting practices and procedures, and shall be free from any and all errors, omissions, or defects. Because it is not presently anticipated that Veolia's scope of Services will include professional engineering services, Veolia and the Authority will agree in writing with respect to any project that will include such within its scope.

6.3 Payment to Subcontractors. Veolia shall promptly pay all of its subcontractors, subconsultants, and other persons it engages to perform the Services. Should Veolia fail to do so, the Authority may after notice to Veolia and a failure by Veolia to cure, retain out of any payment due Veolia an amount sufficient to discharge the same.

6.4 Inspection, Audit. Upon request, Veolia shall provide such access to its facilities and books and records, and those of its subcontractors or subconsultants, as the Authority may require for inspection and/or audit purposes for a period of two (2) years following the termination or expiration of this Agreement. For the purposes of clarity, this Section 6.4 shall not apply to the base Services provided for in this Agreement but instead shall apply only to Services provided at a "cost" or "cost-plus" basis.

ARTICLE 7--INSURANCE

7.1 Coverages required-Veolia. Prior to beginning any Services under this Agreement, Veolia shall deliver to the Authority certificates of insurance evidencing the following minimum coverages:

7.1.1 Workers compensation insurance at statutory limits and employer's liability insurance with limits of five hundred thousand (\$500,000.00) dollars. Veolia will have attached to its policy an alternate employer endorsement naming the Authority and will provide a waiver of subrogation in favor of the Authority.

7.1.2 Commercial general liability insurance with limits of two million (\$2,000,000.00) dollars each occurrence and five million (\$5,000,000.00) dollars in the aggregate and containing or endorsed to contain the following coverages: contractual liability; broad form property damage; personal/advertising injury; an endorsement including the Authority as an additional insured, waiver of subrogation to the benefit of all additional insureds as respects any claims covered or which should have been covered by valid and collectible insurance including any deductibles or self-insurance maintained thereunder; no explosion, collapse or underground exclusion; and, for any claims related to the Services, provision that Veolia's insurance shall be primary and non-contributory and any insurance or self-insurance maintained by the Authority shall be excess of Veolia's insurance and not contribute with it. Additional insured status shall be provided in favor of the Authority as respects claims or liabilities to the extent caused by Veolia's work, operations and completed operations, and only to extent of liabilities assumed by Veolia under the Agreement.

7.1.3 Automobile liability insurance with limits of one million (\$1,000,000.00) dollars per accident for bodily injury and property damage covering all owned, hired, and non-owned vehicles. The policy shall be endorsed to include the Authority as an additional insured and to include waiver of subrogation to the benefit of additional insureds as respects any claims covered or which should have been covered by valid and collectible insurance including any deductibles or self-insurance maintained thereunder.

7.1.4 Employee Dishonesty, Third Party Fidelity Bond, and Inside/Outside Money and Securities coverages for Authority-owned property in Veolia's care, custody, or control with limits of one million (\$1,000,000.00) dollars.

7.1.5 If Veolia is performing any professional services for the Authority, professional liability insurance with limits of two million (\$2,000,000.00) dollars per claim or occurrence and five million (\$5,000,000.00) dollars annual aggregate. The policy shall be endorsed to include a waiver of subrogation to the benefit of the Authority as respects any claims covered or which should have been covered by valid and collectible insurance including any deductibles or self-insurance maintained thereunder. If coverage is on a claims-made form, Veolia shall maintain continuous coverage or shall exercise an extended discovery period for at least two (2) years following the expiration or other termination of this Agreement.

7.2 Coverages required-Authority. During the Term of this Agreement, the Authority shall carry the following coverages:

7.2.1 Workers compensation insurance at statutory limits and employer's liability insurance with limits of five hundred thousand (\$500,000.00) dollars, and will include a waiver of subrogation to the benefit of Veolia.

7.2.2 Not-for-profit directors and officers liability insurance providing coverage to insured persons and the organization, with limits of one million dollars (\$1,000,000.00) per claim and annual aggregate. The policy shall be endorsed to include a waiver of subrogation to the benefit of Veolia as respects any claims covered or which should have been covered by valid and collectible insurance including any deductibles or self-insurance maintained thereunder, and will include the Interim Executive Director and Interim Chief Operating Officer as insured persons under the policy. If coverage is on a claims-made form, the Authority shall maintain continuous coverage or shall exercise an extended discovery period for at least two (2) years following the expiration or other termination of this Agreement.

7.2.3 "All Risk" property insurance covering the Authority's facilities and physical assets. The policy shall be endorsed to include a waiver of subrogation to the benefit of Veolia as respects any claims covered or which should have been covered by valid and collectible insurance including any deductibles or self-insurance maintained thereunder.

7.3 Policy duration. Except where stated otherwise in Subsections 7.1 and 7.2 above, the policies or coverages required by this Section shall be maintained during the Term and any Additional Term or Terms of this Agreement.

7.4 Ratings. All insurance coverages must be placed with insurance carriers having an AM Best rating of A- or equivalent rating.

7.5 Notice to Authority. Veolia shall, within three (3) business days of receipt of notice from any insurer with respect to a policy required by Section 7.1 that coverage will be suspended, voided, cancelled, or certificate holder be deleted as an additional insured, provide written notice to the Authority by certified mail, return-receipt requested. During the Term of this Agreement, Veolia shall provide the Authority with certificates for all renewal or replacement policies required by Section 7.1. Notwithstanding the fact that it has been in compliance with this Section, nothing herein shall excuse Veolia from carrying the required insurance under this Agreement and a failure to do so shall constitute a breach.

7.6 Deductibles. All deductibles and self-insured retentions under policies required by this Article 7 shall be the responsibility of the named insured.

7.7 Certificates of Insurance. Upon either Party's request at any time, the other Party shall provide certificates of insurance evidencing coverage. The failure of either Party to pursue or obtain any certificate of insurance or to point out any non-compliance of any certificate of insurance shall not constitute a waiver of any of the insurance requirements of this Agreement or relieve either Party of any of its obligations hereunder.

7.8 Self-insurance. Self-funded or other non-risk transfer insurance mechanisms are not acceptable to the Authority. If Veolia has such a program, full disclosure must be made to the Authority prior to any consideration being given.

7.9 Distinct obligation. These insurance provisions are intended to be a separate and distinct obligation on the part of each Party. The insurance submitted by a Party does not relieve or decrease in any way the liability of that Party for performance under this Agreement.

ARTICLE 8 -- INDEMNITY

8.1 Ordinary negligence. Subject to Section 8.2 below, to the fullest extent permitted by law, Veolia shall indemnify, defend, and hold harmless the Authority, its officers, directors, agents and employees, from and against claims, damages, losses and expenses for bodily injury, death, or physical injury to tangible property, or the loss of use thereof, caused or allegedly caused by or arising from the performance of Veolia under this Agreement, but only to the extent caused or allegedly caused in part by the negligent acts or omissions or intentional misconduct of Veolia, its employees, agents or persons for whose acts Veolia may be liable.

8.2 Professional negligence. To the fullest extent permitted by law, Veolia shall indemnify and hold harmless the Authority, its officers, directors, agents and employees, from and against claims, damages, losses and expenses, including reasonable attorneys' fees and other costs of defense, arising out of or resulting from the performance of the professional services of Veolia under this Agreement, but only to the extent caused in whole or in part by the negligent acts or omissions of Veolia, its employees, agents or persons for whose acts Veolia may be liable.

8.3 Violations of law. To the fullest extent permitted by law, Veolia shall indemnify, save and hold harmless, and defend the Authority, its officers, directors, agents and employees from all liens, charges, claims, demands, losses, costs, judgments, liabilities and damages of every kind and nature whatsoever, including, but not limited to, court costs and attorney's fees arising from or based upon any violation by Veolia of any applicable laws, regulations, ordinances or codes.

8.4 Actions exceeding authority. To the fullest extent permitted by law, Veolia shall indemnify and hold harmless the Authority, its officers, directors, agents and employees from all claims, damages, losses, and expenses, including reasonable attorneys' fees and other costs of defense, arising out of or resulting from the acts of the Interim Executive Director that are outside the scope of his authority as set forth on Exhibit A and approved by the Steering Committee.

8.5 Waiver of workers' compensation bar. The defense and indemnification obligations accepted by Veolia under this Article 8 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by Veolia, or by Veolia's subcontractors or permitted assigns, pursuant to any applicable workers' compensation statute or disability benefit statute or any other employee benefit law, rule, or regulation.

8.6 Mitigation. The Authority agrees to take reasonable efforts to mitigate or reduce any losses that it may suffer or incur and for which it may seek indemnification from Veolia.

ARTICLE 9-INTELLECTUAL PROPERTY

9.1 Veolia Intellectual Property. Subject to Sections 9.2 through 9.4 below, the Authority agrees that Veolia shall be entitled to all right, title, and interest in and to all ideas, conceptions, discoveries, inventions, improvements, designs, methods, techniques, processes, and software, whether or not subject to patent or copyright protection, that are developed by Veolia alone, with the Authority or jointly with others as part of the Services under the 2012 Agreement, the 2013 Agreement, or this Agreement ("Veolia Intellectual Property"). Veolia hereby grants to the Authority, upon the terms and conditions specified in this Article 9, a license in, to, and for the use of the Veolia Intellectual Property. The license granted hereunder is irrevocable, coupled with an interest, perpetual and, except as hereinafter provided, non-exclusive. Except as specified below, the Authority shall have the right, in its sole discretion, to use all or any portion of the Veolia Intellectual Property on other projects, including projects submitted to other consultants. In the event of any such use of any Veolia Intellectual Property by the

Authority, to the extent allowed by laws, the Authority shall defend, indemnify, and hold harmless Veolia, its subconsultants, agents and employees, from any and all claims, damages, losses, and expenses, including reasonable attorneys' fees and other costs of defense, arising out of or in connection with, or caused on account of, such re-use of any such Veolia Intellectual Property, but the foregoing indemnity shall not extend to any liability of Veolia with respect to the initial preparation or creation of the Veolia Intellectual Property.

9.2 Proprietary Works. The license granted by Veolia to the Authority under Section 9.1 above shall be exclusive with respect to those portions of the Veolia Intellectual Property that constitute the Authority's proprietary information ("Proprietary Works"). Proprietary Works refer to those portions of the Veolia Intellectual Property that contain information or data reflecting or relating to: (a) geographic, operational, or technical information with respect to the water, sewer, or stormwater systems operated by the Authority, publication of which could jeopardize its operation or safety; (b) inventions, discoveries, patents, and applications for patents, copyrightable work, and related trade secrets of the Authority as of the date of this Agreement; (c) project deliverables and other data reviewed or developed during the performance of the Services; (d) information related to the Authority's customers; and (e) and other data or information unique to the Authority that is protected from disclosure under Pennsylvania's Right to Know Act (collectively, the "Proprietary Information"). No part of the Proprietary Works shall be used by Veolia on any other project unless, and only to the extent, such Proprietary Works have subsequently, pursuant to applicable laws and not to the act or neglect of Veolia, become available in the public domain by acts of the Authority. Except for the foregoing, Veolia shall keep confidential, as a trade or business secret, all Proprietary Works.

9.3 Veolia Intellectual Property-Patent or Copyright. Notwithstanding the grant of license hereunder, Veolia shall retain any copyright or similar claim in the Veolia Intellectual Property to the extent actually produced by Veolia and its subconsultants, agents, and employees, or any of them, but shall have no claim to any portion of the Proprietary Works, such claims being reserved exclusively by the Authority. Veolia, its subconsultants, agents and employees, their successors and assigns, shall have no right to compensation, royalties or other fees from the Authority, its successors and assigns, due to any claimed proprietary interest in the Veolia Intellectual Property.

9.4 Authority Intellectual Property. Veolia agrees that the Authority shall be entitled to all right, title, and interest in and to all ideas, conceptions, discoveries, inventions, improvements, designs, methods, techniques, processes, and software, whether or not subject to patent or copyright protection, that are developed by the Authority alone, without the participation of Veolia, during the Term of the Agreement and thereafter ("Authority Intellectual Property"). The Authority hereby grants to Veolia a license in, to, and for the use of the Authority Intellectual Property developed during the terms of the 2012 Agreement and the 2013 Agreement and the Term and any Additional Terms of this Agreement without compensation, royalties or other fees. Veolia's license to use the Authority Intellectual Property shall expire or terminate upon the expiration or termination of this Agreement. Thereafter, the Parties may negotiate reasonable and customary license fees if Veolia wishes to use Authority Intellectual Property.

9.5 Applications and assignment.

9.5.1 The Authority will execute, acknowledge, and deliver at the request of Veolia all papers, including patent and copyright applications and related assignment, that may be required for obtaining a patent, copyright or other protection of the Veolia Intellectual Property and for vesting title in Veolia and, at Veolia's cost, shall do all other acts and things that may be reasonably necessary to achieve that purpose.

9.5.2 Veolia will execute, acknowledge, and deliver at the request of the Authority all papers, including patent and copyright applications and related assignment, that may be required for obtaining a patent, copyright or other protection of the Authority Intellectual Property and for vesting title in the Authority and, at the Authority's cost, shall do all other acts and things that may be reasonably necessary to achieve that purpose.

9.6 Others' intellectual property. In performing the Services, Veolia shall not include or provide to the Authority any matter subject to patent, copyright, or other intellectual property protection unless Veolia obtains the written approval of the Stealing Committee and provides the Authority with a license or other written permission of the owner of the intellectual property for Veolia or the Authority to use such protected matter.

9.7 Indemnity. To the fullest extent permitted by law, Veolia shall indemnify, defend, and hold harmless the Authority, its officers, agents, and employees from any infringement or claim of infringement by the Services or any part of the Services, whether provided under the 2012 Agreement, the 2013 Agreement, or this Agreement, of any patent, copyright, trade secret or other third-party intellectual property right. Veolia agrees to pay all royalties and license fees that may be due upon the inclusion of any patented or otherwise infringing materials in the Services. At its sole option, the Authority may be represented by and actively participate through its own counsel in any such infringement suit or proceeding, and the costs of such representation shall be paid by Veolia. Without in any way limiting the Authority's rights and Veolia's obligations, in the event that the Services or any part of the Services is held to constitute infringement or its use is enjoined, Veolia shall, at the Authority's option and Veolia's sole expense, in a timely manner: (a) procure for the Authority a license or other right to continue using the affected Services; (b) replace the affected Services with a substantially equivalent non-infringing property or process; or (c) modify the Services or part of the Services so it becomes non-infringing but is substantially, functionally equivalent.

ARTICLE 10-CONFIDENTIALITY

10.1 Proprietary Information. Veolia will not, either during or after performance of the Services, except as required in the performance of the Services or with the prior written consent of the Authority, communicate or divulge to, or use for the benefit of Veolia or any other person, firm, association, or corporation, any Proprietary Information of the Authority. Veolia acknowledges and agrees that the Proprietary Information may include information that Veolia develops as well as information that Veolia learns from the Authority.

10.2 Veolia Confidential Information. The Authority will not, either during or after performance of the Services, except with the written consent of Veolia, communicate or divulge to, or use for the benefit of any other person, firm, association, or corporation, any confidential or proprietary information of Veolia, including technical information in respect to the products and services of Veolia, its business methods, product design information, market research and studies, future plans, business affairs, pricing, margins, discounts and costs, or related trade secrets (the "Veolia Confidential Information"). The Authority acknowledges and agrees that the Veolia Confidential Information may include information that the Authority develops as well as information that the Authority learns from Veolia.

