



**PENNSYLVANIA
PUBLIC UTILITY COMMISSION
STAFF REPORT**

***Inquiry into Philadelphia Gas Works'
Pipeline Replacement Program***

APRIL 21, 2015

P E N N S Y L V A N I A
P U B L I C U T I L I T Y C O M M I S S I O N
S T A F F R E P O R T

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APRIL 21, 2015

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I. EXECUTIVE SUMMARY

Philadelphia Gas Works (PGW or Company), as a certificated city natural gas distribution operation, is regulated by the Pennsylvania Public Utility Commission (PUC or Commission) with respect to rates and service. The Commission's Bureau of Investigation and Enforcement, Bureau of Technical Utility Services and Bureau of Audits (collectively, Staff) have prepared this report to summarize the condition of PGW's current pipeline infrastructure and its current pace of main replacement. The report also discusses possible opportunities and obstacles to accelerate the Company's pipeline replacement rate.

Operating since 1836, PGW is owned by the City of Philadelphia (City) and is the largest municipally owned gas utility in the nation. PGW maintains a distribution system of approximately 3,000 miles of gas mains and 475,000 service lines, and provides gas service to approximately 500,000 residential, commercial and industrial customers in Philadelphia. Since PGW came under the jurisdiction of the Commission in July 2000, PGW has had the obligation to provide adequate, safe and reasonable utility service.¹ To monitor PGW's compliance with this obligation, the Commission enforces federal pipeline safety regulations concerning the design, operation, inspection, replacement and maintenance of pipeline facilities in order to protect people and the environment from the risks of transporting natural gas by pipeline.

An assessment of PGW's pipeline infrastructure is necessary because approximately 66 percent of its system is comprised of cast iron and unprotected steel, both of which are high-risk pipe that pose a potential threat to life and property in PGW's service territory. Cast iron pipe became popular in the early 1900s and is among the oldest pipe still in service in the country. Approximately 1,500 miles of PGW's 3,024 miles of main in service are cast iron, which is more than double the miles of cast iron of any other natural gas distribution company (NGDC) in the state. Pennsylvania currently has the fourth-highest amount of cast iron mains nationwide, and approximately half of Pennsylvania's cast iron is located on PGW's system.

Unprotected steel mains, like cast iron, also pose a corrosion risk because of the lack of cathodic protection. PGW has approximately 493 miles of unprotected steel still in service. With its 1,500 miles of cast iron and 493 miles of unprotected steel, PGW has the highest percentage of high-risk pipe in the ground when compared to any other large NGDC² in the Commonwealth by a factor of two. Moreover, PGW's gas mains are among the oldest in the state, with more than 1,170 miles installed before 1940.

¹ 66 Pa. C.S. § 1501.

² Staff has defined large natural gas distribution companies as Section 1307(f) gas utilities with gross intrastate annual operating revenues in excess of \$40 million. 66 Pa. C.S. § 1307(f), 52 Pa. Code § 53.63.

Given the amount of at-risk mains and the age of those mains, PGW experienced more than double the number of hazardous³ leaks than any other NGDC in 2013. Furthermore, PGW's leak rate increased in 2014. PGW discovered approximately 6,200 total leaks in 2013, of which 3,122 leaks were classified as hazardous. In 2014, PGW discovered 7,600 total leaks and its hazardous leaks increased to 3,448. PGW's aging infrastructure and leak rates are particularly concerning, given that its territory is largely urban and is a high-population area, which can pose a potential threat to life and property.

Most Pennsylvania NGDCs are targeting the removal of all cast iron pipe in approximately 13 to 22 years. PGW's current infrastructure improvement plan is to remove all cast iron pipes in 88 years. It is worthwhile to note, however, that PGW replaced 28 miles of cast iron and two miles of unprotected steel in 2014. At PGW's 2014 replacement rate, it would take 52.5 years to remove all cast iron and 65.5 years to remove all at-risk pipe in PGW's distribution system. Despite the fact that PGW accelerated its replacement efforts in 2014, Staff believes this replacement rate is not aggressive enough, given the risk this pipe poses to PGW's system and its customers.

Pursuant to Section 331(b)(4) of the Public Utility Code, the Chairman directed Staff to conduct an inquiry and analysis of PGW's pipeline replacement program, including the need for, and any impediments to, the expansion of that program to protect the public interest.⁴ Based on its investigation, Staff has identified the following areas of opportunity that PGW should explore to increase its main replacement rate to ensure that its customers receive safe, adequate and reliable service:

1. Increase the DSIC Above the Current 5-Percent Cap
2. Levelize and Annualize DSIC-Eligible Costs
3. Issue New Debt
4. Improve Cash Management
5. Request that the City of Philadelphia Waive All or a Portion of the \$18-Million Payment
6. Streamline Corporate Governance Structure
7. Consolidate Facilities

³ Hazardous leaks represent an existing or probable hazard to persons or property and require immediate repair.

⁴ 66 Pa. C.S. § 331(b)(4).

Opportunity No. 1 – Increase the DSIC Above the Current 5-Percent Cap

PGW should seek to increase its Distribution System Improvement Charge (DSIC) from the current 5-percent rate cap to some higher level. The Commission has the authority to grant approval of petitions to raise DSIC rates above 5 percent to ensure and maintain adequate, efficient, safe, reliable and reasonable service.⁵ Additionally, because PGW is a city natural gas distribution operation, the Commission may suspend or waive the application of provisions of the Public Utility Code to PGW.⁶ If the DSIC cap were raised to 7.5 percent, 10 percent or 12 percent, the additional amount of capital annually available for infrastructure improvement would be an estimated \$11.9 million, \$23.8 million and \$33.3 million, respectively.⁷ At PGW's current replacement cost per mile, this would increase PGW's pipeline replacement from 18 miles by up to an additional nine miles per year under the 7.5-percent cap; up to 18 additional miles under the 10-percent cap; and up to 23 additional miles under the 12-percent cap. These increased caps would cost PGW's customers using an average 83 Mcf per year an additional \$18.95 annually, or \$1.58 monthly, for a DSIC under a 7.5-percent cap; \$37.89 annually, or \$3.16 monthly, for a DSIC under a 10-percent cap; and \$53.06 annually, or \$4.42 monthly, for a DSIC under a 12-percent cap. Moreover, since PGW likely could not ramp up personnel/contractors immediately to reach a replacement rate corresponding to a 10-percent or 12-percent DSIC, the Company could decide to phase in the higher DSIC cap and resulting rates over a three- to five-year period at each DSIC cap level, which would mitigate the impact to customers. While increasing the DSIC poses some challenges, particularly to PGW's low-income customers, it is important to note that both Philadelphia City Council and the Company have expressed an interest in increasing the DSIC to 7.5 percent.⁸

Opportunity No. 2 – Levelize and Annualize DSIC-Eligible Costs

PGW should consider seeking changes to the method by which it implements its DSIC mechanism. Unlike other utilities, due to PGW's cash-basis accounting and unique rate structure, its DSIC is currently designed to fully recover actual eligible expenditures from the past quarter in a subsequent quarter. This is not ideal because it results in significant DSIC rate fluctuations, which vary throughout a given year. DSIC mechanisms employed by other companies typically see DSIC rates progressively increase from one rate case to the next. As a result of PGW's mechanism, however, the lowest rates are being applied during the high sales volume quarter, resulting in less annual revenue recovery than intended. If PGW's cash-basis DSIC was designed similarly to the methodology generally used for other non-DSIC adjustment clauses or pass-through mechanisms, DSIC rates and recovery would be more levelized. Staff's analysis indicates it may be beneficial for PGW to annualize its DSIC costs and use a more typical adjustment clause, annual projections and an

⁵ 66 Pa. C.S. § 1358(a).

⁶ 66 Pa. C.S. § 2212(c).

⁷ Increasing the DSIC cap above 5 percent would require Commission approval, and nothing in this report is intended to presuppose such approval.

⁸ Appendix A and B.

annual reconciliation process,⁹ because this would facilitate the recovery of additional DSIC revenue that could be used to further expedite main replacement.

Opportunity No. 3 – Issue New Debt

PGW should explore whether any benefit lies in issuing new debt to fund an aggressive pipeline replacement program. PGW's long-term debt-to-total capitalization has been steadily decreasing and is projected to continue to do so. Long-term debt as a percentage of PGW's total capitalization is projected to fall from 67.6 percent in 2015 to 56.4 percent in 2020. As a municipally owned utility, it is Staff's opinion that PGW can operate with a long-term debt-to-capital ratio perhaps as high as 70 percent. Issuing new debt up to that level could be a method by which PGW could fund acceleration of its pipeline replacement. Additionally, financing infrastructure improvement this way better matches the recovery of these capital expenditures with the useful life of the capital asset which, in turn, matches recovery of cost from the ratepayers who benefit over time from the utility incurring the cost.

Opportunity No. 4 – Improve Cash Management

PGW can reduce its cash liquidity to leverage additional funds for pipeline replacement. Currently, PGW maintains a \$100-million cash balance, which PGW has indicated is necessary. During Fiscal Year 2014, PGW's monthly cash balances ranged from a high of \$159.5 million to a low of \$61 million. During Fiscal Year 2013, PGW's monthly cash balances ranged from a high of \$133.8 million to a low of \$28.2 million. It is Staff's position that PGW could reduce its \$100 million cash on hand to \$75 million, making an additional, one-time amount of \$25 million available for pipeline replacement without jeopardizing its ability to cover all of its expenses.

Opportunity No. 5 – Request that the City of Philadelphia Waive All or a Portion of the \$18-Million Payment

The Commission cannot require the City to forgo the \$18-million annual payment from PGW to which it is entitled by law. However, the City of Philadelphia could agree to waive all or a portion of the \$18-million payment it receives annually from PGW, as it has done in the past, so that those funds can be used as an additional source of capital funding for pipeline replacement. PGW has requested and received a waiver of the payment in the past. From 2004 through 2010, the City "granted back" the payment to PGW due to its weak financial position. If the City would agree to reinstate a waiver for all or a portion of the annual \$18-million payment, this money could be put toward pipeline replacement and could result in approximately 14 miles of additional pipe replaced annually and mitigate the impact of higher customer rates.

⁹ A reconciliation process would be used to ensure that only costs actually incurred are ultimately recovered through the adjustment clause mechanism.

Opportunity No. 6 – Streamline Corporate Governance Structure

Currently, PGW's local governance structure involves action by the Mayor, City Council, City Controller, the Philadelphia Gas Commission (PGC) and the Philadelphia Facilities Management Corporation (PFMC). Since 2000, the PUC was granted authority to set rates and oversee customer-service and safety standards of this municipally owned system. PGW's unique governance structure has been identified as an issue in multiple management and operations audits. Specifically, a 2001 PUC Management Audit, which recommended the elimination of the PGC, showed that elimination of this layer of governance would reduce expenses at that time by \$1.3 million. In Fiscal Year 2013, PGC expenses totaled approximately \$800,000. If the PGC were eliminated, this \$800,000, or a portion thereof, could be used for accelerated pipeline replacement.

Opportunity No. 7 – Consolidate Facilities

PGW has recognized that its warehouse configuration and associated processes are inefficient and has proposed to consolidate warehouses, meter shops, field services and fleet operations as part of its Real Estate Rationalization initiative. In 2008, PGW conducted a study into these possibilities and found potential annual savings of up to \$5 million due to increased productivity, reduced inventory and inventory-handling costs, reduced travel time for the field crews and reduced operating and capital costs. As of February 2015, PGW hired a consultant to update this study. Operational improvements of this nature contemplated by PGW could yield substantial savings, which could allow PGW to provide better service to its customers and potentially dedicate more money to its pipeline replacement program.

Summary

The table on the following page summarizes the seven opportunities and the impact they could have on accelerating PGW's pipeline replacement rate. Additionally, the table highlights challenges that exist to implementing the identified opportunities, such as the impact on customer bills and PGW's unique corporate governance structure. Implementing these measures would provide additional revenue sources or reduced operating expenses for PGW to accelerate its current pipeline infrastructure replacement rate.

Table 42: Summary of Opportunities and Impacts

Opportunity	Potential Incremental Funds Available for Main Replacement ^a	Funds Guaranteed to be Used for Infrastructure Improvement?	Potential Reduction of Replacement Years from 2014 Levels ^b	Total Potential Replacement Timeframe (years) ^c	Impact on Customer Bills ^d	Challenges	
1	Increase DSIC from 5%:						Waiver required by PUC
	To 7.5%	Up to \$11 million annually	Yes	14.5	51.5	Low	
	To 10%	Up to \$22 million annually	Yes	23.8	42.2	Medium	
	To 12%	Up to \$31 million annually	Yes	29.2	36.8	Medium	
2	Levelize and Annualize DSIC	Up to \$5 million annually	Yes	7.5	58.5	Low	
3	Issue New Debt	Potentially \$33 million annually	No	30.2	35.8	Lower initially; higher in future (see Table 39)	Increased financial leverage which may affect PGW's bond ratings and may increase borrowing costs
4	Improve Cash Management	Potentially \$25 million one-time	No	0.6	65.4	None	Less financial flexibility for PGW
5	Use Annual Payment to City	Up to \$18 million annually	No	20.5	45.5	None	Action required by City of Philadelphia
6	Streamline Governance	Up to \$800,000 annually	No	0.4	65.6	None	Action required by City of Philadelphia
7	Consolidate Facilities	Up to \$5 million annually	No	7.5	58.5	None	Unknown implementation costs

- a: Potential dollars are calculated based upon various assumptions and are therefore an estimate of likely impact.
- b: For illustrative purposes only. Reductions of replacement rates are not additive. The 2014 at-risk pipeline replacement timeframe is 66 years at a cost of \$1,314,051 per mile.
- c: For illustrative purposes only. Replacement rates assume that: 2014 replacement efforts remain steady, costs to replace remain steady at 2014 costs, no inflation, all potential dollars from the opportunity are used for main replacement, etc.
- d: Low = less than 2-percent increase in average total customer bill; Medium = between a 2- and 5-percent increase in average total customer bill; High = greater than 5-percent increase in average total customer bill.

Other Considerations

Liquefied Natural Gas (LNG) Expansion

PGW and City Council are currently exploring options to more efficiently utilize its two LNG facilities. These options involve expanding sales to new transportation markets, such as long-haul trucking fueling, Marcellus drilling pad fueling and marine and export applications. PGW should continue to explore these opportunities and analyze what value, if any, there is for its regulated customers and its infrastructure improvement. Any change in ownership, use or capabilities of the LNG facilities, however, would require extensive study by PGW and corresponding due process by the governing bodies.

Pursue Strategic Alternatives

PGW also should consider pursuing strategic alternatives by which it may increase its pipeline replacement. These involve various PGW structural alternatives, including enhanced status quo, privatization and a management-services agreement. Under an enhanced status quo structure, PGW would retain its current organizational structure, but with potential improvements. Privatization alternatives include a strategic sale, a public-private partnership or an initial public offering. Under the management services agreement alternative, the City would enter into a contract with a third-party operator while retaining ownership of PGW. It is worthwhile to explore these structural alternatives to determine what, if any, impact it will have on PGW's infrastructure improvement.

Finally, Staff would like to thank PGW for its cooperation in this matter by responding to numerous data requests and its willingness to engage in discussions concerning the financial, operational and safety components of its distribution system. Accelerating PGW's infrastructure replacement will require a coordinated effort among the Company, its local governing entities and the Commission. Continued cooperation will ensure that PGW has the necessary resources to provide "adequate, efficient, safe and reasonable service and facilities" to its 500,000 customers.¹⁰

¹⁰ 66 Pa. C.S. § 1501.