10.3 Advertising and publicity. Veolia may not use the Authority's name in advertisements, news releases, publicity statements, web sites, interviews, articles, brochures, client listings or other advertising or marketing materials without the prior written consent of the Authority, which consent shall not be unreasonably withheld. Provided, however, that this Section 10.3 shall not

prevent Veolia from making reference to this engagement where such reference is limited to previously disclosed public facts.

ARTICLE 11-LIMITATION OF LIABILITY

11.1 Limitation of liability. Beyond the cost of furnishing replacement Services, and notwithstanding any other provision in this Agreement, Veolia's aggregate liability to the Authority for any and all claims and losses whatsoever resulting from or in any way attributable to errors, omissions, or other acts of Veolia, its subcontractors, agents, and employees, other than as covered by collectible insurance, shall not exceed the amount received by Veolia under this Agreement.

11.2 Waiver of consequential damages. Except as covered by collectible insurance, in no circumstance shall either Party or any of its officers, directors, agents, employees, subcontractors, consultants or subconsultants be liable to the other or the other's successors or assigns, for remote, incidental, indirect, or consequential damages or special loss or damage of any kind, whether or not foreseeable, including, but not limited to, loss of profits, increased expenses or costs in excess of estimates. Any protection against liability for losses or damages afforded any individual or entity by these terms shall apply whether the action in which recovery of damages sought is based on contract, tort (including sole, concurrent or other negligence and strict liability of any protected individual or entity), statute or on any other theory. To the extent permitted by law, any statutory remedies which are inconsistent with these terms are waived.

ARTICLE 12-COMPLIANCE WITH LAWS

In the performance of the Services, Veolia shall comply with all applicable laws, ordinances or regulations of any government authority or agency having jurisdiction ("Applicable Laws").

ARTICLE 13-ANTI-DISCRIMINATION

Veolia shall not discriminate in its employment on the basis of race, color, religion, ancestry, national origin, place of birth, sex, age, disability, non-job related handicap or sexual orientation. Veolia shall comply with the applicable provisions of the Pittsburgh Code, Title Six - Conduct, Article V - Discrimination, and any amendments thereto. Veolia shall also comply with the applicable provisions of Title I and Title II of the Americans with Disabilities Act, any amendments thereto and any regulations issued thereunder. Veolia shall incorporate in any subcontracts which may be permitted under the terms of this Agreement a requirement that said subcontractors also comply with the provisions of this Section.

ARTICLE 14-DISADVANTAGED BUSINESS ENTERPRISES

It is the Authority's current goal to encourage increased minority and women's participation in all Authority contracts. It is believed that it is reasonable to expect that minority participation will constitute eighteen (18%) percent and women's participation will constitute seven (7%) percent of the total dollar amount of Authority contracts. In entering into this Agreement with the Authority, Veolia is agreeing to submit a final report, within thirty (30) calendar days of the expiration or termination of the Agreement, detailing the actual levels of participation of minority and women's business enterprises in the provision of the Services. The Authority recognizes that the majority of work provided for in this Agreement is to be self-performed by Veolia or subcontracted to highly specialized service providers, and therefore that the disadvantaged business participation goals may not be reasonably practicable to meet. However, failure by Veolia to make a good faith effort to meet the Authority's goals or to submit the required report may be considered a breach of the Agreement resulting in debarment from participating in future Authority contracts.

ARTICLE 15-SUBCONTRACTING AND ASSIGNMENT

None of the Services covered by this Agreement shall be subcontracted or assigned without the prior written approval of the Authority. Such approval or consent will not relieve Veolia of its obligations under this Agreement. The Authority reserves the right, acting reasonably, to object and require the replacement of any subconsultant who is hired or retained without the Authority's prior written consent. The Authority specifically agrees to any subconsultants and to the scope of those subconsultants' services identified in the Technical Proposal.

ARTICLE 16-SITE AND ACCESS

16.1 Offices and equipment. The Authority will provide, at no cost to Veolia, suitable office space for the Interim Executive Director, the Interim Finance Director, the Interim Chief Operating Officer, and other Veolia employees and subcontractors present at the Authority's offices at 1200 Penn Avenue, Pittsburgh, in the performance of the Services, including reasonable and customary office furnishings, such as desks, chairs, conference equipment, copiers and facsimile devices, internet network, and telephones.

16.2 Computers and safety equipment. Veolia will be responsible for supplying computers, cell phones, and related productivity equipment, as well as any personal protective equipment or safety equipment that is customary for the work undertaken for its employees, agents, and subcontractors.

16.3 Site and data access. The Authority will ensure that the Veolia employees and subcontractors performing the Services have, for the duration of this Agreement, such access to the Authority's facilities, information technology systems and data as may be necessary and appropriate to the performance of the Services. Such access will include:

16.3.1 "All-access" clearance at all reasonable times for each Veolia employee, agent or subcontractor engaged in the Services, subject to compliance with the Authority's policies for health and safety;

16.3.2 Access, in a manner reasonably equivalent to the Authority's managers, to networks and data systems that gather, track, and report operational and cost information, including but not limited to access to SCADA systems, asset management systems, enterprise resource management or equivalent cost tracking systems, and existing benchmarking documentation.

16.4 Facilitating communications. The Authority will facilitate Veolia's access to and communication with departments of the City of Pittsburgh and other agencies and authorities where necessary or appropriate to performance of the Services.

ARTICLE 17-FORCE MAJEURE

No delay or failure of performance by either Party shall constitute default hereunder or give rise to any claims for damage if, and to the extent, such delay or failure is caused by fire or other casualty, labor dispute or transportation delay not caused in any way by the affected Party, or by government or military action, inclement weather not reasonably anticipatable, act of God, act or omission of the other Party or its other contractors, failure of any government authority to timely review or to approve the services or to grant permits or approvals, or any other cause beyond the affected Party's reasonable control.

ARTICLE 18-EXCLUSIVITY

To the maximum extent permitted by law, the Authority will not purchase from any person or entity other than an affiliate of Veolia consulting services substantially similar to the Services provided by Veolia during the Term of this Agreement and any Additional Term or Terms. Provided, however, that if the Parties agree, the Authority may retain an executive recruiting firm for assistance in identifying and researching candidates for Executive Director and, if requested by the Authority's Board, Finance Director and/or Chief Operating Officer.

ARTICLE 19- TERMINATION

19.1 For Convenience or Cause. The Authority shall have the right to terminate the Services or any part thereof at any time, whether for convenience or cause, by prior written notice whenever the Authority determines such termination or suspension to be in its own best interest; provided, however, that the Authority may not terminate for its convenience the Services at any time prior to April 1, 2015. In such event, the Authority shall pay Veolia for Services satisfactorily completed and expenses incurred through the date of termination, along with any unavoidable expenses incurred or committed prior to the termination, less the sums Veolia shall have already been paid on account of the Services performed. Should the Authority terminate for convenience, Veolia will be entitled to payment of performance compensation as provided in Section 19.3 below. In the event of a default by Veolia, the Authority may, in addition to termination, pursue any other rights or remedies it may have available under the Agreement or the law.

19.2 Obligations on Termination. In the event of termination under Section 19.1 above, Veolia shall immediately cease performance except as may be authorized by the Authority. Veolia shall promptly assign and transfer to the Authority, as directed by the Authority, all subcontracts, orders, and commitments that the Authority may request be transferred or assigned, and Veolia shall execute and deliver the same and take all such action as the Authority may require to fully vest in the Authority the right of Veolia in and to the same. In the alternative, the Authority may direct that Veolia cancel all subcontracts, orders, and commitments.

19.3 Performance Compensation on Termination for Convenience. In the event that the Authority terminates this Agreement prior to the end of the Term for the Authority's convenience, the Authority will pay Veolia a one-time demobilization payment of \$100,000 at the earlier of the end of the Term or the last day of Veolia's provision of Services hereunder. Veolia shall be entitled to payment pursuant to Sections 4.2.2.3 through 4.2.2.5, and shall further be entitled to payment of any KPI's that are either completed or at least seventy-five percent (75%) complete.

19.4 Exclusive Remedies. The rights and remedies set forth above are the sole and exclusive remedies of Veolia in the event of a termination under Section 19.1, and the Authority shall have no other liability to Veolia on account of or for any damages, including lost profits, arising out of such termination.

19.5 Survival. Notwithstanding the expiration or termination of this Agreement, the rights and obligations that by their sense and context survive the termination or expiration of this Agreement will so survive.

ARTICLE 20 -- NOTICES

Unless otherwise notified in writing, each party shall send notices and other communication to the other party at the address shown below:

To the Authority: Pittsburgh Water and Sewer Authority
Penn Liberty Plaza I
1200 Penn Avenue
Pittsburgh, PA 15222
Attention: Alex W. Thomson, Chairman

with a copy to: Mark F. Nowak, Esq.
Clark Hill PLC
One Oxford Centre, 14th Floor
301 Grant Street
Pittsburgh, PA 15219

To Veolia: Veolia Water North America-Northeast, LLC
Attention: General Counsel
53 State Street, 14th Floor
Boston MA 02109

With a copy to: Veolia Water North America
Attention: PPS Manager
370 Seventh Avenue
New York, New York 10001

ARTICLE 21 -DISPUTES OR CONTROVERSIES

21.1 Amicable resolution. The Authority and Veolia agree to work together to establish a culture of joint governance and to promote a culture of no fault/no blame. The Authority and Veolia will endeavor to resolve all disputes amicably.

21.2 Reference to senior management. In the event that a dispute cannot be amicably resolved by the participants, it shall be referred to Veolia senior management and to the Authority representatives to the Steering Committee for resolution.

21.3 Mediation. If the dispute cannot be resolved by Veolia senior management and the Authority's representatives on the Steering Committee, either Party may request mediation that, unless the Parties agree otherwise, shall be administered by the American Arbitration Association subject to their Commercial Arbitration and Mediation Rules ("AAA Rules") in effect on the date of this Agreement. A request for arbitration shall be made in writing and delivered to the other Party and filed with the person or entity administering the mediation. Mediation shall be a condition precedent to arbitration. Mediation shall take place in Pittsburgh, Pennsylvania.

21.4 Arbitration.

21.4.1 Disputes not resolved through mediation shall be subject to binding arbitration in accordance with the AAA Rules in effect on the date of this Agreement. Arbitration shall take place in Pittsburgh, Pennsylvania.

21.4.2 All disputes shall be initiated by the service of a written notice by one Party to the other of the intent to arbitrate and filing of such notice with the administering organization which, unless the Parties agree otherwise, shall be the American Arbitration Association ("AAA"). Each Party shall bear its own costs and expenses of arbitration and shall pay its pro rata share of any joint fees, costs, and expenses of arbitration including, without limitation, the costs and fees of the arbitrator and of the American Arbitration Association.

21.4.3 The Parties shall jointly designate a single, independent arbitrator or otherwise have an arbitrator selected by the AAA in accordance with the AAA Rules.

21.4.4 The arbitration hearing must be conducted within four (4) months of the date of filing of the intent to arbitrate with the AAA. The hearing shall be conducted in accordance with the Federal Rules of Evidence then in effect. The decision of the arbitrator, including any remedy or relief granted, including specific performance, shall be in writing and shall be rendered no later than fourteen (14) days after the close of the hearing. The decision of the arbitrator shall be final, binding upon the Parties, and non-appealable, and judgment thereon may be entered by any court of competent jurisdiction.

21.4.5 Each Party in arbitration shall be entitled to discovery pursuant to the AAA Rules and the decisions of the arbitrator. However, all discovery shall be completed within sixty (60) days of the date of the appointment of the arbitrator. Further, all discovery must be completed no later than fifteen (15) days prior to the arbitration hearing. The time period for discovery may be extended by the arbitrator for good cause, provided that the arbitrator is able to meet the schedule specified above in Subsection 21.4.4.

ARTICLE 22 - MISCELLANEOUS

22.1 Incorporation of recitals. The recitals appearing at the beginning of this Agreement are incorporated herein by reference.

22.2 Entire agreement. This Agreement contains the entire understanding of the Parties with respect to its subject matter and supersedes all prior negotiations. This Agreement shall not be modified, amended, altered, or supplemented except by agreement in writing duly executed by both of the Parties hereto.

22.3 Counterparts and Digitally-Transmitted Signature. This Agreement shall be executed in two counterparts, each of which shall be deemed an original, and proof of execution may be exchanged by digital means such as facsimile or electronically-mailed .pdf files.

22.4 Applicable law. This Agreement shall be governed by and construed and enforced in accordance with the laws of the Commonwealth of Pennsylvania, without reference to its conflicts-of-laws principles.

22.5 No Private Business Use. This Agreement involves services rendered by a person other than a governmental unit in connection with facilities of the Authority financed, in whole or in part, with proceeds of tax-exempt bonds, and therefore the "private business use" rules under Section 141 of the Internal Revenue Code of 1986, as amended (the "Code"), and the regulations promulgated thereto by the United States Department of the Treasury (the "Regulations"), may apply. The Parties further acknowledge that this Agreement may be a "management contract," as that term is defined in Section 1.141-3 of the Regulations. Therefore, the Parties have used their best efforts to structure this Agreement in accordance with Section 1.141-3 and the guidance of the Internal Revenue Service thereto.

22.6 No third-party beneficiaries. This Agreement shall create no rights in any party other than the Authority and Veolia and no other party is intended to be a third-party beneficiary of this Agreement, except as may be specifically indicated herein.

22.7 Headings. Section headings in this Agreement are for convenience of reference only and shall not constitute a part of this Agreement for any purpose.

22.8 Severability. In the event that any of the provisions of this Agreement are found to be invalid or unenforceable, the validity and enforceability of the remaining provisions shall not be affected.

22.9 Authority. This agreement is entered into by the Authority pursuant to Agenda Item 145 of 2014, adopted at a meeting of its Board held on 11/14, 2014.

APPENDIX B

Sensus Contract

Sensus Contract

PWSA first entered into the Advanced Metering Infrastructure Agreement with Sensus effective February 20, 2014. This agreement had been awarded by the Board of Directors on December 13, 2013. The initial agreement totaled \$7,445,050, broken into categories in Table B-1.

TABLE B-1

INITIAL COSTS FROM ADVANCED METERING INFRASTRUCTURE (AMI) AGREEMENT BETWEEN PWSA AND SENSUS		
CATEGORY	DESCRIPTION	PRICE (\$)
AMI Infrastructure	Data collection units, drive by kits, RF endpoints, programming devices	6,361,100
Software and Project Licenses	System software, billing interface to Cogsdale, customer portal interface, other software	413,750
Additional Costs	Project manager and engineer costs, training costs	663,000
Optional System Leak Detection	Lift and shift permalog	7,200
TOTAL		\$7,445,050

The largest of these categories was the AMI infrastructure cost. A breakdown of these costs can be found in Table B-2.

TABLE B-2

AMI INFRASTRUCTURE COSTS FROM THE INITIAL ADVANCED METERING INFRASTRUCTURE AGREEMENT			
DESCRIPTION	QUANTITY	UNIT PRICE (\$)	EXTENDED PRICE (\$)
Data Collection Unit/Gateway	7	12,000	84,000
Data Collection Unit Installation/Pro	7	20,000	140,000
Drive-by Kit Plus Applicable Software for Interim use	1	Included	0
RF endpoint (single port) wall mount	72,000	58.90	4,240,800
RF endpoint (dual port) Pit Mount	6,000	61.90	371,400
Wall Endpoint Installation	72,000	19.55	1,407,600
Pit Endpoint Installation	6,000	19.55	117,300
Endpoint handheld programming devices required for installation	6	Included	0
TOTAL			\$6,361,100

The agreement was amended on June 10, 2015. In this amendment, the optional system leak detection system from the initial agreement was expanded to include Permalog Integration to Metersense at \$75,000 as well as the additional equipment of 80 Permalog units at \$670 each for \$53,600 and 80 Pit Set 520 SmartPoints at \$62 each for \$4,960, for a total of \$133,560. The Permalog Integration in MeterSense was completed through the Sensus subcontractor Harris Utilities.

This Permalog system was implemented to allow leak data details to be transmitted and reported through Sensus. According to the contract, Harris Utilities was to accomplish this through three steps: bringing sensor details into MeterSense to be included in the datasync between CIS and MDMS; bring the Permalog data into MeterSense from the AMI, including leak, level, and spread; and enabling leak reporting including leak detection sensor maps, leak event report, and a line graph report representing leaks and levels.

APPENDIX C

PWSA and Jordan Tax Service Agreement

PWSA Resolution No. 102 Jordan Tax Service and Goehring Rutter & Boehm Agreement

**PWSA Resolution No. 103 Setting Jordan Tax Service Schedule of Attorney Fees,
Charges, Expenses and Fees**

PWSA Agreement with Jordan Tax Service

AGREEMENT

THIS AGREEMENT made this 12 day of September, 2008, by and between the PITTSBURGH WATER AND SEWER AUTHORITY, a Pennsylvania Municipal Authority, having its principal place of business at Penn Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, PA 15222, hereinafter referred to as the "Municipality"

A

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D

JORDAN TAX SERVICE, INC., a Pennsylvania corporation, having its principal offices at 102 Rahway Road, McMurray, PA 15317, hereinafter referred to as "Jordan" or "Collector".

A

N

D

GOEHRING, RUTTER & BOEHM, P.C., having its principal offices at 437 Grant Street, 14th Floor, Frick Building, Pittsburgh, PA 15219, hereinafter referred to as "Special Legal Counsel" or "SLC."

WITNESSETH

WHEREAS, the Municipality is responsible for the collection of delinquent and liened municipal claims for unpaid water and sewer charges (hereinafter "Delinquent Claims"); and

WHEREAS, Jordan and SLC have the necessary experience, expertise, and resources to assist the Municipality as the Collector and Special Legal Counsel, respectively, for the

WHEREAS, Jordan and SLC are willing to serve as Collector and Special Legal Counsel, respectively, in accordance with the terms and conditions set forth herein;

NOW, THEREFORE, the Municipality, Jordan, and SLC, in consideration of the mutual promises and covenants herein, and intending to be legally bound hereby, agree as follows:

I. DEFINITIONS

A. Unless defined differently herein, the words that follow shall have the following meanings:

1. "Attorney Fees" shall mean those charges for legal services imposed and collected pursuant to a schedule of Attorney Fees adopted by the Municipality in an Ordinance, Resolution, or any amendment thereto, in accordance with Act 1 of 1996 and Act 20 of 2003, 53 P.S. §7106 and any other applicable law, and shall include all Attorney Fees and Out-Of-Pocket Expenses incurred in the collection of Delinquent Claims by the Municipality's Special Legal Counsel. Except as provided herein to the contrary, Attorney Fees are contingent upon collection of Delinquent Claims.

2. "Charges, Expenses, and Fees" shall mean all amounts, including Out-of-Pocket expenses, paid by, charged to, or otherwise incurred by the Municipality in connection with the collection of Delinquent Claims, Charges, Expenses, and Fees shall include, but are not limited to, Servicing Expenses, Out-of-Pocket Expenses and Postage Expenses authorized by the Ordinance, Resolution, or any amendment thereto, in accordance with Act 83 of 2004, 53 P.S. §7101, and any other applicable law. Except as provided herein to the contrary, Charges, Expenses and Fees are contingent upon collection of Delinquent Claims. Water shutoffs are not the responsibility of Collector or SLC and any recoverable costs and expenses relating to notices and/or water shutoffs shall not be considered "Charges, Expenses and Fees" unless such amounts

are provided to Collector with the Municipality's written direction to add such amounts to the "Charges, Expenses and Fees" related to a specific debt.

3. "Collector" shall mean Jordan Tax Services, Inc. and its successors and assigns.

4. "Delinquent Claim" or "Delinquent Claims" shall include the Municipality's delinquent and liened municipal claims as defined in 53 P.S. §7101.

5. "Delinquent Payor" shall mean any person or entity paying Delinquent Claims.

6. "Face" or "Face Amount" shall mean the original municipal claims amount following the expiration of the early payment discount period or, in the case of municipal claims, the original municipal assessment amount plus any applicable penalty pursuant to 53 P.S. §7203.

7. "Gross Collections" shall mean, for the purposes of calculating the Servicing Expense, the total amount of the Face, Penalty, Interest, and Lien Cost for each Delinquent Claim collected.

8. "Interest" shall mean that amount accruing on the unpaid Face Amount at a rate established by Municipality, not to exceed the statutory maximum rate, charged at 1/12th of the statutory maximum annual rate on the first day of each month for the entire month, or any portion thereof. There is no per diem rate of interest.

9. "Lien Costs" are the sum of those Charges, Expenses, and Fees charged by the County Department of Court Records and/or by Collector for the filing, revival, transfer, amendment, and satisfaction of a Delinquent Claim. Lien Costs shall be in those amounts authorized in accordance with the applicable Prothonotary Fee Act, Resolution/Ordinance, the applicable Sheriffs Fee Act or by any other applicable law.

10. "Ordinance" shall mean that Ordinance, or any amendment thereto, adopted by the Municipality pursuant to and in accordance with Sections 1,2 and 3 of the Municipal Claim and Tax Lien Act of May 16, 1923, P.L. 207, as amended. 53 P.S. §7101, §7103, and §7106 (the "Act") respectively, including Act 1 of 1996, Act 20 of 2003 and Act 83 of 2004, adopting a schedule of Charges and Expenses, Fees for Servicing, including a percentage of Gross Collections ("Servicing Expenses"), Postage Expense and Out-of-Pocket Expenses and Attorney Fees and Out-Of-Pocket Expenses to be charged and collected as part of the Municipality's Delinquent Claims by Jordan and SLC. If the Municipality is a municipal authority or school district, then Ordinance, as defined herein, shall mean and be the same as Resolution also defined herein.

11. "Out-Of-Pocket Expenses" shall mean Charges, Expenses and Fees and shall include any amount which is paid or incurred by the Municipality, Jordan or Special Legal Counsel in the collection of Delinquent Claims and which are recoverable Charges, Expenses and Fees pursuant to applicable law.

12. "Penalty" shall mean that amount set by the Municipality not to exceed the statutory maximum rate. In the case of municipal claims, penalty shall become part of the Face Amount pursuant to 72 P.S. §7203. Penalty shall be not charged unless authorized by statute and set by appropriate legislative action of the Municipality.

13. "Postage Expenses" shall mean Charges, Expenses and Fees and shall include those sums paid for mailings and other postal costs incurred in the collection of Delinquent Claims pursuant to the Ordinance or Resolution.

14. "Record Costs" are the sum of those Charges, Expenses, and Fees relating to enforcement proceedings initiated by Municipality through Special Legal Counsel to recover

Delinquent Claims. Record Costs do not include Lien Costs. Record Costs include, but are not limited to, Sheriffs Fees, Department of Court Record's Fees, court costs, recording fees and advertising costs charged in connection with an enforcement proceeding.

15. "Resolution" shall mean Ordinance, as defined herein, if the Municipality is a municipal authority or school district.

16. "Servicing" shall mean all of the specific Collector services provided to the Municipality by Jordan as the Collector of Delinquent Claims as assisted by SLC, pursuant to this Agreement.

17. "Servicing Expenses" shall mean those Charges, Expenses, and Fees, including Commissions, Out-Of-Pocket Expenses and Postage Expenses, set by the Ordinance, Resolution, or any amendments thereto, which are added to Delinquent Claims for the expense of Servicing rendered to the Municipality, by Collector, to collect Delinquent Claims. Servicing Expenses accrue on the first of the month, for the entire month, or portion thereof.

18. "Special Legal Counsel" (or "SLC") shall mean Goehring, Rutter & Boehm, P.C., retained by Municipality to provide assistance to Jordan in Servicing and to represent Municipality in enforced collection of Delinquent Claims and in bankruptcy matters, except as may otherwise be provided herein.

II. SCOPE OF SERVICES

A. General.

1. The Municipality hereby engages the services of Jordan to act as Collector and Goehring, Rutter & Boehm, P.C. to act as Special Legal Counsel and authorizes Jordan and Special Legal Counsel to collect Delinquent Claims in accordance with the terms of this Agreement, the Ordinance or Resolution and in accordance with any other applicable law.

and SLC are authorized to use all of the rights and employ all remedies available to the Municipality on behalf of the Municipality and in the name of the Municipality, to collect Delinquent Claims due the Municipality, including, but not limited to, those rights and remedies available pursuant to the Act, the United States Bankruptcy Code, and all other applicable state, federal, and local laws and regulations. Jordan and SLC shall charge and collect, together with Delinquent Claims, all applicable Charges, Expenses and Fees and Attorney Fees, Penalties, Interest, Lien Costs, Record Costs, Out-of-Pocket Expenses and Postage Expenses, and any other amount due and payable in accordance with the Ordinance, Resolution and any other applicable laws.

2. During the term of this Agreement, Jordan shall be the Municipality's exclusive Collector and provide Servicing, and SLC shall be the Municipality's exclusive Special Legal Counsel providing legal services to the Municipality for the collection of all unpaid Delinquent Claims in accordance with the Agreement, the Ordinance, Resolution and all other applicable laws. If a conflict of interest should arise in which SLC cannot represent the Municipality in a specific matter or matters, substitute legal counsel may be retained for such specific matter or matters. From time-to-time, as the need arises, SLC may direct one or more collection matters to the Municipality's Solicitor for processing. In these instances, the Solicitor shall be considered substitute legal counsel. Compensation of any substitute legal counsel shall be in accordance with this Agreement unless otherwise agreed to by the Municipality and substitute legal counsel.

3. The Municipality shall continue to collect all current municipal claims.

B. Specific Collector Services (“Servicing”).

1. Delinquent Claim Collection

a. Assemble Delinquent Claim information provided by the Municipality and create, update and maintain an electronic record of all of the Municipality’s Delinquent Claims.

b. Prepare and issue statements and certifications to property owners, Delinquent Payors and interested persons. Conduct mass mailings periodically.

c. Conduct necessary record reviews at appropriate County offices.

d. Record and deposit on a timely basis all monies collected and disburse funds to the Municipality.

e. Prepare, enter, revive and satisfy Delinquent Claims as municipal claims in the appropriate dockets.

f. Installment Payment Plans. “Installment Payment Plans” shall be permitted for all delinquent taxpayers, unless otherwise provided herein. Installment Payment Plans requested by Delinquent Payors, other than the delinquent taxpayer, shall be subject to the review and approval of the Collector or Special Legal Counsel. If an Installment Payment Plan is denied for any of the reasons contained herein, or for any other reason, a collection action may be filed as provided herein.

1. Installment Payment Plans shall be denied to any delinquent taxpayer or Delinquent Payor who refuses to address all of the Municipality’s Delinquent Claims in one Installment Payment Plan. Other reasons for denial of an Installment Payment Plan shall include, but are not limited to: refusal to pay the Delinquent Claims within the Term Guidelines set forth herein by the Municipality; an uncured prior Installment Payment Plan default; Delinquent Taxpayers with multiple Delinquent Properties; Delinquent Taxpayers

Owners of delinquent vacant land, unoccupied structures or income producing delinquent properties.

2. Installment Payment Plan Guidelines. The following Installment Payment Plan term guidelines are hereby established by the Municipality for all Installment Payment Plans. Any delinquent taxpayer or Delinquent Payor refusing to comply with any of the term guidelines shall be required to pay all of the Municipality's Delinquent Claims in full unless the Delinquent Taxpayer is granted a Hardship Payment Plan or, for good cause shown, an exception is made by the Municipality, STS or SLC. Note, the Municipality's written Installment Payment Plan forms shall contain several additional provisions as required by Collector and/or Special Legal Counsel.

a. Term Guidelines:

1. Owner Occupied Residential Properties. The term of any negotiated Combined Installment Payment Plan shall be 24 months or less.

2. Tenant Occupied Residential, Occupied Commercial, Occupied and Operating Industrial Properties. The term of any negotiated Combined Installment Payment Plan shall be 18months or less.

3. Vacant land, unoccupied residential, commercial and industrial properties and any other property type not specifically referenced in subparagraphs 1 and 2, above. The term of any negotiated Combined Installment Payment Plan shall be 12 months or less.

3. Judgment, Amicable Scire Facias or Consent Judgment: The entry of judgment, whether by consent or by default, shall be a condition of any Combined Installment Payment Plan requested following the filing of any collection action. An Amicable Scire Facias or Consent Judgment may be required. at the sole and absolute discretion of SI.C.

where an Installment Payment Plan is requested prior to the filing of a Collection Action for any delinquent property or delinquent taxpayer with combined Delinquent Claims totaling \$1,500 or more. A Delinquent Payor, other than a delinquent taxpayer, may be denied an Installment Payment Plan where payment of Delinquent Claims is not secured by a judgment against the Delinquent Property unless suitable substitute security, at the sole discretion of Special Legal Counsel, is provided by the Delinquent Payor.

4. The parameters of Hardship Payment Plans shall be as determined by the Municipality.

g. Forward pre-foreclosure notices to property owners in accordance with Act 1 of 1996 and Act 20 of 2003 or any other applicable law as a prerequisite to the initiation of enforcement proceedings where Attorney Fees will be charged and recovered by SLC.

h. Monitor all Sheriffs Sale proceedings advertised in the Pittsburgh Legal Journal, conduct short title and tax searches, if necessary, and file and update claims for Delinquent Claims as well as the Municipality's current claims with the Sheriffs Office. Collector shall file the Municipality's current municipal claims at no expense to the Municipality, even if there are no Delinquent Claims due the Municipality for the property subject to Sheriffs Sale.

i. Monitor Bankruptcy proceedings of which Jordan has received notice and submit proofs of claim for Delinquent Claims as well as the Municipality's current claims on behalf of the Municipality.

j. Advance all postage relating to the collection of Delinquent Claims and collect such Postage Expenses from the Delinquent Payor.

k. Assist SLC in providing legal services to the Municipality in accordance with the provisions of this Agreement and other applicable laws. Jordan maintains an in house

legal department consisting of paralegals and clerks who assist SLC, at the direction of SLC, in the enforced collection of Delinquent Claims including, but not limited to: (1) investigations; (2) research; (3) preparation and filing of pleadings, motions and petitions; (4) maintaining files; (5) preparing correspondence; (6) telephone conversations with interested persons; (7) negotiating amicable scire facias (“consent judgments”) and installment payment agreements; and (8) concluding legal proceedings.

1. Maintain a separate bank account for the deposit of the Municipality’s Delinquent Claims. Jordan shall be permitted to transfer funds from such account to the Municipality, to SLC, to Jordan and to any third-parties retained to assist in the collection process and entitled to reimbursement of Charges, Expenses and Fees recovered by Jordan from the Delinquent Payor. Such third-parties may include, but are not necessarily limited to, title searchers, process servers, investigators, appraisers and any party entitled to reimbursement or refund of any amount collected.

m. Submit on a monthly basis, or more frequently as funds are available, a detailed report together with a check or wire transfer relating to collections from the preceding month or payment period.

n. Include Municipality’s current balance due in any bankruptcy claim or Sheriff’s Sale claim filed by Jordan or SLC on behalf of the Municipality.

o. Provide all collection notices and respond to customer inquiries via trained customer service representatives.

p. Provide adequate staff and equipment necessary to provide Servicing in accordance with the terms of this Agreement.

q. Provide any other service not specifically set forth herein which is deemed necessary by Jordan to collect the Municipality's Delinquent Claims in accordance with this Agreement and any applicable laws.

r. During the initial term or any subsequent terms of this Agreement, Jordan shall maintain an office in Room 213B, Allegheny County Courthouse, Pittsburgh, PA 15219 or other downtown Pittsburgh location chosen at Collector's sole discretion.