II. PGW OVERVIEW

PA PUC Regulation

Operating since 1836, PGW is owned by the City of Philadelphia. Prior to July 1, 2000, PGW was under the jurisdiction of the PGC, a departmental commission of the City of Philadelphia, under the Philadelphia Home Rule Charter. The PGC exercised regulatory control over PGW, including fixing and regulating gas rates consistent with City ordinances.

On June 22, 1999, Governor Tom Ridge signed into law the *Natural Gas Choice and Competition Act (Act)*. The Act revised the Public Utility Code by adding Chapter 22, relating to restructuring of the natural gas utility industry. The Commission was charged with implementing the Act. Section 2212(b) of the Act provides that public utility service being furnished or rendered by a city natural gas distribution operation within its municipal limits will be subject to regulation and control by the Commission, with the same force as if the service were rendered by a public utility.¹¹ Accordingly, as of July 1, 2000, the Commission was given jurisdiction over PGW.

Under Section 1501 of the Public Utility Code, the Commission has a statutory mandate to ensure the provision of adequate, safe and reasonable utility service by jurisdictional utilities.¹² The U.S. Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) administers the national regulatory program to protect people and the environment from the risks of transporting hazardous materials by pipeline. The Commission is authorized to enforce these federal pipeline safety regulations concerning the design, installation, operation, inspection, testing, construction, extension, replacement and maintenance of pipeline facilities as an agent for the DOT.¹³ As such, the Commission directs and enforces safety standards for pipeline facilities and regulates safety practices of certificated utilities engaged in the transportation of natural gas. While the federal regulations establish the minimum safety standards for gas facilities in the Commonwealth, the Commission has the authority to impose additional pipeline safety standards over and above federal standards, provided they are not in conflict.

Soon after the Commission assumed jurisdiction over PGW, the condition of its distribution system was identified as a concern. In September 2000, the Commission noted the age of PGW's distribution system and the fact that it had the highest percentage of cast iron in the United States, and it ordered PGW to develop a plan for more aggressive pipeline inspections and leakage surveys.¹⁴ In November 2000, the Commission ordered PGW to achieve a 1-percent annual cast

¹¹ 66 Pa. C.S. § 2212(b).

¹² 66 Pa. C.S. § 1501.

¹³ 52 Pa. Code § 59.33(b).

¹⁴ *Gas Safety Plan for Philadelphia Gas Works*, A-125042 (Order entered Sept. 13, 2000).

iron replacement rate.¹⁵ PGW has complied with, and has often exceeded, the 1-percent annual main replacement rate established in 2000.

Rate Increases

As discussed below, PGW's financial condition has improved considerably since coming under Commission jurisdiction, as PGW has increased distribution rates regularly, recovered gas costs annually through a reconcilable surcharge and made infrastructure improvements through the Distribution System Improvement Charge (DSIC).

Prior to the Commission assuming jurisdiction over PGW, the Company had not increased base rates since 1991.¹⁶ The Commission assumed jurisdiction over PGW on July 1, 2000, and since that time, the Commission has approved approximately \$170,558,000 of annual base rate relief requests by PGW:

- Petition for Establishment of Interim Rate Procedures: Docket No. R-00005654 (Order entered Nov. 22, 2000). PGW requested interim rate relief of \$52,000,000; the Commission granted \$11,000,000.
- General base rate case: Docket No. R-00006042 (Order entered Dec. 6, 2001). PGW requested \$65,000,000 in additional annual revenues; the Commission granted \$22,558,000.
- General base rate case: Docket No. R-00017034 (Order entered Aug. 8, 2002); and, Petition for Extraordinary or Emergency Rate Relief: Docket No. R-00017034F0002 (Order entered April 12, 2002). PGW requested \$60,000,000 in additional annual revenues and, of the \$60,000,000, PGW requested that \$44,000,000 be approved as extraordinary rate relief. The Commission granted \$36,000,000 in extraordinary rate relief in April 2002, and approved a general rate increase equal to the \$36,000,000 extraordinary rate award.
- General base rate case: Docket No. R-00061931 (Order entered Sept. 28, 2007). PGW requested \$100,000,000 in additional annual base rate revenues; the Commission granted \$25,000,000.
- Petition for Extraordinary or Emergency Rate Relief: Docket No. R-2008-2073938 (Order entered December 19, 2008). PGW requested \$60,000,000 in additional annual base rate revenues; the Commission granted the full \$60,000,000 increase.

¹⁵ *Pa. PUC v. PGW*, Docket No. R-00005654, pp. 27-29, 33 (Order entered Nov. 22, 2000).

¹⁶ *Stratified Management and Operations Audit of PGW*, p. X-1, January 2001.

- General base rate case: Docket No. R-2009-2139884 (Order entered July 29, 2010). PGW requested \$42,500,000 million in additional annual revenues; the Commission granted \$16,000,000.

In addition to the rate increases detailed above, certain NGDCs under Commission jurisdiction, like PGW, are entitled to annual review and recovery of their natural gas costs. The cost of natural gas is the single greatest expense for PGW and it comprises the largest component of a typical heating bill. Under Commission jurisdiction, PGW is allowed to recover 100 percent of its natural gas costs on an annual basis through a separate surcharge mechanism. The surcharge is reviewed and reconciled annually, which reduces the regulatory lag associated with recovery of this expense. PGW's gas cost rates have historically been among the highest in the state. However, due to recent price reductions in the energy market, all Pennsylvania NGDCs are passing the corresponding natural gas cost savings through to customers via the fuel adjustment clause of their tariffs. Although all NGDCs have different supply contracts and interstate pipeline delivery opportunities (plus varying over-/under-collections from prior periods), which make comparison complicated, PGW is taking advantage of lower fuel costs and could see future reductions in its gas cost rates.

PGW also has the opportunity to recover costs associated with capital investments on its distribution system to improve service reliability through its DSIC. The DSIC, permitted under Act 11 of 2012, encourages utilities to accelerate investments in aging infrastructure. Before Act 11, utilities would have to file a base rate case in order to recover infrastructure investments. However, Act 11 now reduces this regulatory lag by allowing utilities to recover the cost of certain distribution improvement projects between base rate cases through the DSIC surcharge. PGW's DSIC was approved by the Commission in May 2013 and implemented in July 2013.¹⁷ Since PGW's DSIC was implemented in July 2013, PGW has included approximately \$31,556,000 for infrastructure improvements in its DSIC surcharge.

Although PGW's financial position has improved considerably due to regular base rate increases, annual recovery and reconciliation of gas costs and recovery of infrastructure costs through the DSIC, its pipeline infrastructure remains among the riskiest in the Commonwealth, given the volume of cast iron and unprotected steel pipe.

¹⁷ *Petition of Philadelphia Gas Works for Approval of a Distribution System Improvement Charge*, Docket No. P-2012-2337737 (Order entered May 9, 2013).

III. BENCHMARKING PGW'S CURRENT INFRASTRUCTURE

AMOUNT OF CAST IRON AND UNPROTECTED STEEL PIPE

Cast iron pipelines were originally constructed to transport manufactured gas beginning in the 1870s and became popular in the early 1900s. PHMSA recognizes that the degrading nature of iron alloys, the age of the pipelines and pipe joint design have greatly increased the risk involved with continued use of cast iron pipelines. An additional threat to cast iron is earth movement, such as disturbance caused by digging, seasonal frost heave or changes in groundwater levels. There are approximately 3,115 miles of cast iron mains in the Commonwealth, and approximately 1,500 of those miles are in PGW's distribution system. This poses significant safety concerns because, given the nature of PGW's urban service territory, gas is more likely to migrate to a building and cause harm to life or property.

Similarly, unprotected steel pipe was used extensively until the 1960s, when the use of plastic pipe expanded. The unprotected steel pipe is either bare steel or coated steel that is not cathodically protected.¹⁸ The lack of an outer coating on bare steel exposes it to the environment and subjects the steel to corrosion. Unprotected, coated steel also is considered to be at risk due to the lack of cathodic protection. In the early 1970s, PHMSA added additional requirements to control external corrosion on buried or submerged pipelines. Under these new requirements, each buried or submerged pipeline installed after July 31, 1971, had to be protected against external corrosion.¹⁹ For steel pipe, a cathodic protection system designed to protect the pipeline in accordance with PHMSA requirements had to be installed and placed in operation within one year of completion of construction. These new requirements addressed steel pipe installations post-1971, but they do not apply to pipe already in service. Therefore, unprotected steel pipe mains and services installed pre-1971 continue to corrode and must be replaced.

Although pre-1971 unprotected steel pipe mains and services are at risk, cast iron is more risky. Cast iron has low beam strength²⁰ and is subject to graphitization, which makes it more brittle and susceptible to complete and partial main breaks with large volumes of gas exiting the main, with little to no warning. The potential for these catastrophic failures of cast iron distinguishes it from unprotected steel, which is more likely to develop slow leaks that can be detected over time.

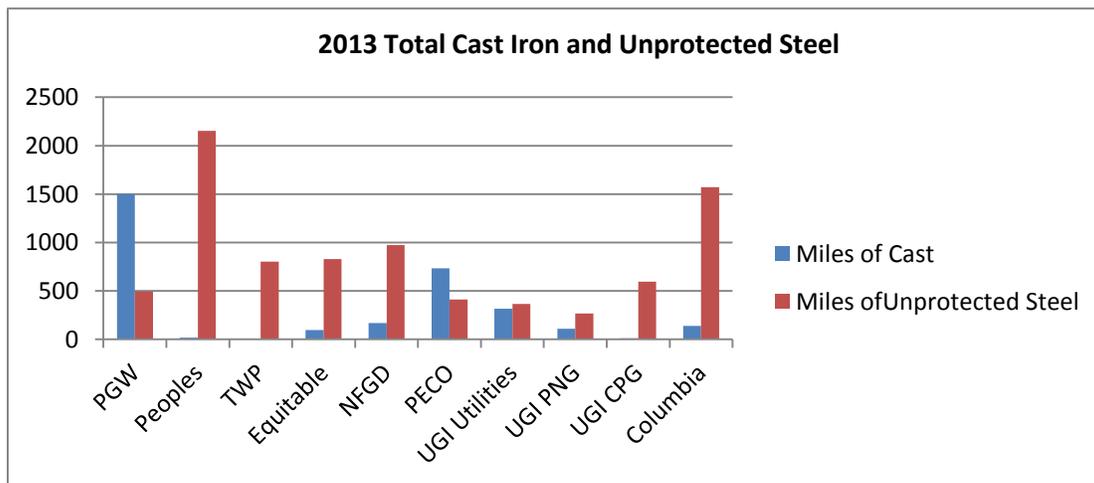
¹⁸ Cathodic protection is defined as a technique to prevent the corrosion of a metal surface by making that surface the cathode of an electrochemical cell.

¹⁹ 49 CFR § 192.455.

²⁰ The beam strength of a pipe is dependent upon the yield stress of the material from which the beam is manufactured, thereby defining the maximum load that may be applied before it will permanently deform, or break, if a brittle material such as cast iron.

In this report, at-risk pipe is defined as cast iron and unprotected steel. As shown in Table 1, in 2013, PGW had a total of 1,994 miles of at-risk main, comprised of 1,501 miles of cast iron and 493 miles of unprotected coated steel. This table also shows the miles of cast iron and unprotected steel in service at Pennsylvania’s largest NGDCs. Although Table 1 shows that Peoples had a significant amount of unprotected steel, it had 6,786 total miles of mains in service. Therefore, as illustrated in Table 2, Peoples system is comprised of 32 percent of at-risk pipe. In contrast, 1,994 (66 percent) of PGW’s total 3,024 miles of main is at risk. This is the highest percentage of at-risk pipeline versus total mile of main of any of the other large NGDCs in Pennsylvania by a factor of at least two.

Table 1: 2013 Total Cast Iron and Unprotected Steel in PA²¹



PGW reduced its cast iron mains from approximately 1,501 miles to 1,473 miles in 2014. The 2014 data is not currently available for the other large NGDCs; however, it is expected that PGW will continue to have significantly more miles of cast iron main in service than its peer NGDCs.

As shown in Table 2, PGW has approximately 50 percent of all cast iron pipeline in Pennsylvania. However, only 6.6 percent of Pennsylvania’s statewide distribution system is cast iron. Overall, Pennsylvania NGDCs have 2.74 times more unprotected steel than cast iron piping. Unprotected steel makes up 18.2 percent of Pennsylvania’s statewide distribution system.

²¹ 2013 DOT Annual Report.

Table 2: NGDC Type of Main 2013²²

NGDC	Total Miles of Main	Miles of Cast	Miles of Unprotected Steel	% At-Risk Main
Columbia	7,411	138	1,571	23%
Peoples	6,786	17	2,154	32%
Equitable	3,523	96	830	26%
National Fuel	4,827	169	975	24%
PECO	6,741	734	411	17%
PGW	3,024	1,501	493	66%
UGI Utilities	5,487	316	367	12%
UGI CPG	3,716	11	596	16%
UGI PNG	2,522	109	269	15%
Peoples TWP	2,624	-	804	31%
Total	46,661	3,091	8,470	

Additionally, Table 3 shows that PGW has some of the oldest mains in service in Pennsylvania. Approximately 38 percent of its mains were installed before 1940. The 10 large NGDCs in the Commonwealth have a combined 4,539 miles of main in service installed prior to 1940. Of those combined miles, 1,171 miles (approximately 26 percent) are on PGW's distribution system. At the end of Calendar Year 2014, this mileage had been reduced to 1,148.

Table 3: Vintage of Main in Service for Large NGDCs²³

Company	Miles of main installed w/ unknown installation date	Miles of main in service installed pre-1940	Miles of main in service installed 1940-49	Miles of main in service installed 1950-59	Miles of main in service installed 1960-69	Miles of main in service installed 1970-79	Miles of main in service installed 1980-89	Miles of main in service installed 1990-99	Miles of main in service installed 2000-09	Miles of main in service installed 2010-present	Total main in service
PGW	0	1171	198	508	354	176	215	131	177	94	3,024
TWP	0	399	59	159	477	384	324	364	351	107	2,624
Peoples	842	272	364	890	1195	828	675	809	714	199	6,786
UGI Utilities	2	474	73	529	727	420	692	1,074	1,214	283	5,487
UGI CPG	683	42	27	127	437	450	613	843	409	86	3,716
UGI PNG	4	154	5	106	676	309	368	523	313	64	2,522
PECO	-	614	150	587	1,221	730	1,057	1,359	878	166	6,761
Equitable	0	465	86	233	447	491	498	583	618	103	3,523
Columbia	485	511	183	844	1,003	563	1,065	1,086	1,159	512	7,411
National Fuel	127	437	106	444	654	729	842	817	498	173	4,827
Total:	2,143	4,539	1,251	4,427	7,190	5,080	6,347	7,588	6,330	1,786	46,681

²² DOT Annual Reports and Staff analysis.

²³ DOT Annual Report.

POTENTIAL FOR PIPELINE FAILURE

While cast iron and unprotected steel are both at risk, cast iron main is more risky than unprotected steel. Cast iron is prone to catastrophic failure, while unprotected steel is more likely to develop slow leaks, which can be detected over a period of time. For example, across the state, there were no corrosion-related deaths from 2001 to 2010; however, from 2011 to 2015, there were six corrosion-related deaths, all of which were on cast iron main.

According to DOT, nationwide gas distribution incident²⁴ reports from 2005 through 2013 show that 10.5 percent of the incidents occurring on gas distribution mains involved cast iron mains, while on average only 2.5 percent of distribution mains are cast iron. The frequency of incidents on cast iron mains is more than four times that of mains made of other materials. Cast iron main incidents also are more likely to result in a fatality. Thirty-eight percent of cast/wrought iron main incidents caused a fatality, compared to only 20 percent of the incidents on other types of main.

Since 2001, Pennsylvania's NGDCs have experienced 10 corrosion-related incidents on both its cast iron and steel mains. Despite the fact that corrosion-related incidents are equal, as noted in Table 4 below, there is significantly more unprotected steel pipe in Pennsylvania than cast iron. As a result, cast iron has a higher risk of corrosion-related incidents.

²⁴ Incident means any of the following events:

- (1) An event that involves a release of gas from a pipeline, or of liquefied natural gas, liquefied petroleum gas, refrigerant gas or gas from an LNG facility, and that results in one or more of the following consequences:
 - (i) A death, or personal injury necessitating in-patient hospitalization;
 - (ii) Estimated property damage of \$50,000 or more, including loss to the operator and others, or both, but excluding cost of gas lost;
 - (iii) Unintentional estimated gas loss of 3 million cubic feet or more;
- (2) An event that results in an emergency shutdown of an LNG facility. Activation of an emergency shutdown system for reasons other than an actual emergency does not constitute an incident.
- (3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraphs 1 or 2 of this definition. 49 C.F.R §191.3

Table 4: Cast Iron Incidents vs. Unprotected Steel Incidents in PA

Year	Total Incidents	Total Corrosion Incidents	% of Total Corrosion Incidents	Steel Incidents 2001 to Present	% Steel Incidents	Cast Incidents 2001 to Present	% Cast Incidents	Total Miles of Cast	Total Miles of Steel
2001	6	1	17%	1	100%	0	0%	N/A	N/A
2002	7	1	14%	1	100%	0	0%	3,483	11,326
2003	10	2	20%	0	0%	2	100%	3,431	10,967
2004	19	2	11%	2	100%	0	0%	3,365	10,856
2005	8	1	13%	1	100%	0	0%	3,313	10,444
2006	8	2	25%	2	100%	0	0%	3,265	10,312
2007	6	1	17%	0	0%	1	100%	3,295	9,844
2008	5	2	40%	1	50%	1	50%	3,243	9,625
2009	4	2	50%	1	50%	1	50%	3,199	9,359
2010	1	0	0%	0	0%	0	0%	3,140	9,146
2011	5	2	40%	0	0%	2	100%	3,235	8,857
2012	1	0	0%	0	0%	0	0%	3,196	8,816
2013	3	1	33%	0	0%	1	100%	3,091	8,471
2014	5	2	40%	1	50%	1	50%	N/A	N/A
2015	1	1	100%	0	0%	1	100%	N/A	N/A
Total	89	20		10		10			

Additionally, Table 4 above demonstrates that more corrosion incidents in Pennsylvania have occurred on cast iron mains in recent years. Tables 5 and 6 show that cast iron incidents in Pennsylvania as a percentage of corrosion incidents have been trending upward since 2001, while unprotected steel incidents have been trending downward.

Table 5: Total Steel Incidents in PA 2001 to Present

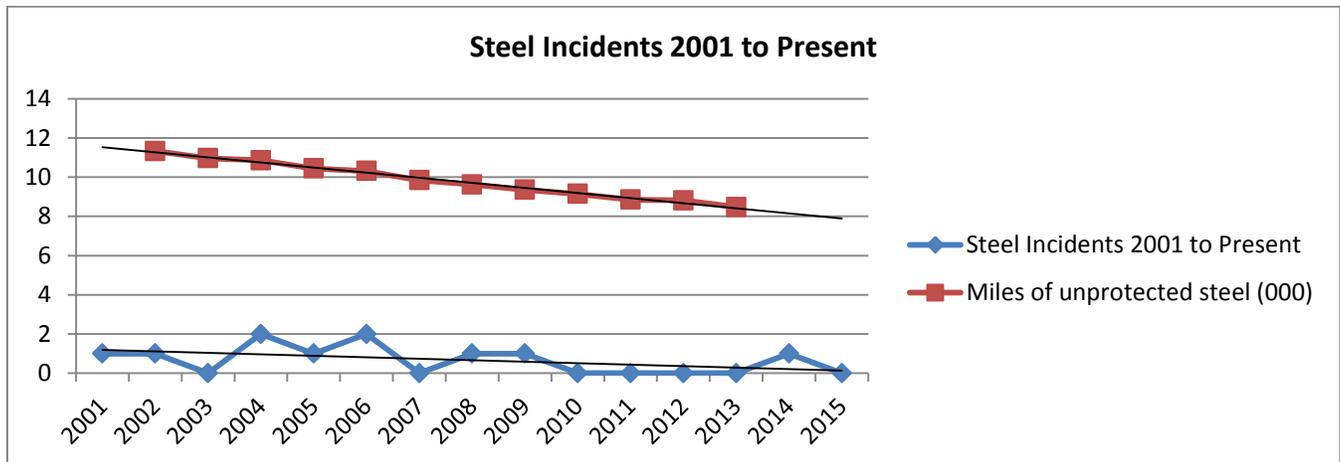
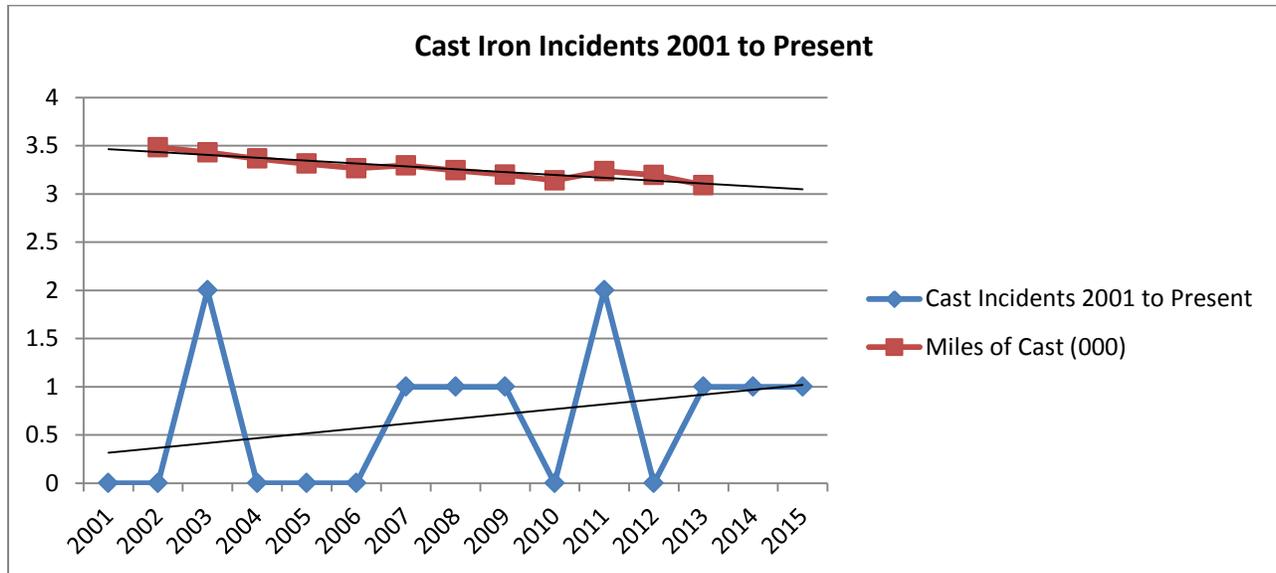


Table 6: Total Cast Iron Incidents in PA 2001 to Present



Staff recognizes that operating pressure on the distribution system is also a component of pipeline risk. Although PGW’s distribution system is comprised of a combination of pressures and materials, approximately 77 percent of its system operates at low pressure, or less than 1 pound per square inch gauge (psig). The fact that PGW’s system operates at low pressure does not mean that this pipe is safe. Just the opposite is true in PGW’s main replacement program. The program is driven by a risk analysis of the piping system, primarily focuses on small-diameter cast iron (8” and under) operating at low pressure (4.5-14” water column pressure (WC)). Additionally, in 2014, PGW abandoned or removed from service nearly 22 miles of small-diameter, low-pressure (4.5-14” WC) cast iron of the total 28 miles of cast iron removed.²⁵ The combination of leak or break likelihood and consequence of these failures in densely populated areas, along with other factors, drives these main replacements for PGW. Therefore, despite the fact that PGW’s distribution system operates at low pressure, PGW has determined that its low-pressure cast iron pipe is its riskiest and has focused its efforts on removing and abandoning this pipe.

FINANCIAL AND HUMAN CONSEQUENCE OF PIPELINE FAILURE

The consequence of pipeline failure can be catastrophic. In 2011, a PGW employee died when natural gas migrating from a ruptured cast iron underground main came into contact with an ignition source in the basement of a residence.

²⁵ PL-6.

Several other people also were injured. An investigation found a circumferential break²⁶ on a 12-inch cast iron distribution main that was installed in 1942 and was operating at 17 psig.

Following this incident, PHMSA issued an advisory bulletin to owners and operators of natural gas cast iron distribution pipelines and state pipeline safety representatives. In its March 23, 2012, bulletin, specifically referencing this PGW incident, PHMSA urged natural gas system owners and operators to conduct a comprehensive review of cast iron distribution pipelines and replacement programs and accelerate pipeline repair, rehabilitation and replacement of high-risk pipelines.

From 2005 to present, PGW reported the following incidents on its distribution system:

Table 7: Incidents on PGW's System 2005-2015

Date	Street	Deaths	Injuries	Evacuated	Property Damage	Explosion	Pipe Material	Year Installed	Pipe Pressure
2/16/2015	7912-7914 Ardleigh St.	0	0	10	\$285,816	Yes	Cast Iron	1906	Low ²⁷ (4.5-14" WC)
1/30/2014	1849 S. Bancroft St.	0	1	0	\$375,516	Yes	Cast Iron	1939	Low (4.5-14" WC)
1/18/2011	6932 Torresdale Ave.	1	3	30	\$372,850	Yes	Cast Iron	1942	High ²⁸ (10-35 psig)
2/7/2008	709 S. 6 th St.	0	0	10	\$925,000	Yes	Cast Iron	1922	Low (4.5-14" WC)

LEAKS

Leaks in cast iron pipes are most often caused by digging or by naturally occurring phenomena. Earth movement is the biggest cause of leaks in cast iron pipes. These leaks can occur when the pipes are disturbed by digging, seasonal frost heave or changes in groundwater levels. Graphitization also is a serious threat to cast iron pipes. Graphitization is a natural process during which iron degrades to brittle elements, making iron pipelines more susceptible to cracking. Gas may leak from the joints or through cracks in the pipe if graphitization has occurred.

²⁶ Circumferential: Pertaining to the circumference; encompassing; encircling; circuitous.

²⁷ This low-pressure designation applies to PGW's distribution network.

²⁸ This high-pressure designation applies to PGW's distribution network.

Leaks are classified by PHMSA as either hazardous or non-hazardous. Leak classification is determined by the pipeline operator and is based on experience and/or industry practices. Typically, a leak is classified based on an evaluation of the location and/or extent of a leak. Leaks and repair prioritization are determined by a ranking system, such as class or grade A, B, C or 1, 2, 3. The following leak grades/classes are commonly used, thereby establishing the leak repair priority:

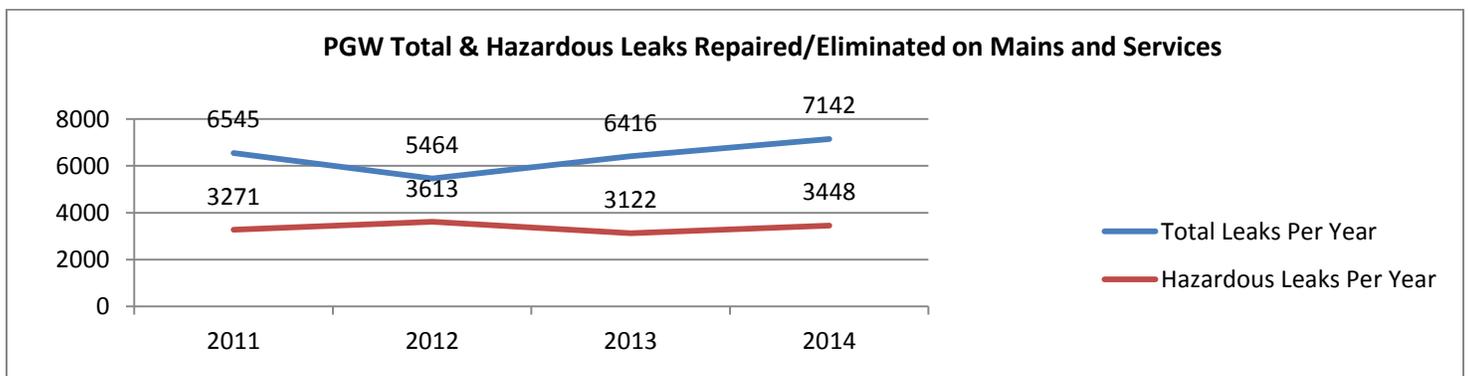
Grade 1: A leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous. For example, a leak that is at a building wall or inside a building is a Grade 1 Leak.

Grade 2: A leak that is recognized as being non-hazardous at the time of detection, but requires scheduled repair based on probability of future hazard, such as a leak under frozen or adverse soil conditions that would likely cause migration to the outside wall of a building.

Grade 3: A leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous. For example, a leak under a street in areas without wall-to-wall paving where it is unlikely the gas could migrate to the outside of a building.

PGW discovered a total of 6,256 leaks (Grades 1-3) in 2013 and a total of 7,646 leaks (Grades 1-3) in 2014.²⁹ Additionally, the number of leaks PGW has repaired/eliminated has been increasing since 2012.³⁰ As shown on Table 8 below, PGW had 5,464 total leaks (Grades 1-3) on its mains and services that were repaired/eliminated in 2012. Over the past three years, the Company’s number of total leaks has steadily increased, resulting in 7,142 total leaks (Grades 1-3) repaired/eliminated in 2014.

Table 8: PGW Total and Hazardous Leaks Repaired/Eliminated on Mains and Services

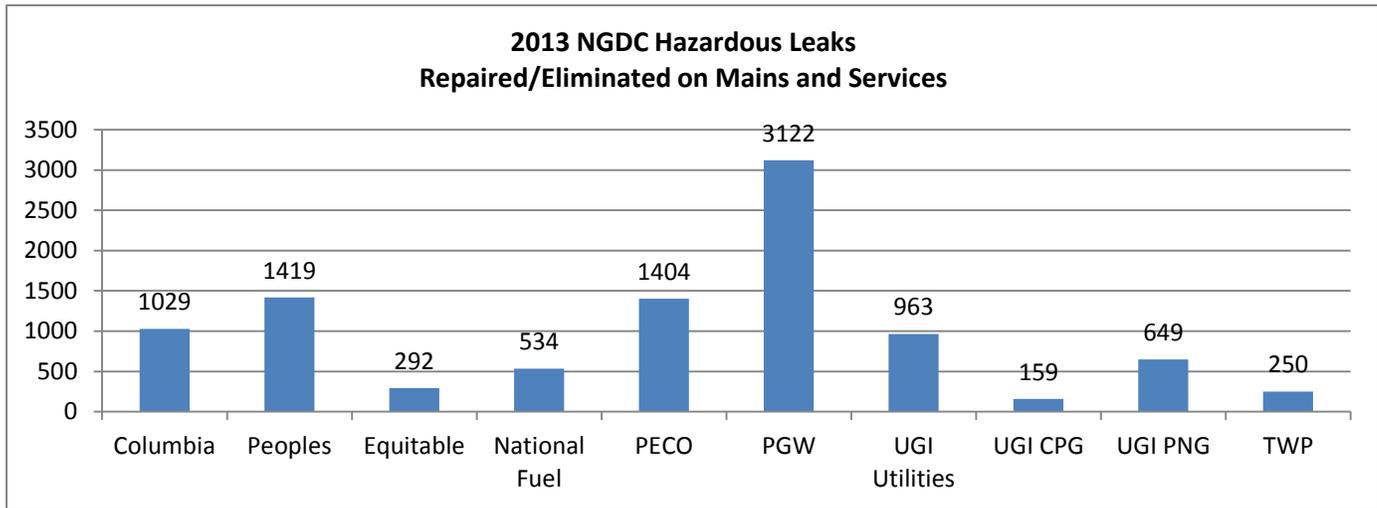


²⁹ PL-34.