2. Special Legal Counsel Services

a. During the term of this Agreement, Jordan and SLC shall collect the Delinquent Claims on behalf of the Municipality and shall exercise all collection and enforcement rights, duties and remedies on behalf of, in the name of, and available to the Municipality, pursuant to the Act, 53 P.S. § 7101 et seq. and all other applicable laws, including the right to seek a decree for Sheriffs Sale.

b. Pursuant to 53 P.S. §7106, Jordan shall, where applicable, provide Act 1 and/or Act 20 notices to property owners or other Delinquent Payor. If the notification required by 53 P.S. §7106 does not result in payment in foil or an installment payment arrangement with the property owner or other Delinquent Payor, a praecipe for a writ of *scire facias* may be filed against the delinquent property and, unless paid, a judgment will be sought in favor of the Municipality for the unpaid Delinquent Claims. Such action will be pursued until the Delinquent Claims are collected in full by voluntary payment or until the delinquent property is listed and sold at Sheriffs Sale pursuant to the Act, 53 P.S. § 7101 et seq., the Pennsylvania Rules of Civil Procedures and all other applicable laws.

c. SLC shall be permitted, at its sole discretion, to bring legal proceedings, including but not limited to, In-Rem Scire Facias proceedings under the Act, assumpsit actions, rent attachments, garnishments, the sale of chattel and the filing and pursuit of claims in

Bankruptcy Court, to enforce collection of Delinquent Claims. SLC shall be permitted to bring any such action on behalf of and in the name of the Municipality. The SLC shall have authority to discontinue any proceeding if it determines that collection of Delinquent Claims is unlikely or that future collection efforts are not justified. If SLC has determined not to bring a legal proceeding against a specific property or against a specific delinquent account, SLC shall still file a legal action at the request of the Municipality against such property or account provided that the Municipality shall reimburse SLC for Attorney Fees and Out-of-Pocket Expenses either by advance or within 30 days of invoice. Any Attorney Fees and Out-of-Pocket Expenses thereafter recovered in such action shall be reimbursed to the Municipality.

d. In Municipality initiated Sheriffs Sales, if the “upset price” as defined in 53 P.S. §7279 of the Act, is not bid at the time of the Sheriffs Sale, SLC shall postpone the Sale and shall automatically seek a Petition to Sell the property “free and clear” of liens, claims, mortgages, charges and estates (“Free and Clear Sale”) pursuant to 53 P.S. §7281 of the Act. Unless a different minimum bid price is set by Collector and/or SLC, at any Free and Clear Sale of a delinquent property, the minimum bid price shall be set at the Collector’s and SLC’s Charges, Expenses, Fees and Attorney Fees, Out-of-Pocket Expenses and the Record Costs of the proceeding. If no bids are received at a subsequent Sheriffs Sale, then the property shall thereafter be subject to further sale, at the sole and absolute discretion of SLC, for an amount less than the Collector’s and SLC’s Charges, Expenses and Fees and Attorney Fees, Out-of-Pocket Expenses and the Record Costs of such proceeding. Any eventual recovery shall be dispersed in accordance with this Agreement. At the time of any Sheriffs Sale following the grant of a Free and Clear Petition by the Court, the Municipality may bid, but any Municipality bid shall be no less than the Collector’s and SLC’s Charges, Expenses and Fees, Attorney Fees and Out-of- Pocket Expenses of such proceeding.

e. SLC and/or Jordan shall negotiate and enter into installment payment agreements and/or forbearance agreements for the payment of Delinquent Claims in one or more future payments. If the installment or forbearance agreement is entered into prior to the initiation of legal action, SLC and Jordan shall be permitted to require an amicable scire facias or consent judgment to secure the repayment of the Delinquent Claims. If the installment or forbearance agreement is sought following the initiation of a scire facias or assumpsit action, then that legal action shall be reduced to judgment to secure repayment of the Delinquent Claims due.

f. SLC shall assist Jordan in the preparation of Delinquent Claims for filing as municipal claims and shall review and execute all municipal claims for filing in the appropriate docket.

g. The filing of appropriate legal proceedings shall be at SLC's sole and absolute discretion. The Municipality may set guidelines as to a minimum amount due before legal action may be filed.

III. CONSIDERATION

In consideration of the services to be performed by Jordan as Collector and by SLC, the Municipality agrees to pay to Jordan and SLC as follows:

A, Compensation of Collector and SLC: Other Payments: Charges: All compensation charged shall not exceed the amounts as set forth in the Ordinance or Resolution. Servicing Expenses due Collector and Attorney Fees due SLC shall be added to the Delinquent Claims and shall be recovered directly from the Delinquent Payor. All Servicing Expenses and Attorney fees are contingent upon collection from the delinquent property, Delinquent Taxpayer or other Delinquent Pavor. As a result and except as provided in this Agreement to the contrary. if

Municipality shall not be obligated to pay such Servicing Expenses to Collector or Attorney Fees to Special Legal Counsel.

1. Contingent Fees

a. Collector

1. The Municipality agrees that Collector shall be paid a commission based upon a percentage of Gross Collections as a Servicing Expense in accordance with the Ordinance or Resolution for the collection of Delinquent Claims during the term of this Agreement.

2. Certification: A no lien letter fee for Delinquent Claims provided to any third-party requesting such information shall be \$25.00 per no lien letter. This fee shall be the responsibility of the third-party requesting such information.

b. Special Legal Counsel

1. The Municipality agrees that SLC shall be paid Attorney Fees for enforced collection of Delinquent Claims in accordance with the Attorney Fee and Out-of-Pocket Expense provisions of the Ordinance or Resolution.

2. Non-Contingent Fees

a. Special Legal Counsel and Jordan:

1. The Municipality shall be responsible for reimbursing SLC for any Attorney Fees and Out-of-Pocket Expenses due and owing to SLC should the Municipality direct SLC to begin or continue any action which does not result in payment of the Attorney Fees from a Delinquent Payor or from the sale of the delinquent property, direct SLC to delay or cease any collection proceeding, discontinue any action or withdraw from any proceeding. If the Municipality collects any Delinquent Claim and does not include and immediately thereafter

SLC's Attorney Fees and Out-of-Pocket Expenses, and Jordan's Servicing Expenses, including Out-of-Pocket Expenses and Postage Expenses, including any financing, pledge, transfer, sale or assignment of Delinquent Claims pursuant to 53 P.S. § 7147 or other applicable law, Jordan and SLC shall be paid all amounts due and owing. If any of the above occurs, SLC and Jordan shall be entitled to payment-in-full of SLC's Attorney Fees and Out-of-Pocket Expenses, and Jordan shall be entitled to payment-in-full of Servicing Expenses, Out-of-Pocket Expenses and Postage Expenses by Municipality within thirty (30) days of written demand.

2. Should the Municipality terminate this agreement, the Municipality shall reimburse SLC for any Attorney Fees and Out-of-Pocket Expenses due and owing to SLC and Servicing Expenses, Out-of-Pocket Expenses and Postage Expenses due and owing to Jordan on all Delinquent Claims within thirty (30) days of written demand from SLC and/or Jordan.

3. The Municipality may consult with SLC concerning the selection of delinquent properties to be pursued by legal action for collections. SLC shall have the final decision concerning whether or not to pursue collection against a specific property and SLC shall have authority to discontinue proceedings if it determines that collection of Delinquent Claims is unlikely or that further collection efforts are not justified. SLC shall pursue delinquent properties at the request of Municipality even if SLC would not independently agree to file an enforcement action against such properties provided that the Municipality reimburses SLC for Attorney Fees and Out-of-Pocket Expenses and Jordan for Servicing Expenses and Out-of-Pocket Expenses not recovered in such proceeding. If the amounts due Jordan and SLC are not redeemed by payment during the course of such proceeding or from a third-party bid received at Sheriff's Sale, then the Municipality shall either bid an amount sufficient to pay all amounts due Jordan and SLC and take title to the property at Sheriff's Sale or direct SLC to stop the

Expenses, Attorney Fees and Out-of-Pocket Expenses paid by the Municipality to Jordan and SLC and thereafter recovered from a Delinquent Payor shall be reimbursed to the Municipality.

3. Detailed Records

SLC and Collector shall maintain detailed records of all Attorney Fees, Servicing Expenses and Out-of-Pocket Expenses collected pursuant to this Agreement and shall keep a separate account of such amounts for each delinquent account where any Attorney Fees, Servicing Expenses or Out-of-Pocket Expenses are recovered. SLC shall comply with this provision if such records are maintained by Collector or SLC. All Attorney Fees and Out-of-Pocket Expenses shall be added to the Delinquent Claims for each property subject to a proceeding initiated by SLC. Attorney Fees shall thereafter be collected by SLC or by Collector on behalf of SLC as payment of legal services rendered to the Municipality by SLC. Servicing Expenses and Out-of-Pocket Expenses due Collector shall be charged and collected by the Collector and shall serve as compensation for services rendered to the Municipality by Collector, except that liability for payment of such amounts shall not be contingent upon the initiation of a legal proceeding.

4. Miscellaneous Provisions

a. Jordan shall be the exclusive Collector and SLC shall be the exclusive SLC of Delinquent Claims during the term of this Agreement. The Municipality shall not accept any payment of any Delinquent Claims or enter into an installment payment agreement with any Delinquent Payor for any Delinquent Claims. Any Delinquent Claim payment received by the Municipality, including proceeds from the sale, transfer and assignment of Delinquent Claim liens or receivables, or from a financing transaction shall be forwarded to Jordan for application in accordance with the terms of this Agreement. If the Municipality fails to protect the Servicing Expenses, Postage Expenses, Out-of-Pocket Expenses due Jordan and/or Attorney Fees and

of-Pocket Expenses due SLC as provided herein, Jordan shall be entitled to payment-in-full of the Servicing Expenses, Postage Expenses, and Out-of-Pocket Expenses due Jordan and Special Legal Counsel shall be entitled to payment-in-full of any Attorney Fees and Out-of-Pocket Expenses due SLC, which, if not deducted and paid by Jordan in accordance with Article IV, shall be paid by the Municipality within thirty (30) of Jordan's and/or SLC's written demand for payment.

b. To the extent that any portion of the Servicing Expenses, Postage Expenses, Out-Of-Pocket Expenses or Attorney Fees charged and collected in accordance with this Agreement are deemed by any court to be unlawful, the Municipality shall be solely responsible for reimbursement or refund of any amount due to any Delinquent Payor entitled to such refund. All Servicing Expenses, Postage Expenses, Out-Of-Pocket Expenses, and Attorney Fees collected by Jordan and SLC, shall be retained by Jordan and SLC as compensation for services rendered and reimbursement of Out-of-Pocket Expenses and Postage Expenses pursuant to the terms of this Agreement.

c. Jordan shall add all Record Costs, Lien Costs, Servicing Expenses, Postage Expenses, Out-Of-Pocket Expenses and Attorney Fees due to each Delinquent Claim due and shall collect such amounts, together with the Face, Penalty and Interest due and owing for each Delinquent Claim, from the Delinquent Payor. Jordan shall provide a monthly collection report to the Municipality detailing collections made in the preceding month.

d. The Municipality agrees that any and all Record Costs, Lien Costs, Postage Expenses and Out-Of-Pocket Expenses advanced by Jordan or SLC are costs which are the responsibility of the Municipality. The Municipality shall advance all Lien Costs. All Record Costs, through judgment, shall be advanced by Jordan and/or SLC subject to reimbursement as provided herein.

e. The Municipality shall create an execution cost and expense fund (“Fund”) for the Record Costs and Out-of-Pocket Expenses, including but not limited to, fees for title searches and the filing fee for any Sheriff Sales, for the execution or Sheriff’s Sale part of any filed enforcement action initiated by SLC. The Fund shall be sufficient for at least twenty- five (25) executions per month. However, at the Municipality’s discretion, the fund shall be larger, permitting Collector and SLC to file in excess of twenty-five (25) executions per month. Recovered amounts paid from the Fund shall be forwarded to the Municipality and shall be redeposited into the Fund for use in subsequent cases.

f. In the event that any Record Costs, Lien Costs, Postage Expenses and Out- Of-Pocket Expenses are advanced but not recovered by Jordan or SLC in the Servicing and/or in the enforced collection of Delinquent Claims, the Municipality agrees and shall make payment to Jordan and/or SLC for any and all Record Costs, Lien Costs, Postage Expenses and Out-Of- Pocket Expenses paid or incurred within thirty (30) days of Jordan’s written demand for payment.

g. SLC shall not be responsible for advancing any Record Costs or Out-of-Pocket Expenses. If such costs are ever advanced by SLC, SLC shall be reimbursed by Municipality within thirty (30) days of SLC’s written demand for payment.

IV. DISTRIBUTION OF DELINQUENT CLAIM COLLECTIONS

Jordan shall add all Record Costs, Lien Costs, Servicing Expenses, Postage Expenses, Out-Of-Pocket Expenses and Attorney Fees due to each Delinquent Claim due and shall collect such amounts, together with the Face, Penalty and Interest due and owing for each Delinquent Claim. from the Delinquent Pavor.

A. Full Payment.

Upon receipt of full payment, Jordan shall, as funds are available, remit (i) all Attorney Fees and Out-Of-Pocket Expenses to Special Legal Counsel, (ii) the Servicing Expense, Postage Expense and Out-Of-Pocket Expense due Jordan (iii) Record Costs, Lien Costs and Expenses, and (iv) the Face, Penalty and Interest portion of the Delinquent Claims to the Municipality.

B. Less than Full Payment or Installment Payments.

Where a less than full payment of Delinquent Claims has been received, or when Delinquent Claims are being paid in installments, Jordan shall distribute the amounts collected to the SLC, Jordan, third-parties and to the Municipality in the following order of priority:

1. Reimbursement of SLC's Out-Of-Pocket Expenses and Attorney Fees.
2. Reimbursement of Jordan's Out-Of-Pocket Expenses, Servicing Expenses and Postage Expenses.
3. Reimbursement of Record Costs and third party expenses.
4. Delinquent Claim collections shall next be applied in the following order¹:
 - a. Delinquent taxes, the earliest in lien having priority, until each tax year is paid-in-full;
 - b. Municipal claims, the earliest in lien having priority, until each municipal claim is paid-in-full²;

¹ Pursuant to applicable law, a Delinquent Payor is permitted to direct a payment towards a specific debt. The Delinquent Payor is not permitted, however, to direct how the payment is to be applied towards the specific debt. Thus, the application of payment set forth in this subparagraph 4 applies where no specific payment direction has been provided by the Delinquent Payor. In addition, if there are multiple delinquent accounts with common ownership, absent application of payment direction by the Delinquent Payor, the payment shall be applied to a specific account at the sole and absolute discretion of SLC and/or Jordan.