³⁰ The number of repaired/eliminated leaks in a given year can exceed the number of leaks discovered in that year because some leaks are carried forward from year to year.

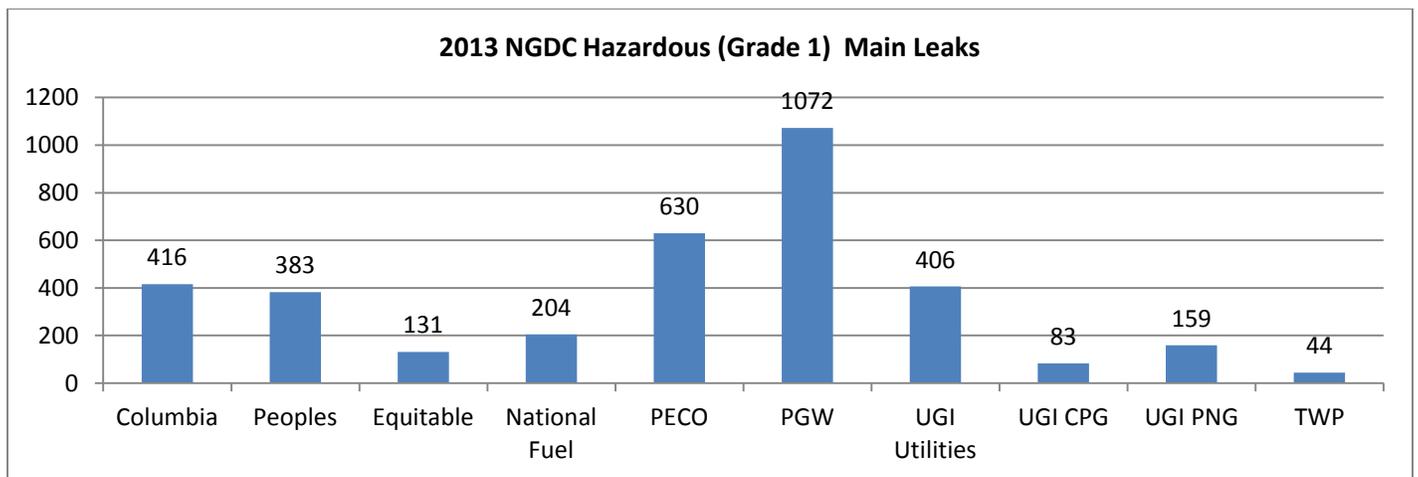
Additionally, PGW's 3,122 hazardous leaks (Grade 1) that were repaired/eliminated on its mains and services in 2013 is approximately double the number of hazardous leaks of any other large Pennsylvania NGDC that year. Table 9 demonstrates that the state average of hazardous leaks on mains and services in 2013, excluding PGW's statistics, was approximately 744. Staff does not yet have the 2014 total and hazardous leak data for other large NGDCs; however, it is expected that PGW will continue to have significantly more leaks than its peer NGDCs.

Table 9: 2013 NGDC Hazardous Leaks Repaired/Eliminated on Mains and Services³¹



Of the 3,122 hazardous leaks reported by PGW on its mains and services in 2013, 1,072 were main leaks. Table 10 shows that, excluding PGW data, other large NGDCs reported an average of approximately 273 hazardous main leaks in 2013, which is significantly fewer than PGW's hazardous main leaks.

Table 10: 2013 NGDC Hazardous Main Leaks³²



³¹ 2013 DOT Annual Report.

³² 2013 DOT Annual Report.

As shown in Table 11, PGW repaired/eliminated 2.12 main and service leaks per mile of main in 2013. Table 12 demonstrates that PGW's 2.12 total leaks (Grades 1-3) repaired/eliminated is significantly higher than the state average of main and service leaks repaired/eliminated per mile, which is 0.66 (0.5, excluding PGW data).

Table 11: PGW Total and Hazardous Leaks Repaired/Eliminated per Mile

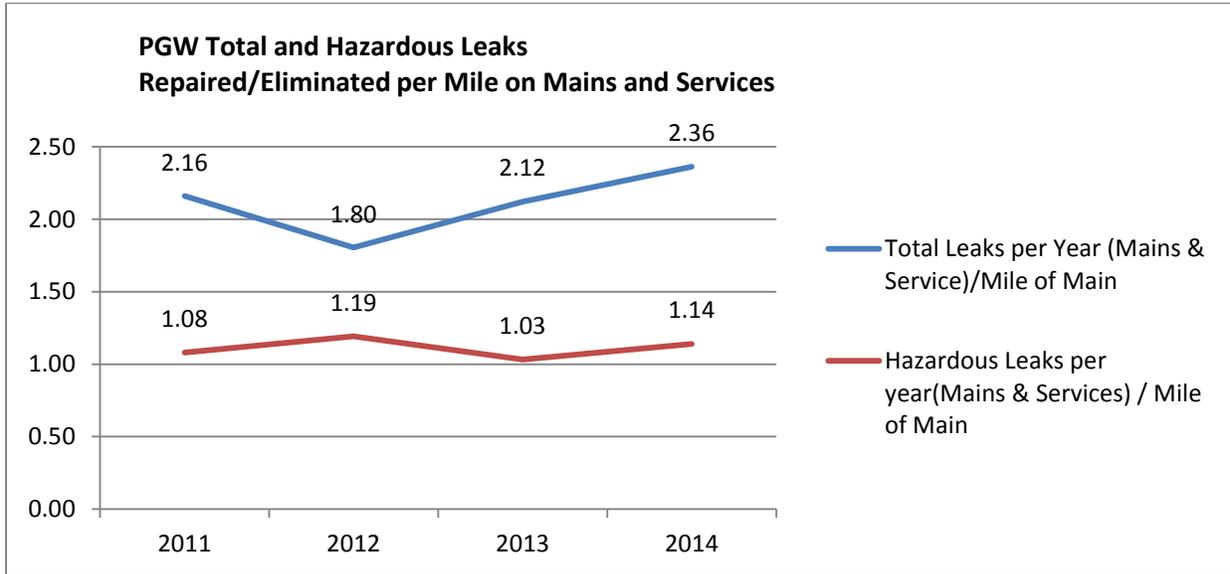
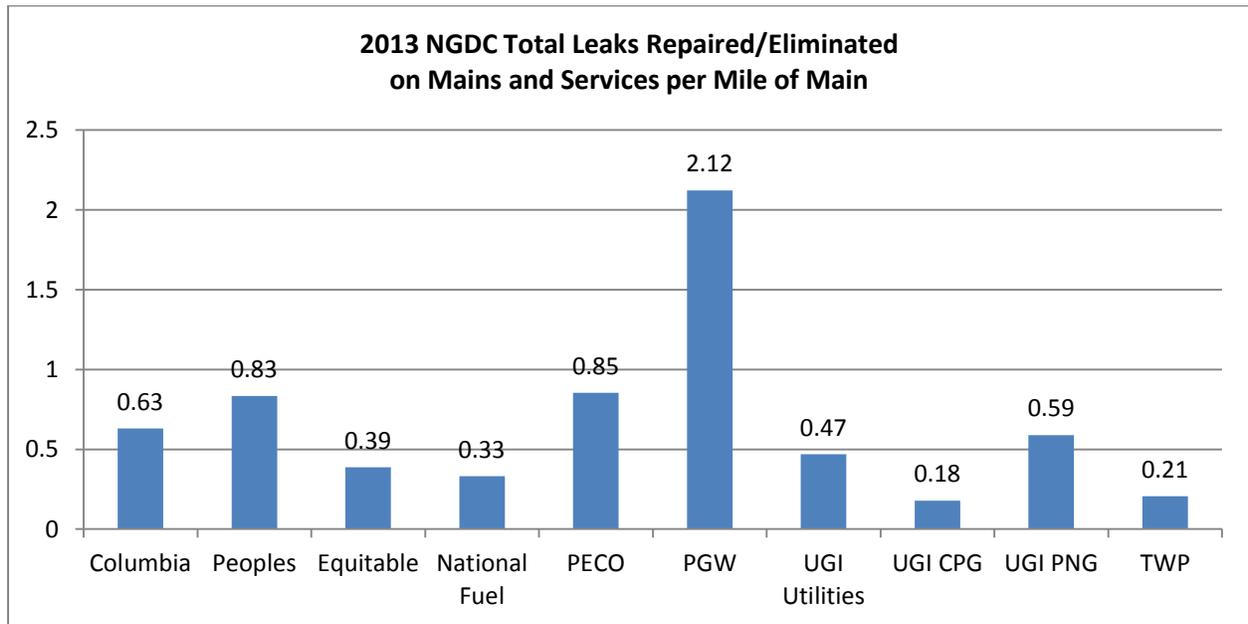


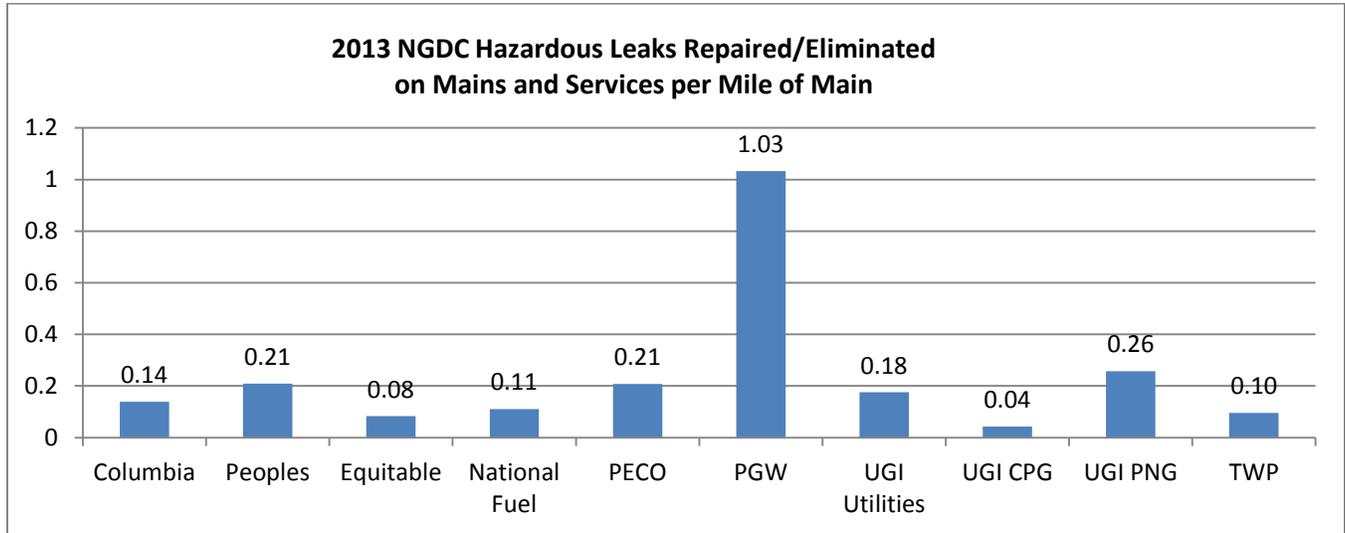
Table 12: 2013 NGDC Total Leaks Repaired/Eliminated on Mains and Services³³



³³ 2013 DOT Annual Report.

Additionally, with respect to hazardous leaks, Table 11, shown previously, shows that PGW repaired/eliminated 1.03 hazardous leaks (Grade 1) on its mains and services per mile of main in 2013. PGW's 1.03 hazardous leak rate far exceeds the 0.24 state average of hazardous service and main leaks per mile as illustrated in Table 13.

Table 13: 2013 NGDC Hazardous Leaks Repaired/Eliminated on Mains and Services³⁴



Leaks can be found through normal leak surveys, frost patrols/advanced frost patrols or by customer reports. Of PGW's total 6,256 leaks discovered in 2013, only 348, or 5.6 percent, were found through normal leak surveys. PGW finds relatively few leaks from leak surveys and relies on odor complaints by customers and emergency notifications to report leak locations.

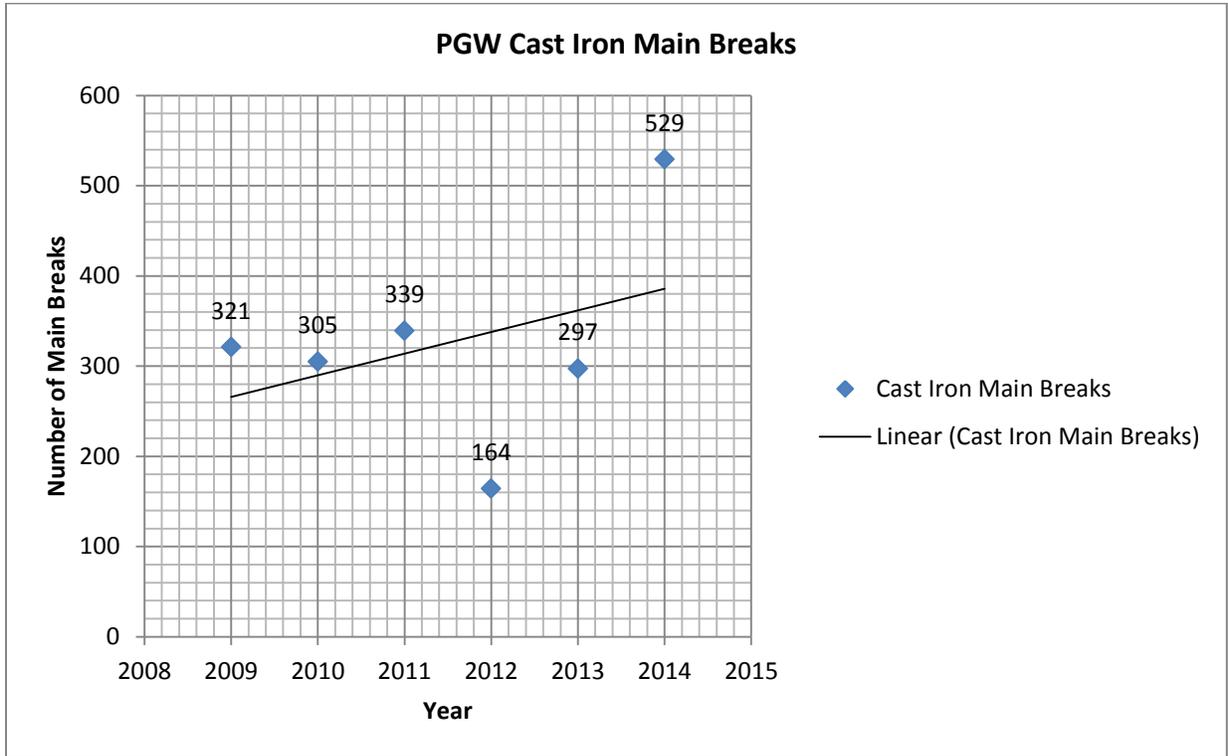
BREAKS

As shown in Table 14, PGW's recorded cast iron main breaks have increased. In 2010, PGW had 305 cast iron main breaks. In 2014, the number of cast iron main breaks increased to 529. Staff recognizes that this increase in 2014 is likely due to normal graphitization and colder-than-normal weather temperatures; however, PGW may continue to experience above-average breaks on its cast iron mains if similarly cold winters occur in the future.