5. Partial payment of a Delinquent Claim not sufficient to pay a Delinquent Claim in full shall be applied in the following order:

- (a) Penalty;
- (b) Interest;
- (c) Lien Costs;
- (d) Face;

6. Interest and Servicing Expenses shall continue to accrue on the Delinquent Claim until the full amount necessary to satisfy a year's Delinquent Claim is paid in full. Interest and Servicing Expenses accumulate on the first of the month for the entire month, or part thereof, in which payment is received. There is no per diem rate of interest or per diem Servicing Expense. Pursuant to 53 P.S. §7203, the Penalty portion of any municipal assessment shall be included in the amount for which the municipal claim is filed.

C. Delinquent Claim Reductions* Additions and Set-Offs.

1. From time-to-time a proceeding results in the payment of an amount less than the full amount of the Delinquent Claims due and owing. This includes, but is not limited to, Bankruptcy sales free and clear of liens, sales pursuant to Section 31 and Section 31.1 of the Act, compromises, distributions in eminent domain proceedings and quiet title actions. In the event of such sale, compromise, or reduction, the Delinquent Claims shall be distributed in accordance with Article IV. B. of this Agreement.

2. If a Delinquent Claim previously paid to Jordan is reduced through a tax assessment reduction or by any other decree occurring after the date of payment of such Delinquent Claim by Jordan to the Municipality, the Municipality shall be responsible for paying any refund due

²The distribution of partial payment made in connection with voluntary installment payment of Delinquent Claims may be altered by the provisions of an intergovernmental cooperation

directly to the Delinquent Payor. Jordan shall be responsible for refunding directly to the Delinquent Payor that portion of the Servicing Expense relating to the amount of the Gross Collections reduced by the reduction.

3. Collector and SLC are authorized to use the Municipality's right to set off any claim to a refund against any municipal obligation owed in accordance with the Act, 53 P.S. § 7231-7235.

V. MUNICIPALITY'S ADDITIONAL RESPONSIBILITIES

A. Notices.

1. If any Municipality is required by law to provide notice to any tenants of occupied property or other persons liable for Delinquent Claims with notice of any action with respect to providing services to the property or with respect to any other matter, the Municipality shall be responsible for providing such notice(s) at its expense and shall provide copies or a record of all such notice(s) to the Collector or SLC. Water shutoffs are not the responsibility of Collector or SLC and any recoverable costs and expenses relating to notices and/or water shutoffs shall not be considered "Charges, Expenses and Fees" unless such amounts are provided to Collector with the Municipality's written direction to add such amounts to the "Charges, Expenses and Fees" related to a specific debt.

B. Records.

1. The Municipality shall provide Jordan with all Delinquent Claim information, which includes detailed statements or records of Delinquent Claims due and owing for each property and/or owing Delinquent Claims to the Municipality, in a form acceptable to Jordan at the sole expense of the Municipality and provide Jordan with access to all relevant documents, records, agreement by and between the Municipality and one or more additional

facilities, and personnel necessary for Jordan and/or SLC to effectively provide services under this Agreement. Neither Jordan nor SLC shall be responsible for the accuracy or correctness of any of the Municipality's records relating to any Delinquent Claim due prior to the date of this Agreement. Jordan shall endeavor to assemble a unified Delinquent Claim record of the Municipality's Delinquent Claims to the best of Jordan's ability. However, Jordan shall not be responsible for the accuracy of any Delinquent Claim where the data provided to Jordan by the Municipality is inaccurate or is insufficient to prepare a complete record for that Delinquent Claim.

C. Miscellaneous.

1. The Municipality shall execute any and all necessary powers of attorney or other documents or shall otherwise deputize or grant whatever authority is necessary, if any, in addition to the authority provided in this Agreement, for Jordan and SLC to provide the services required herein.

2. The Municipality shall provide to Jordan and/or SLC all notices which Municipality receives relating to any event or proceeding that may affect any Delinquent Claim, delinquent person or delinquent property. Absent independent receipt of such notices by Jordan or SLC, Jordan and SLC shall not be responsible for any Delinquent Claim affected by such event or proceeding.

3. The Municipality shall provide Jordan and SLC with a list of any pending legal proceedings, filed on behalf of or against the Municipality, including any pending bankruptcy cases involving any Delinquent Claims. Jordan, SLC and the Municipality shall then determine whether such pending legal proceedings will be concluded by SLC and Jordan or by Municipality, through those persons or entities handling such matters on or before the date of this Agreement. If it is determined that SLC shall represent the Municipality in any such matter.

substitution of appearance shall be prepared by the Municipality's prior legal counsel in such matter or matters. If such matter or matters shall continue to be handled by someone other than Jordan and SLC, any statement of the balance due for Delinquent Claims shall be obtained from Jordan and payments made, unless otherwise agreed to, shall be made to Jordan and applied in accordance with the provisions of this Agreement.

4. Beginning on the date of this Agreement, the Municipality shall not institute any independent collection action or proceeding, whether administrative or judicial with respect to any Delinquent Claim unless it is determined by the Municipality, Jordan and SLC that the Delinquent Claims are not likely to be collected and that the Municipality will utilize an administrative or* judicial procedure to attempt to transfer title to the property subject to the Delinquent Claims. No such action shall be filed without SLC's consent if the property in question is subject to a pending action filed on behalf of Municipality by SLC unless all Attorney Fees and Out-of-Pocket Expenses are paid by the Municipality. In a proceeding initiated by the Municipality pursuant to this Paragraph, Jordan shall continue to act as Collector and all payments received shall be forwarded to Jordan and shall thereafter be applied pursuant to this Agreement.

5. The Municipality shall appoint a representative or representatives who shall be the primary contact person(s) for all communications with Collector and Special Legal Counsel for matters related to this Agreement or any related agreements.

VI. CONDITIONS PRECEDENT

1. Jordan shall have received a complete list of the Municipality's unpaid Delinquent Claims and had ample opportunity to create an appropriate database to be used in the collection

of such Delinquent Claims before Jordan and SLC shall be obligated to perform pursuant to the terms of this Agreement.

2. The Municipality shall have complied with all of the representations and warranties set forth in Article VII, below:

VII. REPRESENTATIONS AND WARRANTIES

A. Representations and Warranties of the Municipality.

1. The Municipality hereby represents and warrants as of the date of this Agreement that:

a. The Municipality is a Pennsylvania Municipal Authority and is duly organized and validly existing under the laws governing its creation. The Municipality has taken all necessary action to authorize the execution, delivery, and performance of this Agreement;

b. The Municipality has adopted all appropriate ordinances, resolutions, obtained any consent, approval, authorization, or order of any court or governmental agency or body required for the execution, delivery, and performance by the Municipality of this Agreement;

c. The Municipality has adopted an Ordinance or Resolution pursuant to Sections 1,2, and 3 of the Act, as amended, 53 P.S. §§7101, 7103, and 7106, respectively, as amended by Act 1 of 1996, Act 20 of 2003 and Act 83 of 2004, allowing the Charges, Expenses, and Fees of Servicing (“Servicing Expenses”) including a percentage of Gross Collections and postage reimbursement (“Postage Expenses”) and SLC’s Attorney Fees and Out-of-Pocket Expenses to be collected as part of Delinquent Claims collected on behalf of the Municipality by the Collector. This Agreement authorizes Jordan and SLC to act in reliance upon said Ordinance or Resolution and any other relevant ordinances or resolutions for the purpose of collecting amounts due for Delinquent Claims.

e. The Delinquent Claims subject to this Agreement have not been waived, modified, altered, satisfied, redeemed, or subordinated in any respect, or rescinded, and the property subject to such Delinquent Claims have not been released from the lien evidenced by the Delinquent Claim, in whole or in part.

f. The Face Amount of each Delinquent Claim, whether or not filed as a lien or municipal claim, is true and correct to the best of the Municipality's information, knowledge, and belief.

g. All Delinquent Claims filed prior to the date of this Agreement have been filed in accordance with applicable law and are valid and collectible if any balance due remains uncollected.

B. Representations and Warranties of Jordan and SLC.

1. Jordan hereby represents and warrants as of the date of this Agreement that:

a. Jordan is a corporation duly and validly existing, in good standing, under the laws of the Commonwealth of Pennsylvania. Jordan has taken all necessary action to authorize the execution, delivery, and performance of this Agreement; and

b. This Agreement and all of the obligations of Jordan hereunder are the legal, valid, and binding obligations of Jordan, enforceable in accordance with the terms of this Agreement, except as such enforcement may be limited by bankruptcy, insolvency, reorganization, receivership, moratorium, or other laws relating to or affecting the rights of creditors generally.

2. SLC hereby represents and warrants as of the date of this Agreement that:

a. SLC is a professional corporation duly and validly existing in good standing, under the laws of the Commonwealth of Pennsylvania. SLC has taken all necessary action to authorize the execution, delivery, and performance of this Agreement; and

b. This Agreement and all of the obligations of SLC hereunder are the legal, valid, and binding obligations of SLC, enforceable in accordance with the terms of this Agreement, except as such enforcement may be limited by bankruptcy, insolvency, reorganization, receivership, moratorium, or other laws relating to or affecting the rights of creditors generally.

VIII. CONTRACT TERM

A. Term.

The term of this Agreement shall commence as of October 1, 2008 and unless sooner terminated pursuant to Article VIII, Part C hereof, shall expire on September 30, 2010. If not terminated and absent the Parties' agreement to one or more additional longer Terms, this Agreement shall automatically renew for an additional Term or Terms of one hundred eighty (180) days subject to the right to terminate as provided below.

B. Default.

If (i) a party to this Agreement fails to materially comply with any of the representations and warranties made herein; or (ii) a party to this Agreement fails to materially comply with any other material provision of this Agreement within thirty (30) days after written notice from the non-defaulting party of such material noncompliance or within such reasonable but necessary longer time needed to comply, provided that the alleged defaulting party is diligently making all reasonable efforts to comply, such party shall be in default. Upon the occurrence of a default hereunder, the defaulting party shall within thirty (30) days of receipt of such written notice of default have thirty (30) days to correct the breach or material non compliance or such longer time as reasonable necessary to comply. If the defaulting party does not cure the default within the cure period, then the non-defaulting party may pursue any remedy at law or in equity to

may be entitled including bringing action to specifically enforce provisions of this Agreement and/or collect any sums due hereunder.

Failure by the Municipality, Jordan or SLC to take timely action with respect to any potential default or violation by the Municipality, Jordan or SLC of any of the terms, conditions covenants or representations and warranties of this Agreement shall not in any manner limit, prejudice, diminish, or constitute a waiver of any right of the Municipality, Jordan or SLC to act with respect to any subsequent violation or default including any violation or default which is similar in nature to any prior violation or default that was not the subject of any action.

C. Termination*

1. Termination by Parties for Material Breach. During any time of this Agreement, this Agreement may be terminated by the parties only for an uncured material breach of its terms after written notice and opportunity to cure. A material breach shall include any uncured default as provided in Part B above. If the material breach or incident is cured, this Agreement shall remain in effect through the initial term or any subsequent term hereof. Termination for material breach of one Party shall not be termination as to the other parties.

2. Termination for Non-Renewal. This Agreement shall terminate upon written notice from the Municipality, received by Jordan and/or SLC ninety (90) days or more prior to the expiration of any Term. Termination as to Collector or SLC shall not terminate the other.

3. Upon termination for default or non-renewal of this Agreement, Jordan shall provide the Municipality with statements of Servicing Expenses, Postage Expenses, and Out-of-Pocket Expenses due Jordan, and SLC and/or Jordan shall provide the Municipality with statements of Attorney Fees due SLC which shall be paid to Jordan and SLC within thirty (30)

4. This Agreement shall terminate as to Jordan or SLC upon ninety (90) days prior written notice to Municipality. Termination by one party shall not be termination by both.

D. No Co-Partnership or Agency.

It is understood and agreed that nothing herein contained is intended or shall be construed in any respect to create a relationship of co-partners between Municipality, Jordan and SLC. Jordan and SLC shall be considered to be independent contractors at all times under this Agreement providing services to the Municipality as authorized herein and by applicable law.

E. Notices.

1. All notices, reports, and documents required under this Agreement shall be given as follows:

a. As to the Municipality:

Pittsburgh Water and Sewer
Authority Penn Liberty Plaza I 1200
Penn Avenue Pittsburgh, PA 15222
or such other place or person as the Municipality may designate in writing.

b. As to Jordan:

William R. Linnert, Jr.,
President Jordan Tax Service,
Inc.
102 Rahway Road
McMurray, PA
15317
or such other place as Jordan may designate in writing.

c. As to Special Legal Counsel:

Michael G. McCabe, Esquire
Goehring, Rutter & Boehm,
P.C.
1424 Frick Building
437 Grant Street
Pittsburgh, PA

F. Legal Challenges.

1. Jordan and SLC: Except as otherwise provided specifically herein, Jordan and SLC agree that they shall be responsible for the payment of their own attorney fees and costs of defense in the event of any lawsuit filed alleging any improper act, error, or omission of Jordan or SLC or by any agent, employee, licensee, contractor, or subcontractor of Jordan or SLC with respect to the Servicing of the Delinquent Claims.

2. Municipality: The Municipality agrees that it shall be responsible for the payment of its own attorney fees and costs of defense in the event of any lawsuit filed by reason of any act, error, or omission of the Municipality or of any agent, employee, licensee, contractor, or subcontractor of the Municipality. In addition, the Municipality shall be responsible for providing legal counsel at its sole cost and expense in any litigation brought against Jordan or SLC challenging the legal authority of the Municipality, Jordan or SLC to collect the Delinquent Claims, Lien Costs, Record Costs, Servicing Expenses, Attorney fees and Out-of-Pocket Expenses pursuant to the terms of this Agreement.

G. Modification or Amendment.

This Agreement constitutes the entire agreement of the parties on the subject matter hereof and may not be changed, modified, discharged, or extended except by written amendment or change order duly executed by the parties. The Municipality shall not enter into any Intergovernmental Cooperation Agreement (“ICA”), which modifies any of the provisions of this Agreement, without the prior written consent of Jordan and SLC. In the event of an ICA, all terms and conditions of this Agreement shall remain unaffected except for those provisions modified by the ICA. The ICA provision shall govern unless and until the ICA terminates or the ICA provisions are deemed unlawful.

H. Applicable Law.

This Agreement shall be deemed to have been made in, and shall be construed in accordance with the laws of the Commonwealth of Pennsylvania.

I. Survival.

It is understood and agreed that the duties of Jordan, SLC and the Municipality hereunder and the representations and warranties set forth herein shall survive the collection of any Delinquent Claim by Jordan or SLC.

J. Authorization.

This Agreement is entered by the Municipality and was approved by the Municipality via Resolution No. 102 of 2008 at a regular meeting of the Pittsburgh Water and Sewer Authority held on September 12, 2008.

!SIGNATURE PAGE FOLLOWS!

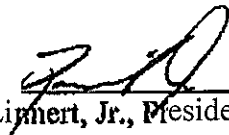
IN WITNESS WHEREOF this Agreement is duly executed on the day and year first above written by the parties hereto, intending themselves to be legally bound hereby.