Cast iron main breaks are especially problematic because this type of pipe often breaks catastrophically. Cast iron main failures often occur suddenly and are accompanied by the release of relatively large amounts of gas from a circumferential failure. These cast iron main breaks most often occur beneath paved surfaces or below the frost line, where escaping gas is unable to vent to the atmosphere and continues to build up below ground until it finds an escape path of least resistance (sewer, electric conduit, water line, etc.). The gas then travels along these paths and enters basements, crawl spaces and foundations, where the gas can be ignited.

³⁴ 2013 DOT Annual Report.

Table 14: PGW Cast Iron Main Breaks 2008-2014³⁵



INSIDE METER SETS AND STEEL SERVICES

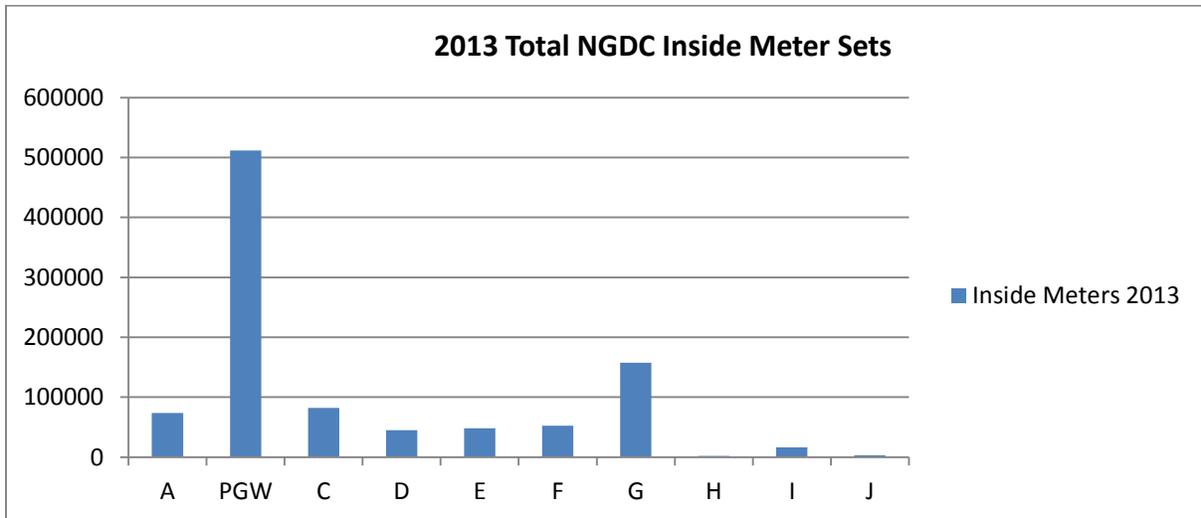
Also of concern to the Staff, and worth noting, is the high number of inside meters in operation. New services traditionally have outdoor meter sets located on exterior walls to ensure that they are readily accessible and are designed for the safe relief of excess gas pressure under emergency conditions. Meter sets that are located inside a dwelling are risky because of the possibility of gas flowing into a structure if the meter is detached from the service line. The degree of risk is increased when these inside meters are connected to a steel service line, because steel service lines are susceptible to pulling away from the house or meter due to excavation equipment coming into contact with the service line, which could cause a gas rupture indoors. Moreover, the risk is further increased when the inside meter is connected to a bare steel service line, as those lines are more subject to corrosion.

In addition, inside meter sets are a barrier to compliance with federal and state regulations pertaining to leak surveys because of limited access. Under federal rules, utilities are required to test the integrity of their distribution systems up to the gas meter. However, utilities cannot perform leak tests on indoor meters if they do not have access to the devices. As a result, the gas utility is unable to assess the risk associated with these meters.

³⁵ PL-31(d).

As of 2013, PGW had 511,410 inside meter sets. This greatly surpasses the state average of 53,317 inside meter sets (excluding PGW data) as shown in Tables 15 and 16.

Table 15: 2013 Total NGDC Inside Meter Sets³⁶



Moreover, as shown in Table 16, 145,753 of PGW's 511,410 inside meter sets were connected to steel service lines in 2013.

Table 16: 2013 Total NGDC Inside Meter Sets with Steel Service Lines³⁷

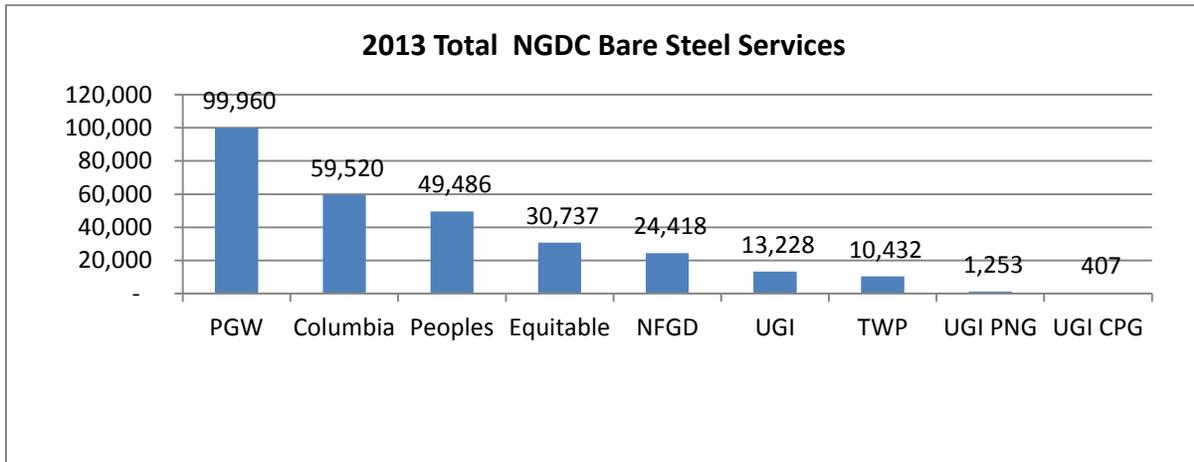
Company	Inside Meter Sets	With Steel Service Lines
A	81,863	0
B	44,997	0
C	47,864	22,240
D	52,514	21,317
E	73,650	28,716
PGW	511,410	145,753
G	157,662	6,037
H	16,429	4,356
I	2,853	269
J	2,019	0

³⁶ FL-1-14.

³⁷ FL-1-14.

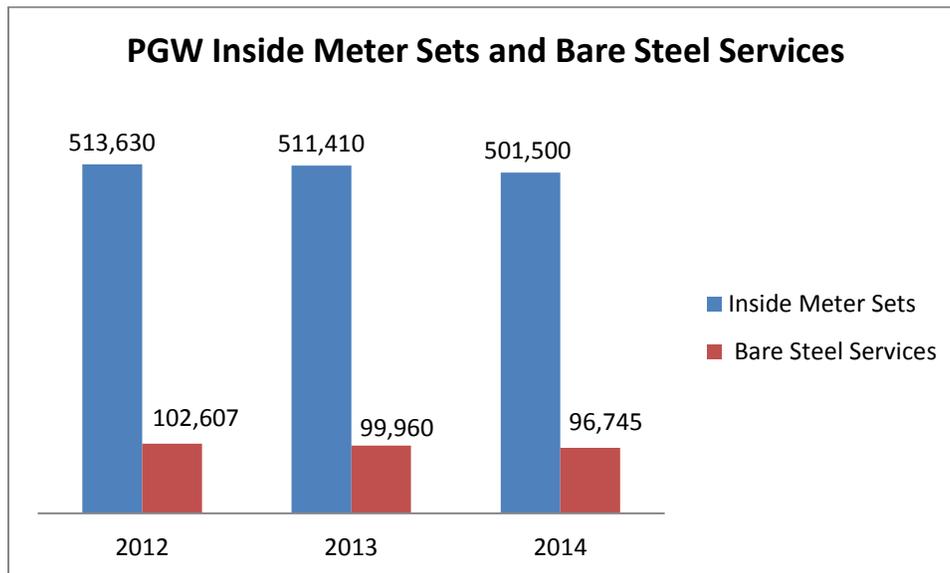
Table 17 demonstrates that PGW has more bare steel service lines than any other NGDC.

Table 17: 2013 Total Bare Steel Services³⁸



PGW is gradually decreasing its number of inside meter sets and replacing approximately 3,000 bare steel services per year through main replacements and service upgrades, due to leaks or other excavation purposes. Table 18 shows that, in 2014, PGW's inside meter sets decreased to 501,500, of which approximately 97,000 were connected to bare steel service lines.

Table 18: PGW Inside Meter Sets and Bare Steel Services 2012-2014³⁹



³⁸ 2013 DOT Annual Report and PL-29. PGW will amend 2013 DOT Annual Report to 99,960 bare steel services in 2013.

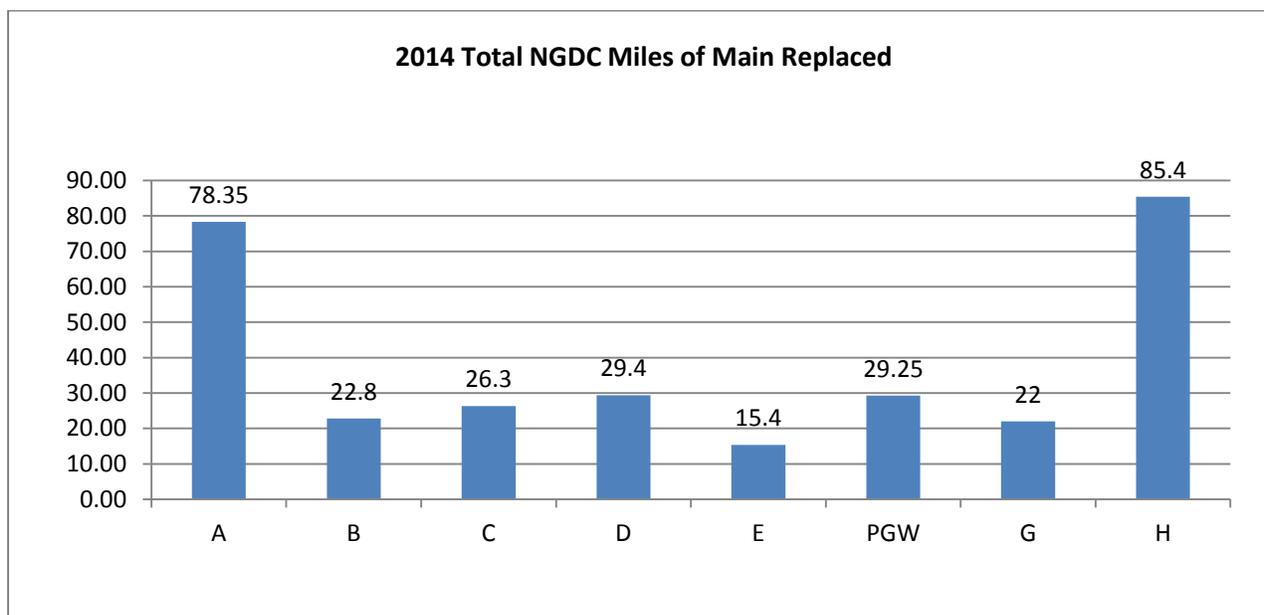
³⁹ PL-10 and PL-29.

IV. BENCHMARKING PGW'S CURRENT PIPELINE REPLACEMENT RATE

MILES REPLACED AND ABANDONED

In 2000, as a condition of obtaining \$11 million in interim rate relief, the PUC ordered that "PGW must achieve a 1-percent replacement rate in its mains replacements program, as provided for in the Company's base case capital budget."⁴⁰ From 2001-2012, PGW replaced or abandoned an average of 18.3 miles per year of cast iron main. From 2011-2013, PGW replaced approximately 20 miles of cast iron main per year. The PUC's Gas Safety Division sends data requests annually to large NGDCs to determine how many miles of main have been replaced. While not all large NGDCs have responded to the 2015 data request, the preliminary findings from the reporting entities, as summarized in Table 19, show that PGW replaced approximately 29 miles in 2014.

Table 19: 2014 Total Miles of Main Replaced⁴¹

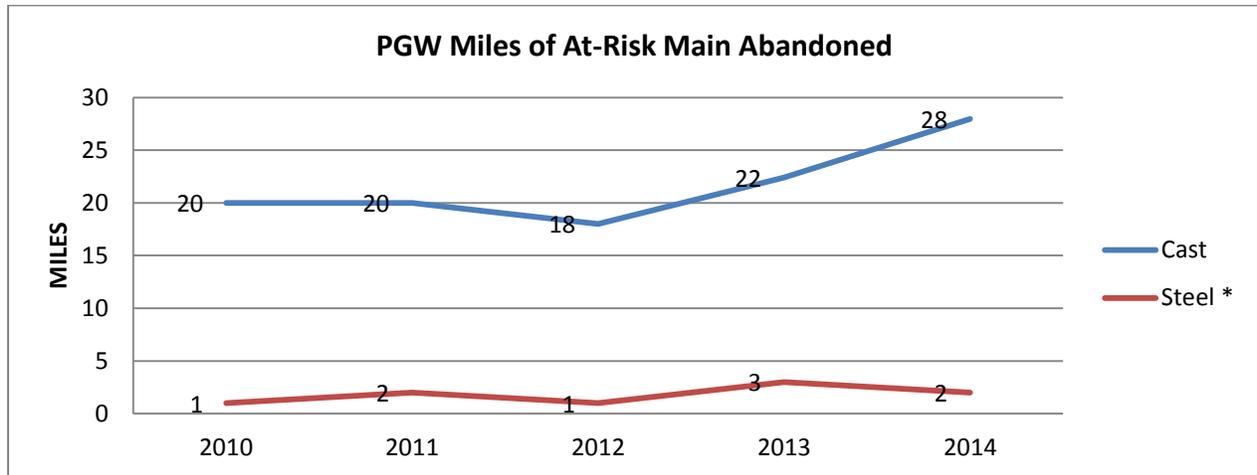


In 2013, PGW abandoned 28.15 miles of main, comprised of 22.44 miles of cast iron and 1.5 miles of unprotected coated steel mains.

⁴⁰ *Pa. PUC v. PGW*, Docket No. R-00005654, pp. 27-29, 33 (Order entered Nov. 22, 2000).

⁴¹ FL-1-15.

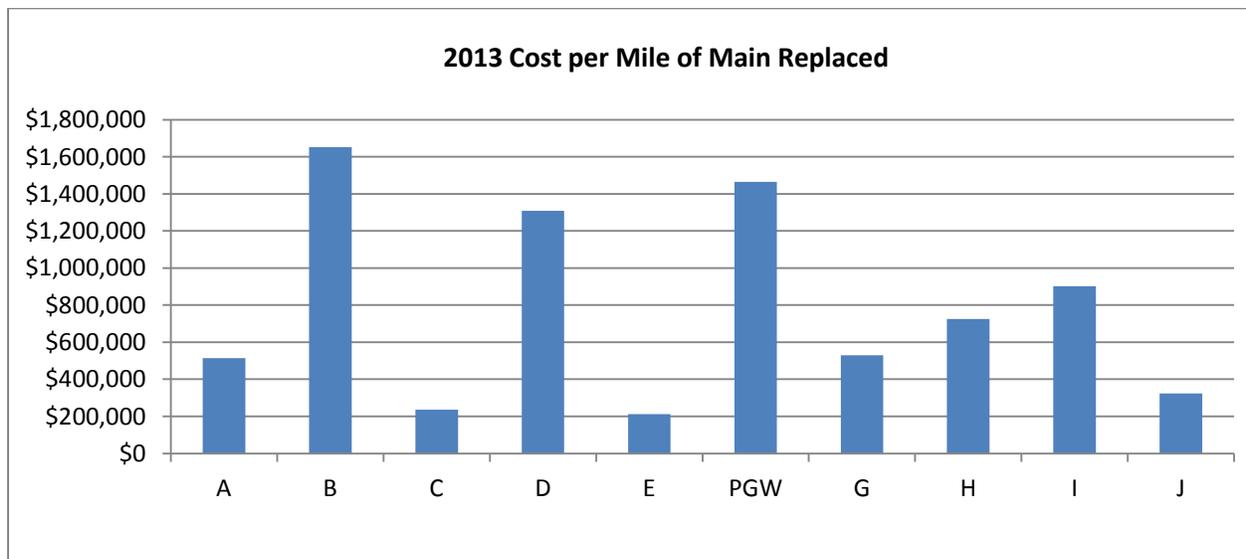
Table 20: PGW Miles of At-Risk Main Abandoned



COST OF CURRENT REPLACEMENT PROGRAM

PGW's cost per mile to replace mains is among the highest in the Commonwealth. This replacement cost is in large part due to the fact that PGW's service territory is a densely populated, urban setting and that its distribution system is typically located under pavement in high-traffic areas, and in close proximity to buildings and residences. In 2013, PGW's replacement cost per mile was \$1,464,734, while the statewide average was \$753,713.