ATTEST:




JORDAN TAX SERVICE, INC.
Federal ID #25-1319034

By

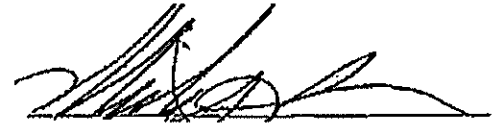

William R. Linnert, Jr., President

ATTEST:

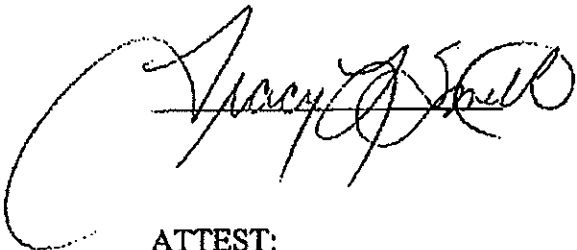


GOEHRING, RUTTER AND
BOEHM, P.C.
Federal ID #5-1291135

By:



Michael G. McCabe, Shareholder

ATTEST:

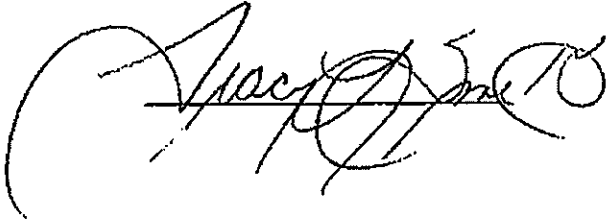


PITTSBURGH WATER AND
SEWER AUTHORITY

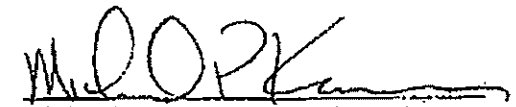
By:


Chairman

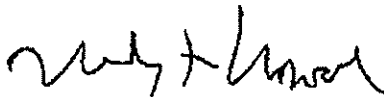
ATTEST:



By:


Michael Kenney, Executive Director

APPROVED AS TO FORM:



Solicitor, Pittsburgh Water and Sewer Authority

RESOLUTION NO. 102 OF 2008

Authorizing an Agreement with the Jordan Tax Service, Inc, and the law firm of Goehring Rutter & Boehm, P.C. for the collection of Delinquent Claims

WHEREAS, the Pittsburgh Water and Sewer Authority (hereinafter "the PWSA") is required from time-to-time to enforce by various means the collection of unpaid taxes, tax claims, tax liens, municipal claims and municipal liens, whether filed or unfilled (hereinafter referred to as "Delinquent Claim" or "Delinquent Claims"); and

WHEREAS, the expense of such enforced collection, and of the recordkeeping and other services related to the collection, filing, satisfaction, assignment and revival of Delinquent Claims, when absorbed by the PWSA constitutes a further demand on die PWSA's resources; and

WHEREAS, Act 1 of 1996 and Act 20 of 2003 amend, among other provisions, §3 of the Pennsylvania Municipal Claim and Tax Lien Law (hereinafter the "Act"), Act of May 16, 1923, PL 207, so that §3, as amended, 53 P.S. §7106 permitting the PWSA, as that term is defined in the Act, to recover reasonable attorney fees in connection with die collection of Delinquent Claims from the persons and property owing such Delinquent Claims; and WHEREAS, the PWSA desires to exercise all such legal authority granted to it under the Act in order to encourage timely payment and collection of Delinquent Claims, and to reduce, if not eliminate, the expense associated with servicing of its Delinquent Claims and with the enforced collection of the same; and

WHEREAS, Jordan Tax Service, Inc. ("Jordan") is a Pennsylvania corporation, having its principal offices at 102 Rahway Road, McMurray, PA 15317, hereinafter referred to as "Jordan" or "Collector"; and WHEREAS, Goeliring, Rutter & Boehm, P.C. ("GRB") is a law firm having its principal offices at 437 Grant Street, 14th Floor, Frick Building, Pittsburgh, PA 15219, and

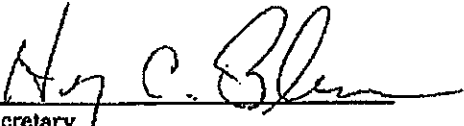
WHEREAS, Jordan and GRB have the necessary experience, expertise, and resources to assist the PWSA as the Collector and Special Legal Counsel, respectively, for the collection of the PWSA's Delinquent Claims; and

WHEREAS, it is believed that the retention of Jordan and GRB would enable the PWSA to efficiently collect its Delinquent Claims,

NOW, THEREFORE, BE IT RESOLVED by the Pittsburgh Water and Sewer Authority, Allegheny County, Pennsylvania, as follows:

NOW, THEREFORE, BE IT RESOLVED that the proper officers of the Pittsburgh Water and Sewer Authority, on behalf of said Authority, are hereby authorized and directed to enter into a Delinquent Claims Agreement with Jordan Tax Service, Inc. and Goehring, Rutter & Boehm, P.C. Said agreement to be in a form approved by the Executive Director and the Solicitor.

DULY ADOPTED AT A REGULAR
MEETING OF THE PITTSBURGH
WATER AND SEWER AUTHORITY
HELD ON SEPTEMBER 12, 2008.


Secretary

PITTSBURGH WATER AND SEWER AUTHORITY

RESOLUTION NO. 103 OF 2008

A RESOLUTION OF THE PITTSBURGH WATER AND SEWER AUTHORITY, ALLEGHENY COUNTY, PENNSYLVANIA, APPROVING AND ADOPTING A SCHEDULE OF ATTORNEY FEES IN CONNECTION WITH THE COLLECTION OF FILED AND UNFILED TAXES, TAX CLAIMS, TAX LIENS, MUNICIPAL CLAIMS AND MUNICIPAL LIENS, PURSUANT TO ACT 1 OF 1996 AND ACT 30 OF 2003 AND APPROVING AND ADOPTING A SCHEDULE OF CHARGES, EXPENSES AND FEES PURSUANT TO THE ACT OF MAY 16, 1923, AS AMENDED, 53 P.S. §7101, §7103, AND §7106, AND ACT 83 OF 2004 WHICH RESOLUTION REPEALS ANY OTHER RESOLUTION INCONSISTENT HERewith RELATING TO A SCHEDULE OF ATTORNEY FEES AND CHARGES, EXPENSES AND FEES.

WHEREAS, the Pittsburgh Water and Sewer Authority (hereinafter "Municipality") is required from time-to-time to enforce by various means the collection of unpaid taxes, tax claims, tax liens, municipal claims and municipal liens, whether filed or unfilled (hereinafter individually referred to as "Delinquent Claim" or collectively referred to as "Delinquent Claims". Delinquent Claims relating solely to taxes shall be referred to as "Delinquent Tax Claims". Delinquent Claims relating solely to Municipal Claims, Municipal Service Fees or Municipal Assessments shall be referred to as "Delinquent Municipal Claims"); and

WHEREAS, the expense of such enforced collection, and of the recordkeeping and other services related to the collection, filing, satisfaction, assignment and revival of Delinquent Claims (hereinafter referred to as "Servicing"), when absorbed by the Municipality constitutes a further demand on the Municipality's resources; and

WHEREAS, Act 1 of 1996 (hereinafter "Act 1") and Act 20 of 2003 (hereinafter "Act 20") amend, among other provisions, §3 of the Pennsylvania Municipal Claim and Tax Lien Law (hereinafter the "Act"), Act of May 16, 1923, PL 207, so that §3, as amended, 53 P.S. §7106 permitting the Municipality, as that term is defined in the Act, to recover reasonable attorney fees in connection with the collection of Delinquent Claims from the persons and property owing such Delinquent Claims; and

WHEREAS, Act 83 of 2004 amends §1, §2, and §3 of the Act, 53 P.S. §§7101, 7103, and 7106, respectively, and permits the Municipality to recover as part of each unpaid Delinquent Claim, among other things, the Charges, Expenses and Fees relating to the failure to pay the Delinquent Claim promptly;

WHEREAS, the Municipality desires to exercise all such legal authority granted to it under the Act in order to encourage timely payment and collection of Delinquent Claims, and to reduce, if not eliminate, the expense associated with Servicing of its Delinquent Claims and with the enforced collection of the same; and

WHEREAS, the Municipality desires to repeal any prior Resolutions which are inconsistent herewith.

NOW, THEREFORE, BE IT RESOLVED by the Pittsburgh Water and Sewer Authority, Allegheny County,, Pennsylvania, as follows:

Article I. Short Title: This Resolution shall be known as the Delinquent Claim, Attorney Fees and Servicing Charges, Expenses and Fees Resolution.

Article II. Expanses Approved:

Section 1. TITLE SEARCH.

In any enforcement proceeding, the actual cost of a title search in an amount not to exceed \$250.00 shall constitute a reasonable expense for each title search necessary for the initiation of each proceeding and compliance with Pa. R.C.P. 3129. The sum not to exceed \$50.00 shall constitute a reasonable expense for each bringdown or update of the tide search in connection with, entry of judgment, issuance of execution, listing for sale, or other action.

Section 2.

Actual out-of-pocket expenses in connection with any enforcement action, such as for postage, non-Sheriff's service of process, investigation of the whereabouts of interested parties and other necessary expenses shall constitute reimbursable expenses as part of each Delinquent Claim recovered.

Article III Attorney Fees Approved:

Section 1. FLAT FEE MATTERS

following schedule of attorney fees is hereby adopted and approved as reasonable attorney fees pursuant to Act 1 and Act 20 for all matters described, which fees shall be awarded to the Municipality, its agents, counsel or assigns hi each action initiated pursuant to the Act for the collection of unpaid Delinquent Claims. The property owner's obligation to pay the full amount of the flat fee for each phase of each action shall accrue upon the initiation of any aspect of each phase. The full amount of each flat fee for each prior phase of the proceeding shall carry over and be due on a cumulative basis together with the flat fee for each subsequent phase.

A. PREPARATION AND FILING OF MUNICIPAL CLAIMS. The sum of \$150.00 shall constitute reasonable attorney fees for foe preparation and filing of a municipal claim as defined under the Act.

B. PREPARATION AND SERVICE OF WRIT OF SCIRE FACIAS OR COMPLAINT IN ASSUMPSIT AS PROVIDED IN THE ACT. The sum of \$450.00 shall constitute reasonable attorney fees for the initiation of each proceeding and shall include preparation and filing of the Praeipce for Writ of Scire Facias or Complaint in Civil Action, Sheriff's direction for service, Notice pursuant

to Pa. R.CJP. 237.1 and the preparation and filing of the Praecipe to Settle and Discontinue the proceeding. The above does not include:

1. Federal Tax Liens, Judgments and Mortgages. Where . . . there are federal tax liens, federal judgments, federal mortgages or other record federal interests, the sum of \$200.00 shall constitute reasonable attorney fees for all matters necessary to properly notify and serve the United States with all required additional Notice and the presentation of related motions to Court.
2. Alternative-Service of Legal Pleadings. In the event that a Special Order of Court is necessary to serve original process or any other pleading, notice, court order or other document, the following amounts shall constitute reasonable attorney fees as follows:
 - a. Investigation of Defendant's whereabouts and preparation of Affidavit of Diligent Search - \$100.00
 - b. Preparation and Presentation of Motion for Alternative Service, and delivery of the Order of Court, along with appropriate directions to the Sheriff for service -\$200.00

C. AMICABLE SCIRE FACIAS OR CONSENT JUDGMENT. The sum of \$400.00 shall constitute reasonable attorney fees for the preparation, filing, monitoring and conclusion of an amicable scire facias or consent judgment, including negotiation, preparation and filing of the pleading, acceptance of service, installment payment and/or forbearance agreement and satisfaction. See 53 P.S. § 7185. Municipality may, in its sole and absolute discretion, hold the amicable Scire Facias or consent judgment and file only in the event of a defendant in the terms and conditions of the amicable scire facias or consent judgment or any related installment or forbearance agreement. If a consent judgment is entered following the filing of Writ of Scire Facias or Complaint In Assumpsit, then the flat fee for entry of the consent judgment shall be the same as that amount provided for in Paragraph D., "ENTRY OF JUDGMENT", below.

D. ENTRY OF JUDGMENT. The sum of \$225.00 shall constitute reasonable attorney fees in connection with entry of judgment which shall include preparation and filing of the Praecipe to Enter Judgment, Notices of Judgment, Affidavit of Non-Military Status and the Praecipe to Satisfy Judgment.

E. WRIT OF EXECUTION - SHERIFF'S SALE OF PROPERTY OR EXECUTION UPON ASSUMPSIT JUDGMENT. The sum of \$ 700.00 shall constitute reasonable attorney fees for preparation of all documents necessary for each execution upon any judgment pursuant to the Act This sum shall include the preparation and filing of the Praecipe for Writ of Execution, all Sheriff's documents, preparation and service of Notices of Sheriff's Sale, garnishments, personal property sales, staying the writ of execution and attendance at one (1) Sheriff's Sale.

1. Postponements. The sum of \$100.00 shall constitute reasonable attorney fees for each continuance of Sheriff's Sale at the request of the defendant.

F. SALE PURSUANT TO §31 OF THE ACT, 53 P.S. §7281. The sum of \$700.00 shall constitute reasonable attorney fees for the sale of property pursuant to §31 of the Act, 53 P.S. §7281 including preparation and service of necessary documents, court appearances, attendance at Sale and preparation of proposed schedule of distribution of the proceeds realized from such Sale.

G. SALE PURSUANT TO §31.1 OF THE ACT, 53 P.S. §7282. The sum of \$500.00 shall constitute reasonable attorney fees for a sale of property pursuant to §31.1 of the Act, 53 P.S. §7282, including the preparation of necessary documents, service, court appearances, and the preparation of proposed Sheriff's Schedule of Distribution.

H. INSTALLMENT PAYMENT AGREEMENT- The sum of \$150.00 shall constitute reasonable attorney fees for the preparation of each written installment payment agreement

I. MOTIONS. The sum of \$200.00 shall constitute reasonable attorney fees for the preparation, filing, and presentation of motions, other than for alternative service, which shall include, but are not limited to, motions to reassess damages, motions to amend caption, motions to continue (he Sheriff's Sale or other execution.

Section 2. HOURLY RATE MATTERS

The following schedule of attorney fees is hereby adopted and approved as reasonable attorney fees pursuant to Act 1 and Act 20, which fees shall be awarded to the Municipality, its agents, counsel or assigns as compensation in all contested matters, and in all other matters not specifically referenced in Article III, Section 1, above, undertaken in connection with the collection of Delinquent Claims:

Senior Attorneys (practicing law for 10 years or more)	\$ 185.00 per hour
Junior Attorneys (practicing law for less than 10 years)	\$ 160.00 per hour
Paralegals	\$ 100.00 per hour
Law Clerks	\$ 65.00 per hour

each as recorded and charged in units of 1/10th of an hour for all time devoted to enforcement and collection of the Municipality's Delinquent Claims. Counsel, whether duly employed or duly appointed by the Municipality, its agents or assigns, shall not deviate from this fee schedule absent a subsequent amendment of the same. Hourly rate matters include, but are not limited to, any matters where any defense, objection, motion, petition or appearance is entered in any phase of any proceeding by or on behalf of any defendant or other interested party.

Article IV. Procedure

A. Required Notice: The Notice required by the Act, as amended, 53 P.S. §7106, shall be provided in accordance therewith and shall be incorporated into an appropriate delinquency notice or notices, sent by the Municipality, its agent, counsel or assigns.

B. Fees, to be Accrued and Delinquent Claims to be Filed: Fees shall accrue for all efforts in collection after the 30th day after the Notice, or after the 30th day of any-required Second Notice-under the Act, as amended, 53 P.S. §7106, on all accounts referred to counsel for enforcement. Fees accumulated as a result of enforced collections shall be certified by duly appointed counsel for the Municipality authorized to pursue collection of Delinquent Claims pursuant the Act, or by counsel for the Municipality's agents or assigns and, if not collected in due course with the debt as by voluntary payment, shall be included in any Delinquent Claims filed on behalf of the Municipality or by its agents' or assigns in the course of enforcement including any Delinquent Claims originally filed with the Prothonotary or Department of Court Records, any Delinquent Claims filed with the Sheriff or in any other Delinquent Claims filed or unfiled or in statements provided where attorney fees are due.

C. The amount of fees determined as set forth above shall be added to and become part of the Delinquent Claim, or Delinquent Claims in each proceeding as provided by the Act and as provided herein.

Servicing Charges, Expenses and Fees Approved:

Article V.

A. Pursuant to § I, §2 and §3 of the Act of May 16, 1923, as amended, 53 P.S. §7101, §7103 and §7106, and specifically in the schedule found in accordance with Act 83 of 2004, the Municipality does hereby authorize the recovery of charges, expenses and fees set forth in Section D below that are incurred by the Municipality or charged to the Municipality by Collectors retained by file Municipality in connection with efforts to collect Delinquent Claims as a result of any persons failure to promptly pay Delinquent Claims.

B. The following schedule of charges, expenses and fees (hereinafter referred to as "Servicing Expenses," "Out-of-Pocket Expenses," and "Postage Expenses") is hereby approved and adopted by the Municipality pursuant to Act 83 of 2004 which amends §1, §2, and §3 of the Act of May 16, 1923, as amended. 53 P.S. §§7101, 7103 and 7106, which amounts are the direct result of each person's or property's failure to pay Delinquent Claims promptly. The Servicing Expenses, Out-of-Pocket Expenses and Postage Expenses established, assessed, and collected hereunder shall be in addition to the record costs, Article HI Attorney fees and Article H Expenses associated with legal proceedings initiated by or on behalf of the Municipality to collect its Delinquent Claims.

C. Servicing of a Delinquent Claim or Delinquent Claims may result in voluntary payment without the initiation of enforcement proceedings. It is the intent of this Article V to pass die cost of Servicing on to the delinquent person or property as part of each Delinquent Claim The recovery of charges, expenses and foes established herein shall not be contingent upon the initiation of enforcement proceedings. However, such charges, expenses and fees are due even where enforcement proceedings are initiated. The purpose of this section is to pass the entire cost and expense associated with delinquent collection on to the delinquent person or property and to make the Municipality whole on all Delinquent Claims collected.

D. Schedule: The following schedule of charges, expenses and fees shall constitute reasonable and appropriate charges, expenses and fees for each indicated category. The charges, expenses and fees shall be added to and become part of the Municipality's Delinquent Claims, together with the face, penalties, interest and costs, if any and title search expense, attorney fees: and out-of-pocket expenses in connection with enforcement proceedings, if any, and shall be payable in full before the discharge or satisfaction of any Delinquent Claim. The below schedule of charge expenses and fees is separate and distinct from any amounts imposed by the Sheriff, Department of Court Records, Court or *any* other public office in connection with the collection of the Municipality Delinquent Claims.

1. Out-of-Pocket Expenses; Actual Out-of-Pocket Expensed in connection with Servicing, including, but not limited to, the expense of title searches, investigators, process servers and other necessary expenses incurred in Servicing shall constitute reasonable Out-of-Pocket Expenses as part of each Delinquent Claim recovered.
2. Municipal No Lien Letter and Tax Certification: The sum of \$25.00 shall constitute a reasonable Servicing Expense for die preparation issuance of each Municipal No Lien Letter relating to-the Municipality's Delinquent Municipal Claims. The sum of \$10.00 per year certified shall constitute a reasonable Servicing Expense for the preparation and issuance of each Delinquent Tax Claim certification.
3. Postage Expense: This Out-of-Pocket Expense shall include the actual cost of postage related to die collection of the Municipality's Delinquent Claims.
4. Servicing Expense:
 - a. A Servicing Expense of 10% of Gross Collections shall constitute a reasonable Servicing Expense for all Servicing related to the collection of the Municipality's Delinquent Tax Claims. A Servicing Expense of 15% of Gross Collections -shall constitute a reasonable Servicing Expense for all Services related to die collection of the Municipality's Delinquent Municipal Claims. Servicing Expenses shall accrue on die first of the month for the entire month, or part thereof. There is no per diem Servicing Expense. Gross Collections for the purpose of calculating Servicing Expenses shall include the face together with penalty, interest and lien costs, if any, for each Delinquent Claim collected. Lien costs ' shall mean charges imposed by the Department of Court Records and/or by the Municipality's Collector for the filing, satisfaction, revival, amendment and transfer of Delinquent Claims. Gross Collections shall not include any record costs, attorney fees, or Out-of Pocket Expenses related to the collection of the Municipality's Delinquent Claims. Liability for payment of charges, expenses and fees, including Servicing Expenses, Out-of-Pocket Expenses and Postage Expenses, shall, be for those Delinquent Claims identified in Article VI, A., below, regardless of whether the Delinquent Claims arc filed as claims in die Allegheny County Department of Court Records Office.

percent (5%) commission previously included in any Delinquent Claim or judgment thereon.

E. Attorney fees, Servicing Expenses and out-of-pocket expenses incurred in pending enforcement proceedings prior to the Effective Date of this Resolution, pursuant to a prior Resolution adopted under Act 1 or Act 20, but not collected, shall remain due and owing in accordance therewith, and shall be incorporated in any future statement, Delinquent Claim, pleading, judgment, or execution. Attorney fees, Servicing expenses and out-of-pocket expenses in any pending or new action incurred after the effective date of this Resolution shall be incurred, charged, and collected in accordance with the schedules and procedures set forth in this Resolution.

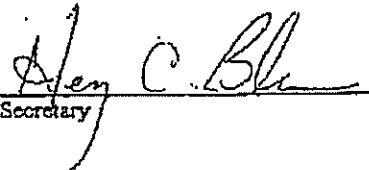
P. The charges, expenses and fees set forth in Article V of this Resolution relate to all unpaid Delinquent Claims in favor of the Municipality, its agents and assigns, and shall be retroactive to the date of each Delinquent Claim.

Article Vh. Assignment: The Municipality may assign the provisions of this Resolution to any assignee of its Delinquent Claims unless the assignment or any applicable law limits the assignee's ability to collect such amounts. The Municipality and its duly authorized agents and their counsel shall retain all rights to charge reasonable attorney fees, charges, expenses, and fees in accordance with the provisions of this Resolution in actions commenced under the Act and for Servicing any Delinquent Claims retained by the Municipality.

Article Vm. Severability. If any one or more of the provisions or terms of this Resolution shall be held invalid for any reason whatsoever, then, such provision or terms shall be deemed severable from the remaining provisions or terms of this Resolution to the maximum extent possible and shall in no way affect the validity or enforceability of any other provisions hereof.

Article IX. Repealer: All prior Resolutions are hereby repealed in whole or in part to the extent inconsistent herewith.

DULY ADOPTED AT A REGULAR
MEETING OF THE PITTSBURGH
WATER AND SEWER AUTHORITY
HELD ON SEPTEMBER 12, 2008.


Secretary

APPENDIX D

PWSA 40-Year Plan

Estimated Replacement Costs for Existing Waterlines; Fire Hydrants and Valves; Water Treatment, Pumping and Storage Facilities; Sewer System

PWSA Estimated Repair Costs from 40-Year Plan

Table D1 – D4 breaks out the estimated repair cost by asset for each category. Estimated repair costs are in 2011 dollars.

Estimated Replacement Cost for Exiting Waterlines

Table D-1

Pipe Diameter (inches)	Pipe Material	Estimated Length (feet)	Installed Unit Cost (1)	Total Cost
1	Copper	3,542	\$31	\$109,802
2	Copper	18,670	50	933,500
4	Ductile Iron	175,022	63	11,026,386
6	Ductile Iron	2,469,029	78	192,584,262
8	Ductile Iron	1,099,859	94	103,386,746
10	Ductile Iron	92,308	109	10,061,572
12	Ductile Iron	566,140	125	70,767,500
15	Ductile Iron	18,166	148	2,688,568
16	Ductile Iron	253,550	156	39,553,800
18	Ductile Iron	1,058	172	181,976
20	Ductile Iron	209,148	188	39,319,824
24	Ductile Iron	85,857	219	18,802,683
30	Ductile Iron	117,803	267	31,453,401
36	Ductile Iron	82,812	315	26,085,780
42	Ductile Iron	24,481	364	8,911,084
48	Ductile Iron	16,150	413	6,669,950
50	PCCP	36,300	453	16,443,900
60	PCCP	56,167	596	33,475,532
66	PCCP	2,170	655	1,421,350
72	PCCP	3,715	719	2,671,085
84	PCCP	3,873	931	3,605,763
90	PCCP	50	1,101	55,050
96	PCCP	4,361	1,272	5,547,192
120	PCCP	524	2,453	1,285,372
Total		5,340,755		\$627,042,000

Source: PWSA 40-Year Plan

Estimated Replacement Cost for Fire Hydrants and Valves

Table D-2

Component	Diameter (inches)	Estimated Quantity	Installed Unit Cost (1)	Total Cost
Hydrants		7,558	2,500	\$18,895,000
Valves	< 4	120	400	48,000
	4	609	785	478,065
	6	14,722	1,050	15,458,100
	8	5,703	1,275	7,271,325
	10	364	1,690	615,160
	12	2,363	2,100	4,962,300
	15	38	4,040	153,520
	16	545	5,975	3,256,375
	18	4	9,190	36,760
	20	321	12,400	3,980,400
	24	189	18,400	3,477,600
	30	154	45,000	6,930,000
	36	93	67,500	6,277,500
	42	32	92,700	2,966,400
	48	51	117,300	5,982,300
50	8	125,500	1,004,000	
60	11	166,400	1,830,400	
72	2	215,500	431,000	
96	1	313,700	313,700	
Subtotal Valves				65,473,000
Total Estimated Replacement Cost for Hydrants and Valves				\$84,368,000

Source: PWSA 40-Year Plan

Estimated Replacement Costs for Water Treatment, Pumping, and Storage Facilities

Table D-3

Category	Facility Name	Estimated Cost
Treatment	Raw Water Intakes	\$3,500,000
	Ross Pump Station	18,853,000
	Clarifiers, Filters, and Chem. Feed	131,100,000
	Sedimentation Basins	37,255,000
	Clearwell	55,756,000
	Highland Membrane Filtration Plant	15,791,000
	Treatment Subtotal	262,255,000
Pumping	Aspinwall Pump Station (1)	14,149,000
	Bruecken Pump Station	11,726,000
	Herron Hill Pump Station	4,598,000
	Herron Hill Tank Pump Station (2)	77,000
	Highland Pump Station	1,495,000
	Howard Pump Station	8,043,000
	Inline Pump Station (3)	219,000
	Lincoln Pump Station	1,206,000
	Mission Pump Station	6,626,000
	Saline Pump Station	1,693,000
	Pumping Subtotal	49,832,000
Storage	Herron Hill Reservoir	6,233,000
	Highland No. 1 Reservoir	62,594,000
	Highland No. 2 Reservoir	65,210,000
	Lanpher Reservoir	69,147,000
	McNaugher Tank No. 1	2,280,000
	McNaugher Tank No. 2	400,000
	Allentown Tank No. 1	1,510,000
	Allentown Tank No. 2	1,510,000
	Bedford Tank	1,190,000
	Brashear Tank No. 1	2,890,000
	Brashear Tank No. 2	2,890,000
	Herron Hill Tank	1,360,000
	Garfield Tank	5,850,000
	Lincoln Tank	1,590,000
	Spring Hill Tank No. 1	390,000
	Spring Hill Tank No. 2	390,000
	Squirrel Hill Tank	1,540,000
Storage Subtotal	226,974,000	
Total Estimated Cost for Treatment, Pumping, and Storage Facilities		\$539,061,000

Source: PWSA 40-Year Plan

Estimated Replacement Cost for Sewer System

Table D-4

Description	Diameter (inches)	Pipe Material	Length (feet)	Installed Unit Cost (1)	Total Cost
Sewers	4	PVC	1,892	\$63	\$119,196
	6	PVC	3,035	74	224,590
	8	PVC	776,734	84	65,245,656
	10	PVC	142,493	95	13,536,835
	12	PVC	650,695	102	66,370,890
	15	PVC	2,771,834	113	313,217,242
	18	RCP	570,348	142	80,989,416
	21	RCP	274,971	157	43,170,447
	24	RCP	337,942	175	59,139,850
	27	RCP	14,213	211	2,998,943
	30	RCP	138,192	230	31,784,160
	33	RCP	24,999	249	6,224,751
	36	RCP	186,113	268	49,878,284
	39	RCP	15,688	291	4,565,208
	42	RCP	79,174	314	24,860,636
	45	RCP	6,319	338	2,135,822
	48	RCP	92,183	361	33,278,063
	54	RCP	55,723	406	22,623,538
	60	RCP	52,652	452	23,798,704
	66	RCP	38,486	522	20,089,692
72	RCP	54,351	593	32,230,143	
78	RCP	25,654	676	17,342,104	
84	RCP	16,849	760	12,805,240	
90	RCP	11,001	839	9,229,839	
96	RCP	20,958	919	19,260,402	
102	PCCP	10,371	1,300	13,482,300	
108	PCCP	9,410	1,681	15,818,210	
120	PCCP	2,832	2,414	6,836,448	
132	PCCP	3,062	2,651	8,117,362	
144	PCCP	6,125	2,890	17,701,250	
168	PCCP	1,028	3,373	3,467,444	
Subtotal Sewers			6,395,327		1,020,543,000
Description			Quantity	Unit Cost	Total Cost
Manholes (2)			29,084	5,650	164,325,000
Catch Basins (2)			24,143	2,825	68,204,000
Diversion Structures (3)			99	95,000	9,405,000
Pump Stations (3)			4	600,000	2,400,000
Subtotal Other Items					244,334,000
Total Estimated Replacement Cost for Sewer System					\$1,264,877,000

Source: PWSA 40-Year Plan

AUDITEE RESPONSE



Pittsburgh
Water & Sewer
Authority

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CITY CONTROLLER'S OFFICE

March 9, 2017

Mr. Michael E. Lamb
City Controller
City of Pittsburgh
414 Grant Street
Pittsburgh, PA 15219

Dear Controller Lamb:

The Pittsburgh Water and Sewer Authority received the Controller's Office performance audit. Our requested changes to the audit have been incorporated into the audit and we respectfully submit the following response:

Recommendation # 1: PWSA board of directors should insist that contract provisions are followed. KPIs should be clear measurable goals, rather than an outline of a list of tasks to be completed by a contractor.

Response: The PWSA Board and staff are committed to ensuring compliance with all contractual obligations.

Recommendation # 2: The PWSA board should avoid hiring companies to manage the authority that require a percentage of cost savings. Agreements like this promote the company's profits over the competent operation of the authority. It would be in PWSA's best interests to hire employees whose allegiance is to PWSA and its efficient and effective operations.

Response: The PWSA Board is engaged in the process to secure competent management for the Authority in a permanent executive director role. Direct employment of other key managers has been underway since 2015.

Recommendation # 3: The PWSA board of directors should work diligently to find an executive director with the knowledge and skills to manage PWSA operations.

Employee retention is imperative and the chosen individual should be able to make a long term commitment. Included in this process should be frequent oversight of the current interim executive director.

Response: The PWSA Board is engaged in the process to secure competent management for the Authority in a permanent executive director role.

Recommendation # 4: The authority needs to hire an in-house general counsel solicitor. This person should offer support, protect the authority and be directed to handle most legal matters.

Response: This position was created and hired in October 2016.



Recommendation # 5: The PWSA board of directors and management need to review legal costs and work toward their reduction.

Response: The PWSA Board agrees to the importance of cost control and has hired internal legal and outside counsel to facilitate the control of legal costs.