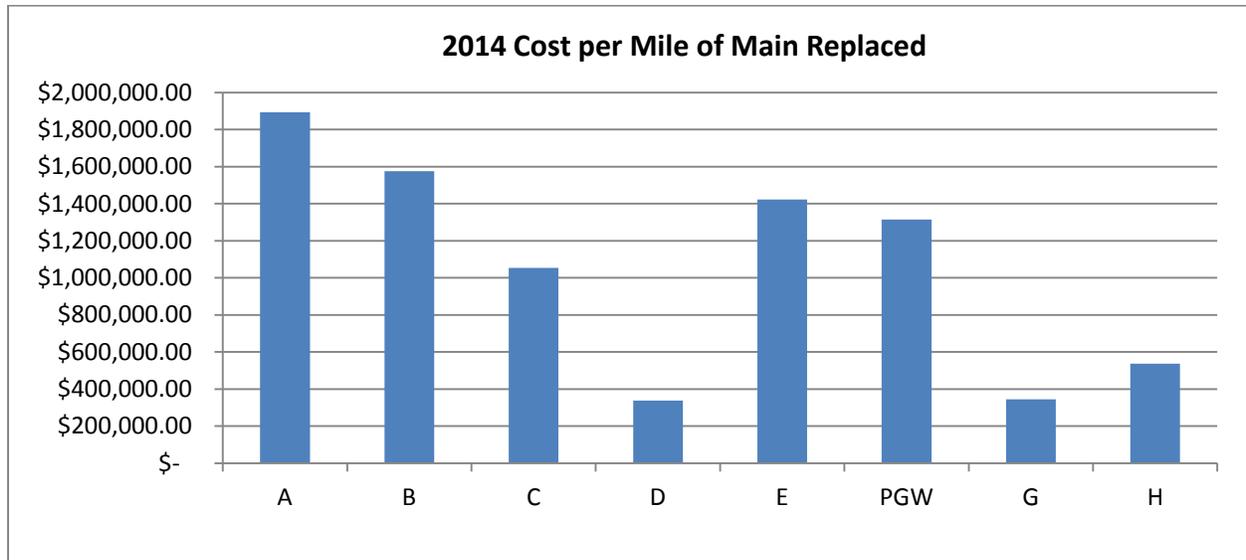
Table 21: 2013 Cost per Mile of Main Replaced⁴²



⁴² FL-1-14.

Table 22 shows that PGW’s main replacement cost per mile decreased from its 2013 level to \$1,314,051 in Fiscal Year 2014. Despite this decrease, PGW’s replacement cost exceeds the statewide average of \$1,059,323.

Table 22: 2014 Cost per Mile of Main Replaced⁴³



EXPECTED END DATE

According to PHMSA, Pennsylvania, with 3,115 miles of cast iron in 2013, currently has the fourth-highest amount of cast iron mains nationwide. Approximately half of the cast iron main in the Commonwealth is located on PGW’s system.

According to data filed in PGW’s 2013 DOT annual report, the Company removed 22.5 miles of cast iron from service, resulting in a year-ending balance of 1,501 miles of cast iron main. At PGW’s 2013 replacement rate, it would take approximately 67 years to remove all cast iron mains. PGW also removed three miles of its 493 miles of unprotected coated steel. Accordingly, it would take approximately 78 years to remove the 1,994 miles of at-risk main comprised of cast iron and unprotected steel.

PGW accelerated its replacement rate in 2014 when it removed approximately 28 miles of cast iron, resulting in a year-ending cast iron balance of 1,473 miles. PGW’s 2014 replacement rate, if sustained, would reduce its cast iron removal from 67 years in 2013 to approximately 52.5 years. PGW also removed two miles of unprotected coated steel in 2014, resulting in a year-ending unprotected steel balance of 491 miles. Based on its 2014 replacement rate, it would take approximately 65.5 years to remove all 1,964 miles of at-risk pipe (both cast iron and unprotected steel).

⁴³ FL-1-15.

Although PGW’s 52.5-year cast iron replacement rate in 2014 is a decrease from the 67 years reported in 2013, its cast iron replacement rate is significantly longer than any NGDC in the Commonwealth. As shown in Table 23, most NGDCs plan to replace cast iron in 13 to 22 years; however, PGW’s Long Term Infrastructure Improvement Plan (LTIIIP) filed with the Commission, at Docket No. P-2012-2337737, shows an 88-year replacement rate.

Table 23: NGDC Cast Iron Replacement Rate

Company	LTIIIP Period	Schedule of Completion
Columbia	2013-2017	Replace all cast iron and bare steel in 17 years.
Peoples	2015-2019	Replace all "target" pipe within 20 years. Separately filed plan details a 15-year timeline to eliminate all cast iron in the system.
Peoples TWP	2013-2017	Replace all "target" pipe within 20 years.
PGW	Fiscal Year 2013-2017	Plans to eliminate all cast iron pipeline in 88 years.
NFG	N/A	No LTIIIP filed.
PECO	2013-2022	Replace all cast iron and bare steel mains and services in 22 years.
UGI	2014-2018	Replace all cast iron in 13 years and all bare steel and wrought iron in 28 years.

Below is a summary of PGW’s cast iron and total at-risk main replacement rates, based on its actual replacement rate in 2013 and 2014 and its LTIIIP:

Table 24: Summary of PGW’s Replacement Rate

Year	Cast Iron	Total At-Risk Pipe	LTIIIP (Cast iron only)
2013	67 years	78 years	88 years
2014	52.5 years	66 years	87 years

Recently, Public Service Electric & Gas Co. (PSE&G), whose distribution system contains the most cast iron mains of any utility in the nation at 4,051 miles and contains 279 miles of bare steel mains, requested New Jersey regulators to approve \$1.6 billion over the next five years to remove approximately 800 miles of at-risk pipe from its distribution system. If approved, PSE&G will triple its annual pipeline replacement from 54 miles of high risk pipe to 160 miles. PSE&G estimates that this proposal would increase rates approximately 2 percent a year, causing the average residential monthly gas bill to increase \$0.14 in the first year and by \$8.60 per month at the end of the five-year period. While PSE&G is currently planning to remove 800 miles, if it continues this aggressive replacement program beyond the contemplated five-year period, all of its cast iron and bare steel pipe would be removed in 27 years, rather than its current 80-year replacement rate.

This type of aggressive infrastructure replacement is encouraged by federal pipeline regulators. In 2011, following major, tragic natural gas incidents across the nation, DOT and PHMSA issued a Call to Action to accelerate the repair, rehabilitation and replacement of the highest-risk pipeline infrastructure. Those entities noted that pipelines constructed of cast iron and bare steel are among those that pose the highest risk. According to PHMSA, 16 states have completely eliminated cast or wrought iron natural gas distribution lines within their borders: Alaska, Arizona, Hawaii, Idaho, Montana, North Carolina, North Dakota, New Mexico, Nevada, Oklahoma, Oregon, South Carolina, Utah, Vermont, Wisconsin and Wyoming. In contrast, Pennsylvania's cast iron mains will not be eliminated for another 52.5 years, or until 2066, at PGW's 2014 replacement rate.

SUMMARY

Across Pennsylvania, NGDCs are developing aggressive strategies to remove unprotected steel and cast iron from service in order to reduce system risk, enhance safety and reinforce system reliability. PGW should implement a similarly aggressive main-replacement strategy given the information presented in this report with respect to the Company's total leaks, hazardous leaks, main breaks, miles of cast iron, miles of unprotected steel, age of mains, number of inside meter sets, bare steel services and main replacement rate forecasts. The highlights are summarized below:

- *In 2013, PGW had approximately 3,024 miles of gas main, comprised of 1,501 miles of cast iron pipeline and 493 miles of unprotected steel. Therefore, 66 percent of PGW's distribution system is comprised of at-risk main.*
- *PGW has more than double the miles of cast iron than any other NGDC and its system accounts for approximately half of the total cast iron mains in Pennsylvania.*
- *PGW's gas mains are some of the oldest in the state, with more than 1,170 miles installed pre-1940.*
- *PGW discovered more than 6,200 leaks in 2013 and more than 7,600 leaks in 2014.*
- *PGW had a total of 3,122 hazardous leaks on its mains and services in 2013, which is more than double any other NGDC. PGW's total hazardous leaks increased to 3,448 in 2014.*
- *Of the total 3,122 hazardous leaks in 2013, Table 10 shows that 1,072 were hazardous main leaks. The other large NGDCs had an average of 273 hazardous main leaks; therefore, PGW had nearly four times*

the state average of hazardous main leaks for the other NGDCs in 2013.

- *From 2013 to 2014, PGW experienced a 78-percent increase in cast iron main breaks from approximately 297 cast iron main breaks in 2013 to 529 in 2014.*
- *PGW relies on customer calls and emergency notifications to report leaks: in 2014, approximately 84.5 percent of PGW's leaks were found through customer and emergency notifications, while the remaining 15.5 percent were found through leak surveys.*
- *In 2013, PGW had 511,410 inside meter sets, which surpasses the 53,317 inside meter set average of other large NGDCs (excluding PGW data).*
- *Approximately 99,960 of PGW's inside meter sets had bare steel services in 2013. PGW has the highest number of bare steel services in the state.*

The facts above highlight the challenges facing the current PGW distribution system serving Philadelphia. Removal of at-risk pipe is important, considering that PGW provides service in an urban environment with high population density and a vast amount of paved ground cover, which can lead to gas leaks migrating to buildings and potentially catastrophic results. While other NGDCs in the Commonwealth plan to remove cast iron pipe in 13 to 22 years, PGW's LTIIP indicates an 88-year replacement rate with its actual 2014 cast iron replacement on pace for 52.5 years. Although PGW increased its rate of main replacement in 2014, its replacement period is still more than twice the rest of the Pennsylvania NGDCs. The other large NGDCs are replacing at-risk pipe in an aggressive time period, and PGW should be no different. Staff maintains that safety should not be compromised; therefore, PGW's objective should be to strive to replace its at-risk pipe at a rate closer to the average rate of the other Pennsylvania NGDCs.

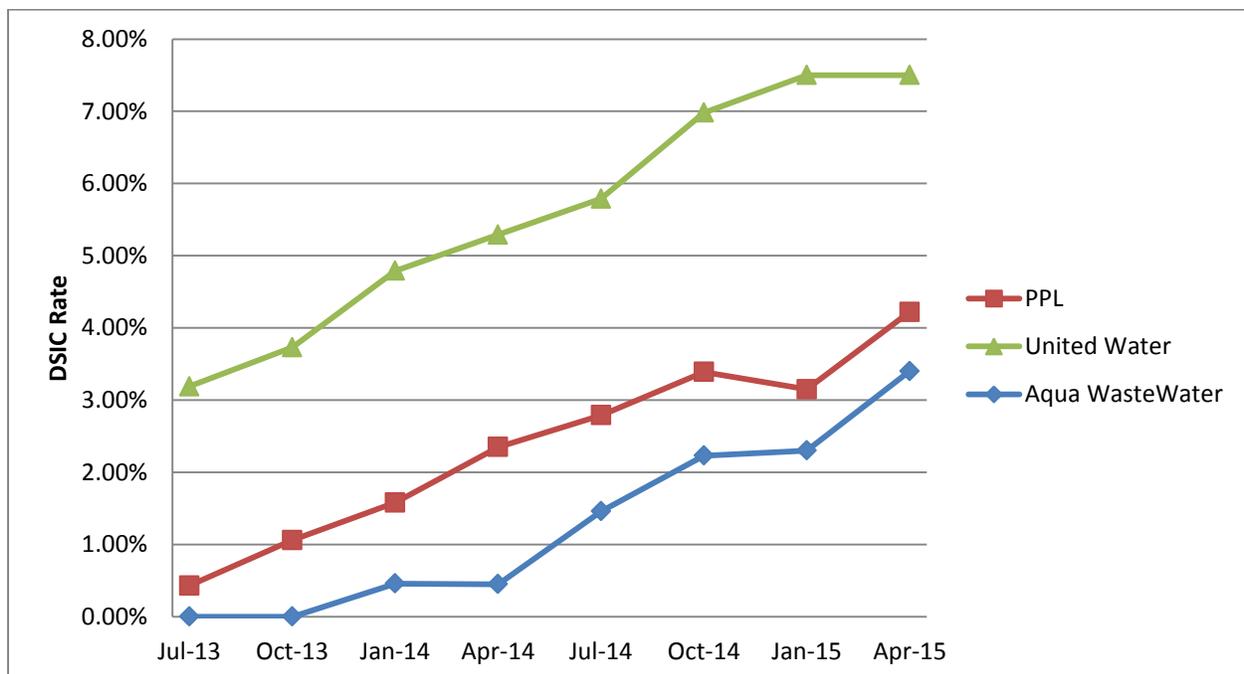
V. OPPORTUNITIES TO ACCELERATE PIPELINE REPLACEMENT

Opportunity 1 – Increase DSIC Above the Current 5-Percent Cap

The DSIC has been in use for approximately 20 years as a means to recover certain eligible expenditures related to infrastructure improvements. It was originally designed to aid water utilities in accelerating recovery of infrastructure improvement costs between base rate cases. The DSIC used by investor-owned utilities allows utilities to begin to recover the fixed cost of qualifying capital improvements once they are placed in service and, therefore, delay the need to file the next base rate case. As a consumer protection, improvements must exceed the level reflected in the company’s rate base revenues (as defined in the test year of its last base rate case) before costs are allowed to be passed through the DSIC mechanism. The DSIC mechanism is also capped at a set percentage of distribution revenue, putting a limit on the amount of infrastructure improvements that can be funded through the DSIC mechanism before a base rate case must be filed. However, all DSIC-eligible property is added to rate base revenue calculations once a new base rate case is submitted and approved, which also resets the DSIC to zero.

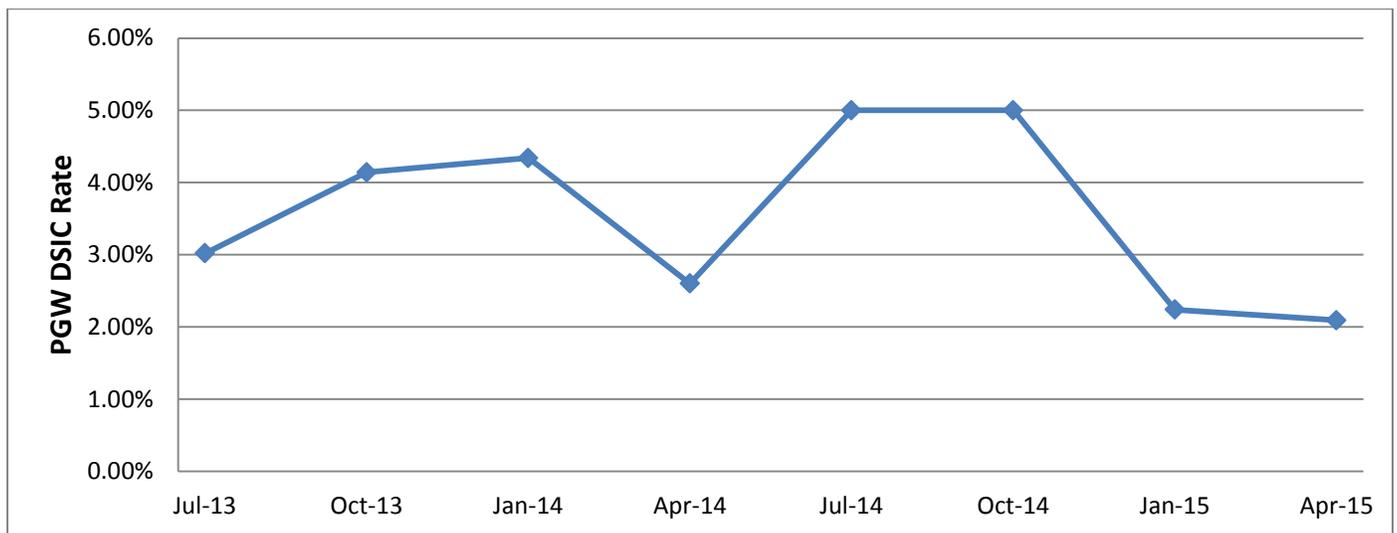
As shown in Table 25, rates for the DSIC mechanism utilized by non-NGDC, investor-owned utilities are steadily increasing over time, reflecting recovery of increasing amounts of “depreciation of” and “rate of return on” eligible property.

Table 25: Sample Standard DSIC Rates July 2013-April 2015



However, PGW’s DSIC is substantially different than used by the investor-owned utilities, as described above. In PGW’s case, its DSIC is designed to fully recover actual eligible expenditures of the past quarter in a subsequent quarter. As a result, PGW’s DSIC rate (percentage of distribution revenue recovered via the DSIC) fluctuates higher or lower based on the quarterly amount of eligible property expenditures completed, which vary due to conditions such as seasonal construction conditions, quarterly revenues, etc., as shown in Table 26. PGW’s cash-flow DSIC is not designed to recover depreciation expense and rate of return on eligible expenditures like an investor-owned utility, since a rate of return/rate base is not a component of PGW’s base rates. However, as with all DSIC mechanisms, PGW’s revenue recovery is limited to expenditures for projects actually completed and placed in service. Additionally, the types of recoverable costs for PGW could include financing costs for DSIC-eligible property including debt service, debt service coverage and issuance costs.⁴⁴

Table 26: PGW Effective DSIC Rates July 2013-April 2015



As a consumer safeguard, all NGDCs’ DSIC rates, including PGW’s, are currently capped at 5 percent of distribution revenues.⁴⁵ The Company’s current LTIP, at Docket No. P-2012-2337737, states that it will place into service approximately \$22 million in DSIC-eligible property annually during the five-year plan. The \$22 million is near to the maximum annual amount permitted under the 5-percent cap, calculated based on distribution revenue from PGW’s most recent base rate case, at Docket No. R-2009-2139884.

An option to provide additional revenue for main replacement through the DSIC mechanism is to raise the DSIC rate cap from 5 percent to some higher level. Staff’s review has determined that the Commission has the authority to grant

⁴⁴ 66 Pa. C.S. § 1357(c).

⁴⁵ 66 Pa. C.S. § 1358(a).

approval of petitions to raise DSIC rates above 5 percent in order to ensure and maintain adequate, efficient, safe, reliable and reasonable service.⁴⁶ Additionally, the Commission has the authority to suspend or waive the application of other provisions of the Public Utility Code to PGW because of its unique requirements related to being a city natural gas distribution operation.⁴⁷ Therefore, it is Staff's position that the current 5-percent cap can be increased.

The Company's actual 2014 distribution revenue, on which DSIC is applied and the revenue cap is calculated, was \$476 million; therefore, \$23.8 million was the maximum available at the current 5-percent cap. However, if the cap was raised to 7.5 percent, 10 percent or 12 percent, the additional amount available for infrastructure improvement through the DSIC would be \$11.9 million, \$23.8 million and \$33.3 million, respectively. At PGW's 2014 replacement cost per mile of \$1,314,051,⁴⁸ raising the DSIC cap could increase PGW's pipeline replacement from 18 miles under the 5-percent cap up to an additional nine miles per year under the 7.5-percent cap, 18 miles under the 10-percent cap and 23 miles under the 12-percent cap.

Table 27 illustrates the impact on an average residential customer⁴⁹ from different DSIC rate caps. Based on rates effective as of January 2015, the average residential customer using 83 Mcf per year will pay approximately \$1,320.19 for PGW gas service, which includes \$37.89, or 2.87 percent, of the total bill for DSIC at the current 5-percent cap. If the DSIC cap were raised to 7.5 percent, the average customer would pay an additional \$18.95 annually – or \$1.58 monthly – or an average increase of 1.44 percent to their total bill. If the cap were raised to 10 percent, the average customer would pay an additional \$37.89 annually, or \$3.16 monthly, for DSIC – or an increase of 2.87 percent to their total bill. Finally, if the cap were raised to 12 percent, the average customer would pay an additional \$53.06 annually, or \$4.42 monthly, for DSIC – or an increase of 4.02 percent to their total bill. It should be noted that all of these calculations assume that the DSIC rate was billed at the capped amount for an entire year. It should also be noted that DSIC revenues will rise as PGW implements future base-rate increases. Moreover, PGW likely would not be able to ramp up personnel/contractors to complete the work at the 10-percent and 12-percent levels for some time. As such, the Company could implement the DSIC cap increase from 7.5 percent to 10 percent after a three- to five-year period and wait another three to five years before raising the cap above 10 percent. Additionally, while the rate cap would be raised when approved, it would take some time for the Company to acquire the necessary resources to complete the work at those levels, likely resulting rates increasing gradually from one cap level to the next.

⁴⁶ 66 Pa. C.S. § 1358(a).

⁴⁷ 66 Pa. C.S. § 2212(c).

⁴⁸ The \$1,314,051 replacement cost per mile for 2014 was reported by PGW to the Commission's Gas Safety Division in FL-1-15. Staff recognizes that PGW has traditionally replaced higher-cost pipe through the DSIC and lower-cost pipe through base rates. If that trend continues, it would reduce the miles that are actually replaced through the DSIC from what is stated here. However, for illustrative purposes only, this discussion shows the additional miles that could be replaced at PGW's reported 2014 replacement cost if the DSIC cap were increased.

⁴⁹ It should be noted that the average residential customer discussed does not include customers with discounted bills as part of PGW's customer-assistance programs.

Table 27: Average Residential Customer Bill Impacts for DSIC Above 5 Percent Based on 83 MCF Annual Usage and 5-Percent DSIC Rate as of Jan. 1, 2015

Total Bill* \$1,320.19				
DSIC Rate	Total Bill Impact	Annual Amount Over 5 Percent	Amount Per Month	Amount Per Day
7.5%	1.44%	\$ 18.95	\$ 1.58	\$ 0.05
10%	2.87%	\$ 37.89	\$ 3.16	\$ 0.10
12%	4.02%	\$ 53.06	\$ 4.42	\$ 0.15

*Based on rates effective as of Jan. 1, 2015, including 5 percent for DSIC.

PGW replaces 18 miles of mains every year as part of its normal replacement program, which is funded by base rate revenue and not through PGW’s DSIC. Due to inflation, the amount spent as part of this program increases, but 18 miles are to be replaced before the additional pipe replacement efforts are eligible for DSIC recovery. The DSIC, however, has a specified limit in the additional amount of money expended for additional pipe replacement that can be recovered. Due to inflation, a dollar of DSIC today would replace more pipe than a dollar of DSIC in the future.

On an overall basis, customers of investor-owned utilities pay less today for DSIC-eligible property (i.e., only annual depreciation, cost of debt and return on equity) installed than the utility must spend at the time of installation to put an asset in the ground. However, ratepayers will pay more over the life of the asset than was originally expended to build the asset, which enables the utility and its shareholders to earn a return of and on investment. Therefore, by leveraging DSIC expenditures and depreciation, an investor-owned utility can accelerate its main replacement by 7.1 to 8.7 times its actual annual expenditure, versus the immediate annual rate impact to customers. In other words, customers pay only 11 to 14 percent of the actual annual cost of DSIC projects through DSIC or base rates.

On a relative basis, PGW’s DSIC mechanism costs the ratepayer more in the short term, as the full cost of the plant placed in service is effectively expensed and recovered over a quarter, as opposed to being recovered over the life of the asset. However, PGW’s DSIC mechanism has a lower overall long-term cost, since customers do not continue to pay for the asset through depreciation and rate of return far into the future – i.e., over the average service life of the asset. Despite that benefit, this methodology limits the amount of potential infrastructure improvement per dollar of immediate rate impact (i.e., financial leverage). As previously mentioned, an investor-owned utility can leverage its dollar of expenditure by 7.1 to 8.7 times, whereas PGW’s DSIC does not provide any financial leverage. More specifically, PGW’s rate design, including the DSIC mechanism, results in current ratepayers paying the full cost of long-term assets, some of which will last well into the future (i.e., 40 to 80+ years). Therefore, current PGW customers on a cash flow basis pay for infrastructure that will benefit both current and future customers over the life of the asset. In contrast, rate-of-

return utilities' DSICs, like those employed by investor-owned utilities; recover costs over the life of the asset, thereby more closely matching the cost recovery of the asset to the timing of the use of the asset.

Table 28 shows the impact that increasing the DSIC will have on accelerating PGW's pipeline replacement rate (assuming that the pay-as-you-go approach is maintained).⁵⁰ As shown, under PGW's assumptions used in this table, its cast iron replacement rate will decrease from 79 years at the current 5-percent DSIC cap to 39 years at the 12-percent DSIC cap.

Table 28: Impact of DSIC Increase on Cast Iron Replacement⁵¹

Scenario	Program Years to Eliminate Cast Iron Mains	Year 1 (\$ Millions)			Last Year (\$ Millions)			Total Cost for the Program (\$ Millions)
		DSIC in FY 2016	Budget for Baseline 18-Mile Program (excluding Services)	Total Capital Budget for CIMR	DSIC as of the Last Year of Program	Budget for Baseline 18 Mile Program (excluding Services)	Total Capital Budget for CIMR	
DSIC= 5% No rate Increase	79	\$22	\$20	\$42	\$22	\$95	\$117	\$5,800
DSIC= 5% Rate Increase of 5% every 5 yrs	68	\$22	\$20	\$42	\$44	\$76	\$120	\$5,000
DSIC= 7.5% Rate Increase of 5% every 5 yrs	54	\$33	\$20	\$53	\$56	\$58	\$114	\$4,300
DSIC= 10% Rate Increase of 5% every 5 yrs	44	\$44	\$20	\$64	\$68	\$47	\$115	\$3,800
DSIC= 12% Rate Increase of 5% every 5 yrs	39	\$53	\$20	\$73	\$78	\$43	\$121	\$3,700

⁵⁰ PGW calculated the estimated available funds (in millions) each year for cast iron main replacement by taking the sum of the estimated budget for the 18-mile main replacement program (including a 2-percent annual inflation factor) and the available DSIC funding (including a 5-percent increase every five years to account for an assumed increase in non-fuel revenue associated to a rate increase). In addition, PGW determined cost per foot assumptions broken down by cast iron pipe diameter. The "years to eliminate" and "total cost" (main only) figures were then calculated without consideration of what specific main diameter types are replaced by year. From a total timeline and total cost perspective, the order in which specific pipe diameters are replaced doesn't have an impact, as each is assumed to have the same inflation factor. As a result, PGW determined the total "years to eliminate" using the annual available funds and decreasing the cast iron main one diameter class at a time until it is depleted completely before moving on to the next class in a serial manner. The formula would be as follows: X linear foot of main = annual available funds / cost per linear foot by diameter.

Once all main is depleted, the years are summed to determine the total "years to eliminate" and the annual costs are summed to determine the "total cost."

⁵¹ FA-21.

Below is the incremental customer impact of a phased-in DSIC increase approach, which assumes PGW’s DSIC will increase to 7.5 percent in 2017, 10 percent in 2020 and 12 percent in 2023:

Table 29: Average Residential Customer Bill Scenario with DSIC and Base Rate Increase

Incremental Impact - Average Residential Customer Bill			
Year	2017	2020	2023
DSIC Rate	7.5%	10.0%	12.0%
Customer Impact (\$)	\$18.95	\$39.78	\$58.49
Customer Impact (%)	1.44%	2.93%	4.19%
<p>* Based on 83 MCF per year and January 2015 Rates Assumes 5-percent base rate increases in 2018 and 2023 GCR rate of \$6.43 per MCF for 2020 and 2023.</p>			

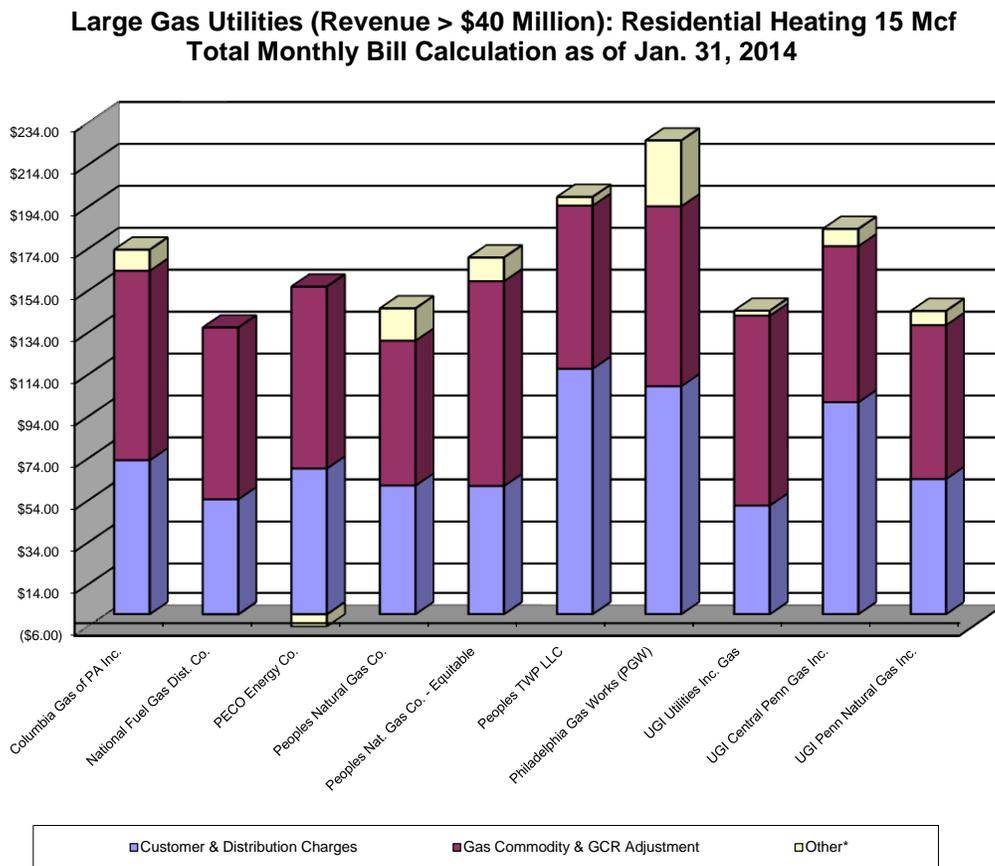
Staff notes that if a revenue increase is needed to expedite the replacement of high-risk pipe, recovery through increased DSIC rates is preferable to recovery through increases in base rates. While a traditional distribution rate increase may generate more revenue, there is no guarantee that the additional revenue will actually be expended for pipe replacement or infrastructure improvements rather than other operational needs. In contrast, the purpose of the DSIC is to accelerate investments in infrastructure improvement and replacement of aging infrastructure. Therefore, using the DSIC for recovery of incremental main replacement expenditures is preferable to a traditional base rate increase because the revenue generated by DSIC can be restricted to recovery only for eligible infrastructure improvement projects (i.e., main replacement) that are actually completed and placed in service. In a general base rate case, the approved revenue level is established to provide recovery of a large mix of potential expenditures and/or net income, which are not specifically tracked, nor trued up. Conversely, DSIC revenues are ultimately limited to actual expenditures and are subject to reconciliation and Commission audit. In fact, as previously mentioned, per Commission Order at Docket No. R-00005654 entered Nov. 22, 2000, PGW’s DSIC recovery excludes the cost of the Company’s 18 miles replaced annually as part of its normal replacement program, which is recovered via base rates.