Recommendation # 6: PWSA should write on every customer's bill that water quality reports can be viewed online or a copy requested by customer service. If possible PWSA should inform customers what treatment plant their water comes from so that the customer knows which quality report pertains to them.

Response: Limited bill space and custom bill data are not available from the current bill print vendor. PWSA will accomplish this through inclusion of the information in periodic mailers and also on the PWSA website.

Recommendation # 7: PWSA administration should continue the practice of reviewing bills for discrepancies before being mailed. This is a practical solution to solving questionable water consumption bills.

Response: These processes have been in place since early 2016 and will remain a critical part of its review process.

Recommendation # 8: The PWSA administration should require all changes in equipment contracts to run a test or pilot program. Such a test would prove the compatibility of the equipment and eliminate any unforeseen problems and additional costs with the equipment.

Response: While this practice may not apply to all equipment contracts, it will be applied where appropriate.

Recommendation # 9: PWSA administration in future installation contracts should include inspections of completed work. No payment should be made to the contractor without verification that the work was completed accurately.

Response: Some contracts require progress payments prior to completion and inspection, but final payment will not be made without completion of satisfactory inspection results.

Recommendation # 10: PWSA needs to explore the possibility of eliminating this subsidy without raising the rates of customers in Pittsburgh's southern neighborhoods.

Response: PWSA would like to eliminate this cost to its ratepayers and welcome the Controller's leadership in this matter.

Recommendation # 11: Offering PAW customers a payment plan for their sewage bill is a good practice and should be continued. PWSA should make every effort to accommodate each customer's ability to pay. If this situation were to ever happen again, billing should not be skipped; rather an average estimated charge based on the last 4 actual sewage bills should be calculated and mailed to the resident. Then when actual charges are reported adjustments can be made.



Response: PWSA already has initiated payment plans and will adhere to them. PWSA has already instituted a policy to not hold any bills that can possibly be reliably estimated. Estimates must consider the past 12 months of usage to account for seasonality of water and sewage use.

Recommendation # 12: The proposed customer service organization chart should be immediately adopted. It explains management and employee responsibility in a concise way.

Response: PWSA has already implemented this customer service organizational structure and also regularly reviews its structure to optimize its efficiency and effectiveness.

Recommendation # 13: PWSA should upgrade its phone system to a system that can track customer information and the reasons for their call.

Response: PWSA has the Taske phone tracking software that provides limited call statistics. An RFP is planned and budgeted to upgrade this software to a more robust system.

Recommendation # 14: When the PWSA phone number is called there should only be 2 options; 1 for emergencies and/or outages and 2 for all other calls. This would allow emergencies to be identified first, and then under number 2 the other areas of interest could be listed.

Response: This is an excellent suggestion that will be implemented as soon as practicable.

Recommendation #15: Emergency calls should go directly to a live person (Dispatch) to answer and take care of the problem immediately. If only one person is working the emergency line then the system must connect to someone else who can address the problem.

Response: PWSA is currently reviewing its emergency notification and response procedures to ensure proper response to emergency situations. The phone answering process will be structured to facilitate these procedures.

Recommendation # 16: Tracking emails (questions/concerns) is necessary for reporting and research. However, PWSA administration should make sure a category key is used during this tracking to ensure consistency and accurate reporting

Response: Since a new phone system for tracking customer problems will allow for tracking and categorizing of those inquiries, the email tracking system will be consistent with and integrate with that of the phone system.

Recommendation # 17: PWSA customer service needs to establish general categories for recording emails and train personnel in using these categories. This will allow consistency of reporting.

Response: Since a new phone system for tracking customer problems will allow for



tracking and categorizing of those inquiries, the email tracking system will be consistent with and integrate with that of the phone system.

Recommendation # 18: One of the cost saving initiatives by Veolia was for PWSA to own a video camera truck. This truck and the resulting video should be made available to residents with street sewer problems.

Response: These CCTV trucks were purchased to record video on storm sewers, sanitary sewers and combined sewers specifically to address consent order requirements to mitigate sewer system overflows into the rivers. Our current equipment is dedicated to providing video in PWSA sewer mains for capital construction and repair work, and is not readily available for residential sewer work.

Recommendation # 19: PWSA needs to document and map all water and sewer lines throughout the City. It needs to obtain a complete asset management software program to accurately track repairs and new installation of lines.

Response: PWSA has a process to map its assets in a Geographical Information System (GIS). A process is underway to deploy a CMMS system to integrate with the GIS system for more complete management of the assets.

Recommendation # 20: PWSA administration needs to investigate why monthly bills were not being posted online and why there was a delay in scheduling an exoneration hearing. Also the system needs to acknowledge online bill payments in a more timely fashion.

Response: PWSA is engaged in improving its customer service performance and is striving for more accurate and timely response to customers.

Recommendation # 21: PWSA needs to establish a protocol to notify all residents, including tenants, in the surrounding area of a water main break. The street should have been posted with signs explaining the disruption of service and notice of when PWSA expected the problem to be fixed.

Response: PWSA does not currently receive information about tenant occupancy, but is currently exploring options for tenant notification.

Recommendation # 22: Customers enrolled in this monthly automatic bill pay should receive an email before the money is removed stating when it will be deducted and how much. This will allow the customer to contact PWSA if there is an issue before the money is deducted. Auditors found in their research that other utility and bill-pay services do this already.

Response: PWSA currently emails customers prior to the transaction date. Customers are responsible for ensuring that email addresses remain up to date in PWSA systems.

Recommendation # 23: PWSA should study offering an incentive to their customers to promote going green. A joint promotion with a local bank or sporting goods store might be worthwhile or a discount could be offered to the online subscriber.



Response: PWSA promotes its electronic bill options on its website, on its bills and via periodic communications with customers.

Recommendation # 24: PWSA should allow an alternative identifier to create an account in lieu of the account number if a customer does not have it readily available. Other utilities and companies use other personal descriptors such as social security number, address, and zip code or answer a security question in order to access account information. Some companies offer more than one identifier to choose from.

Response: A customer's account number is required at the time of account creation to ensure proper linkage to the correct meter and account. PWSA is exploring options for its customer portal, including alternative methods for subsequent logins to customer accounts.

Recommendation # 25: Customers should be told how much the fee is for the service prior to entering their personal information.

Response: PWSA will update the process to ensure timely notification of any charges in customer transactions. This updated process will be implemented in the RFP for these services due this year.

Recommendation # 26: PWSA should explain on their website and on customer's bills that payments can be dropped off in the lobby of the Penn Avenue offices.

Response: This information is already on the website and on the bills.

Recommendation # 27: If contacting a delinquent customer initially by phone is a new part of the termination of service collection process, then PWSA needs to update section 209.0 Termination of service, "Customer Rights and Obligations" on its webpage.

Response: PWSA has chosen to provide a higher level of service by calling customers earlier in the process to enhance the customer experience. Regulations set a minimum standard of service and do not need to be adjusted at this time.

Recommendation # 28: PWSA board should establish protocol for a sick individual's water to not be turned off. The state regulations provide a 30 day leeway and the board can use that as a guideline and/or partial payment of the bill can also be required to keep the water on.

Response: PWSA has a process for forestalling water service interruption for medical reasons upon submission of a valid document signed by a licensed physician that conforms with all state requirements.

Recommendation # 29: PWSA needs to "clean up" the orphan accounts and verify that these properties can be removed, since bills cannot be mailed for the various reasons mentioned. Because of these accounts, PWSA outstanding bills data is skewed. If they are never going to be paid, they should be removed.

Response: PWSA must retain these records as even accounts on city-owned properties may be condemnations of private property. PWSA will have a valid lien for



these accounts and must track the balance of these accounts. When these properties are subsequently sold, PWSA receives funds to satisfy the liens and this information needs to be kept.

Recommendation # 30: PWSA should work with neighborhoods and initiate a “neighborhood report line” that would allow neighbors to be watchdogs and report the abandonment of buildings in and around their neighborhoods.

Response: PWSA does not have the staff or the mandate to determine standards of abandonment or vacancy as that falls to the City of Pittsburgh. PWSA agrees that that information from the city should be shared with PWSA.

Recommendation # 31: The City-owned delinquent accounts should **not** be included in PWSA's outstanding delinquent balance totals.

Response: PWSA must still maintain information on its valid liens, including those accounts subsequently taken by the city in order to retain the ability to collect when the city disposes of these properties.

Recommendation # 32: PWSA needs to make a decision on how to handle property owned by the City and its water usage. The 1995 agreement between the City of Pittsburgh and PWSA gives the City 600 million gallons of water a year at no charge. Currently, there is no means to calculate City water usage because not all buildings are metered. The authority needs to explore the costs of metering every City-owned building.

Response: PWSA agrees that it is important to meter city properties (including parks, pools, etc.) for system monitoring. With full system monitoring, PWSA will be able to detect where leaks and abnormal usage is occurring potentially reducing water consumption and PWSA cost.

Recommendation # 33: PWSA in conjunction with the City's real estate department and/or the I&P Department should go out and investigate these properties and get an **actual** meter reading. There is a possibility that there has been no water usage at these properties for months or years. If there is no reading the accounts should be deleted out of PWSA's system.

Response: As long as water service and sewer service is still provided on site, water and sewer bills are still valid, even if there is no water consumption. The PWSA minimum charge for water service and sewer service would still apply and any balances that result from those valid charges are still due and owing. The only way to stop the charges are to cut and cap both the water and sewer lines and return the meter to PWSA. Further, to close the account any remaining balance should be paid.

Recommendation # 34: The City Controller's office should stop making water and sewage payments on any estimated bill they receive from PWSA and I&P until an actual meter reading is provided. This should happen even if the Department of I&P approves the bills for payment.



Response: If water and sewer service is still present, charges should continue to be paid. In order to stop the charges, both lines must be cut and capped. If the city departments wish to appeal estimated usage, contact PWSA customer service for a review of the account.

Recommendation # 35: PWSA customer service should stop collecting payments from delinquent payers over 90 days old.

Response: PWSA should continue to collect payment from all customers with past due balances. PWSA does ensure that any payments collected on balances transferred to JTS are remitted to JTS.

Recommendation # 36: PWSA needs to review the process around receiving money for partial payments.

Response: Prior to any extensions or renewals, PWSA will review all of the contract terms with JTS to ensure best value to the ratepayers.

Recommendation # 37: PWSA needs to treat all past due accounts the same whether residential or commercial. Broken payment agreements or non-payment of bills should have their water shut off.

Response: Generally, accounts are treated similarly; however certain accounts cannot have their water shut in the normal course of business (hospitals, schools, etc.).

Recommendation # 38: As recommend in the previous audit, PWSA should frequently reevaluate their contract with Jordan Tax Services to address the fee structure.

Response: Upon expiration of the contract with JTS, PWSA will explore all options for improvement.

Recommendation: # 39: PWSA administration should offer other alternatives for delinquent collections that are more customer friendly and helpful. PWSA administration should work to be included with ALCOSAN's Clean Water Assistance Fund, which is only available for sewer customers and consider a similar fund for PWSA water customers.

Response: In its next rate study, PWSA will explore options for customer assistance programs for lower income customers.

Recommendation # 40: PWSA should not bill for sewage usage if the water is shut off; if water is not being used then sewage is not being used.

Response: PWSA continues to provide sewer service even if water service is not provided. This includes conveyance of storm water and other flows.

Recommendation # 41: PWSA should track the status of past due accounts with Jordan Tax Services.

Response: PWSA continues to track past due balances including those transferred to JTS.



Recommendation # 42: PWSA should work more closely with City officials to develop a similar system to deal with condemned properties. When a property is condemned and a contract offered to have it razed, past due records at PWSA should be exonerated as well. This will enable billing system records to more accurately reflect past due accounts versus having accounts on the books for properties that have not been in existence for many years.

Response: PWSA must still maintain information on its valid liens, including those accounts subsequently taken by the city in order to retain the ability to collect when the city disposes of these properties.

Recommendation # 43: Eliminating lead in PWSA lines should be a top priority of PWSA's administration and board of directors. PWSA should devise a plan to inspect all lines they own to see which ones are still containing lead. If lead lines are detected in the distribution system, PWSA should plan to replace them as soon as possible.

Response: PWSA's current curb box inspection program to identify lead is targeted to achieve this goal. PWSA has plans underway and lead lines are actively being replaced on a schedule after being located.

Recommendation # 44: Households concerned about their water lead level should have their water tested for lead and have their houses and outside service line running from the house to the curb stop box inspected by a plumber for lead piping and replaced.

Response: PWSA recommends that customer identify all sources of lead on their property and take appropriate action. PWSA supports this recommendation by offering free water test kits (including testing and reporting) to all customers in its water service territory.

Recommendation # 45: PWSA should work with a filtration company to offer discounted filters and filtration systems to its customers. An RFP could be awarded guaranteeing a certain amount of purchases. Also, an RFP could be awarded to plumbing companies that are willing to offer City water customers a discount in replacing a home service line. This way price guarantees could be given to customers willing to spend money on removing lead from their lines.

Response: PWSA is currently exploring what it can legally do to assist customers in this endeavor.

Recommendation # 46: Action should be taken against Veolia as they were responsible for the change to caustic soda. This management error of switching corrosive chemicals without informing PA DEP or PWSA board of directors should have never occurred. If a fine is assessed to PWSA because of this PA DEP corrosion control permit violation, Veolia should be the one held responsible to pay it, not PWSA.

Response: PWSA is currently engaged in an action against Veolia.

Recommendation # 47: PWSA needs a better approach at promoting the free lead tests and to educate customers on the dangers of the lead in water. The only way to get



an accurate picture of the lead levels in Pittsburgh is to encourage every PWSA customer in the City to have their lines tested.

Response: PWSA continues to educate all water customers and recommends that customer identify all sources of lead on their property and take appropriate action. PWSA supports this recommendation by offering free water test kits in its water service territory.

Recommendation # 48: PWSA needs a CMMS to improve their asset management capabilities and accuracy.

Response: A process is underway to select a CMMS system to integrate with the GIS system for more complete management of the assets.

Recommendation # 49: PWSA needs to establish a realistic comprehensive line replacement plan of action for both water and sewer lines. A map needs to be made where the most recent emergency repairs have been needed in order to determine a pattern of failure and with that determination plans for future line replacements.

Response: This is a process that PWSA currently performs and will continue to perform.

Recommendation # 50: PWSA and the City of Pittsburgh's administration must work together to approve new development projects. Between the PWSA board of directors and City council the process must be changed to require input from PWSA's engineers on all blueprints. PWSA might consider scheduling an engineer to review new plans once or twice a week at the City's Permits counter.

Response: The City of Pittsburgh should change the permitting process to condition approval of all development projects on PWSA approval on water and sewer system plans per PWSA's Procedure Manual for Developers. This PWSA approval would result in adherence to the request by the PA DEP of the city to coordinate its issuance of building permits only after sewage facilities planning approval.

Recommendation # 51: As stated in Recommendation No. 48, PWSA needs a **Computerized Maintenance Management System (CMMS)** to improve their asset management capabilities and accuracy. If the manpower and training is not available for this type of system then PWSA needs to implement some form of comprehensive asset management system. PWSA administration needs to make this a top priority.

Response: A process is underway to select a CMMS system to integrate with the GIS system for more complete management of the assets.



Thank you and your team for providing a thorough performance review. The recommendations, many of which are already actioned, are appreciated and will be taken seriously. This audit will aid in achieving our mission to provide quality water service.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Robert A. Weimar', with a long horizontal flourish extending to the right.

Robert A. Weimar
Interim Executive Director

Cc: PWSA Board of Directors
Chief Kevin Acklin