Additionally, it is important to note that both the Philadelphia City Council and the Company are considering increasing the DSIC to 7.5 percent to accelerate PGW’s main replacement efforts. In a letter to Mayor Nutter dated Oct. 27, 2014, City Council recommended that PGW submit a petition to the Commission to increase the DSIC to 7.5 percent.⁵² On March 20, 2015, PGW submitted a letter to the PGC indicating the Company’s intent to seek Commission approval to increase the permissible DSIC surcharge percentage from 5 percent to 7.5 percent.⁵³

⁵² Appendix A.
⁵³ Appendix B.

Although Staff believes that the DSIC is the best method to accelerate PGW’s pipeline replacement, there are some challenges to increasing rates for PGW’s customers. First, as shown on Table 30 below, PGW’s residential rates are already the highest in the state among NGDCs. Standard & Poor’s (S&P) notes that “PGW’s residential heating rates are 14 to 65 percent higher than those of other utilities in the state.” S&P suggests that these high rates are due to historically weak collections, sizable bad debt expense, customer responsibility and senior discount programs, and a high portion of low-income customers receiving subsidized service.⁵⁴

Table 30: Large Gas Utilities Monthly Bill Calculation as of Jan. 31, 2014



Second, the Commission’s 2013 Report on Universal Service Programs & Collections Performance notes that approximately 33 percent of PGW’s customers were confirmed to be low-income customers, and approximately 40 percent were estimated to be low-income, as defined as household income at or below 150 percent of the Federal Poverty Income Guidelines. PGW’s statistics far exceed the average NGDC rate of 17.7 percent confirmed low income and 26 percent estimated low-income customers.

⁵⁴ S&P Ratings Direct, *Summary: Philadelphia, Pennsylvania; Gas; Joint Criteria*, Oct. 21, 2014, p. 3.

Third, although collection rates have improved, low collection rates have been a continual issue for PGW. Table 31 shows that collections reached a historic low of 87 percent in 2003, improved to 91.7 percent in 2004 and, with the exception of Fiscal Year 2013 (91.9 percent), have subsequently improved to 94 percent or better since then. Additionally, the Commission’s 2013 Report on Universal Service Programs & Collections Performance reports that PGW’s gross write-offs ratio, which measures the residential dollars written off to the annual total dollars of residential billings, was 10.4 percent in 2013. According to this report, the average gross write-offs for all Pennsylvania NGDCs in 2013 was 3.7 percent. Outside of PGW’s 10.4 percent gross write-off ratio, gross write-off ratios for the other PA NGDCs’ ranged from a low of 0.5 percent to a high of 3.6 percent.

Table 31: PGW’s Fiscal Year Collection Rates 2003-2014

FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
87%	91.47%	96.0%	96.6%	95.8%	95.5%	93.8%	98.7%	95.1%	96.6%	91.9%	94.9%

Staff is not able to quantify the impact a DSIC or base-rate increase will have on PGW’s collection rates; however, given the high percentage of low-income customers, it is likely that such increases will reduce the ability to pay their bill in full and on time. However, due to the recent reductions in the gas cost rates and projections that natural gas costs will remain low, there may be an opportunity to accelerate pipeline replacement by increasing the DSIC cap without raising customers’ overall rates above prior levels.

Opportunity No. 2 – Levelize and Annualize DSIC-Eligible Costs

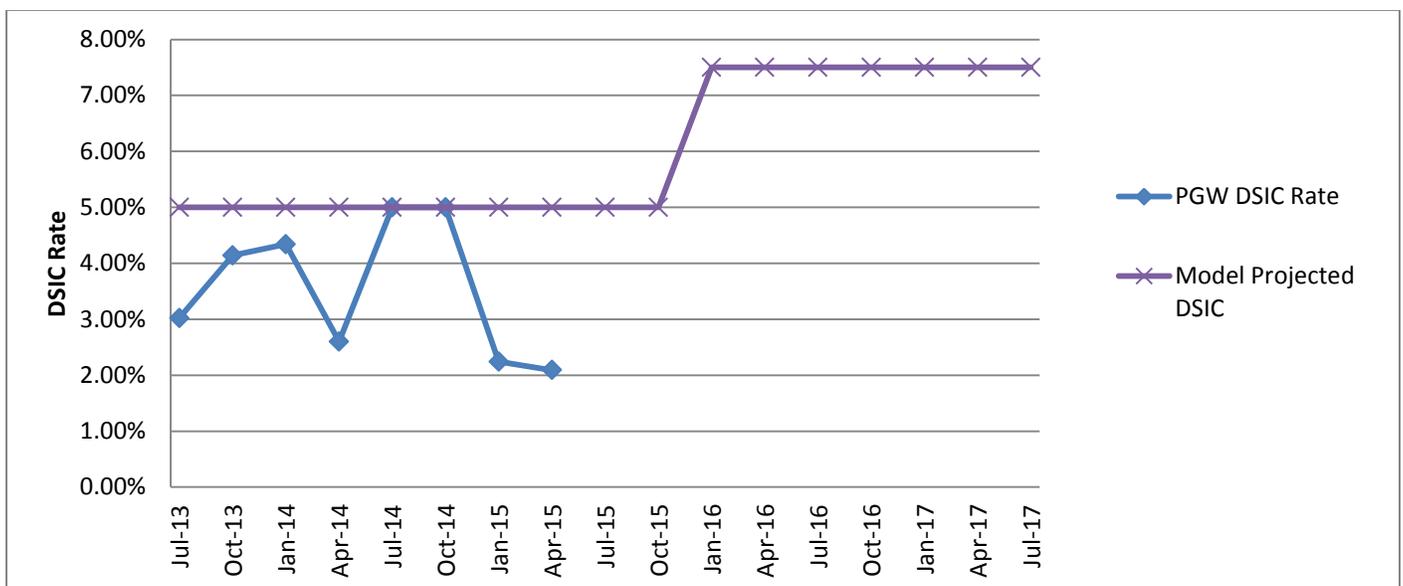
Ideally, the DSIC rate should remain relatively level throughout the year in order to pass costs equally to all customers, regardless of seasonal usage patterns, and to both levelize and maximize PGW’s revenue stream. However, Staff has noted that during its first eight quarters of application, PGW’s DSIC mechanism in its current form has resulted in significant rate fluctuations, rather than a steady or steadily increasing revenue stream, as described in Opportunity No. 1. Due to such factors as amount of eligible property expenditures completed each quarter, seasonal construction conditions, etc., as depicted in Table 32, PGW’s DSIC rate has fluctuated from 5 percent to as low as 2.09 percent. Worse yet, the lowest rate has become effective at the high sales volume quarter, creating a discounted revenue flow and irregular over- or under-collections.⁵⁵ This problem is more noticeable with NGDCs than other types of utilities using DSICs in that most gas sales occur during the five colder months of the year; however, construction usually occurs during the warmer months. An investor-owned NGDC’s DSIC rates still will remain relatively level throughout the year, due to

⁵⁵ Over-collections occur when revenues exceed the cost. Under-collections occur when costs exceed revenue collected. Over- or under-collections are later refunded or recovered through the experience factor (e-Factor) component of the rate.

the incremental recovery of only return on investment and depreciation cost of infrastructure improvement since the last base rate case. PGW’s DSIC rate disparity is greater, as the full cost of the asset is recovered immediately in the next quarter – and in some quarters when little construction is occurring, little or no costs are being recovered.

As shown below in Table 32, if PGW’s cash-basis DSIC was designed similarly to the methodology generally used for other non-DSIC adjustment clauses or pass-through mechanisms, the DSIC rates and recovery would be more levelized, providing improved rate stability and a more predictable cash flow, even with seasonally driven expenditures and sales volumes. Alternately, the DSIC rate could be computed based on projected annual expenditures instead of the highly fluctuating, quarterly expenditures currently used. For instance, the DSIC could be computed from PGW’s approved LTIIP divided by projected annual distribution revenue, which could be expressed as a percentage and applied to the total amount billed for distribution service, creating the DSIC rate. As a safeguard, and similar to all DSIC mechanisms, the total DSIC rate would not be permitted to exceed the approved rate cap. If this methodology were adopted, PGW’s DSIC-eligible costs incurred from “completed and placed in service projects” would be reconciled to the actual revenues collected, and any over- or under-collected amounts would be refunded to or recouped from customers through an annual reconciliation process. If the Company recovered more money than it spent on eligible projects, it would be required to refund the money to customers, possibly with interest. Unlike other investor-owned NGDCs’ DSICs, PGW’s DSIC would not be reset to zero at the time of a base rate case and therefore the over- or under-collections would be continuously refunded to or recouped from ratepayers, as is standard practice in other traditional adjustment clauses.

Table 32: PGW Effective DSIC Rates & Model Projected Rates July 2013-July 2017



DSIC expenditures would be the difference in amounts expended between PGW's baseline main replacement program, which is recovered via base rates, and the total amount spent for main replacement. In 2014, PGW spent approximately \$42 million on its main replacement program. The baseline program for which the cost is recovered via base rates consists of 18 miles of 8" diameter and smaller pipe, and PGW has indicated that this base of 18-mile replacement will cost approximately \$20 million annually for years 2014 to 2017. According to the Company's LTIP, during the years 2014 to 2017 the DSIC program is designed to annually replace approximately seven miles of a variety of main sizes and types of pipe (including all pipe replacements larger than eight inches in diameter) at a cost of \$22 million. As an additional consumer safeguard, the DSIC mechanism could be designed such that it is tied to total main replacements expenditures, including amounts recovered through base rates, such that if PGW does not meet the baseline levels, then that amount of underspending and related over-recovery would be refunded via the DSIC.

It is noteworthy that PGW requested use of projected annualized costs in its DSIC Petition at Docket No. P-2012-2337737. At that time, certain parties objected to PGW's request, noting that Act 11 only permits costs that are actually incurred to be eligible for DSIC recovery. While the Commission agreed that PGW had not presented legal or factual basis to recover annualized costs through the DSIC, it noted that PGW has the opportunity to seek a waiver or suspension of Act 11, pursuant to Section 2212(c) of the Public Utility Code.⁵⁶ Based on actual experience with PGW's unique DSIC mechanism and circumstances over the past two years, Staff recognizes that it may be beneficial to reconsider this option if re-proposed by PGW. Staff's analysis indicates that this change in the mechanism would facilitate the recovery of additional DSIC revenue that could be used to further expedite main replacement, but may not match on a quarterly basis what PGW has actually completed. To provide an additional consumer assurance that PGW will strive to complete installation of pipe and other infrastructure improvements at the levels included in its projections used to compute the annualized DSIC, PGW could be required to pay interest on over-collections to discourage intentional over-projection of infrastructure expenditures.

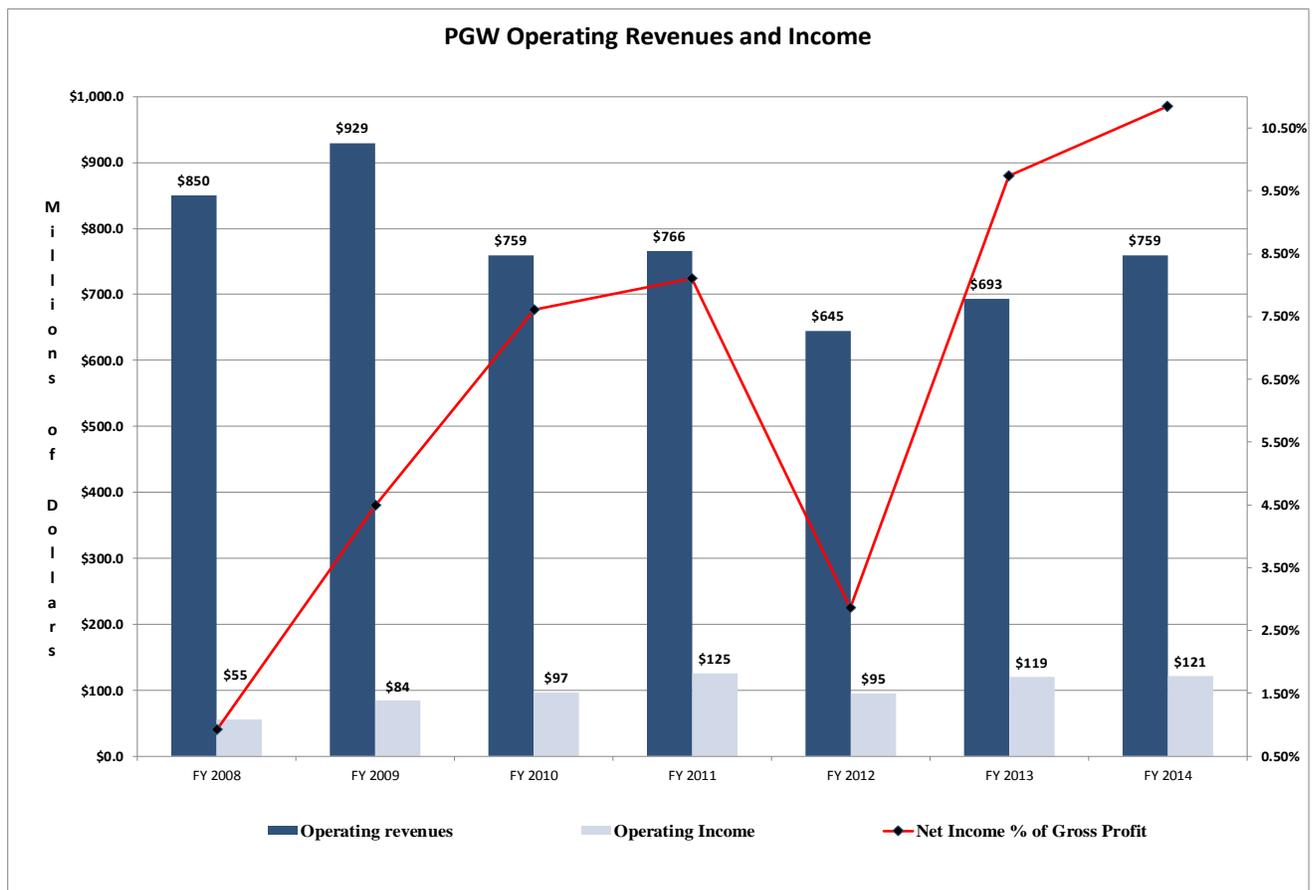
Opportunity No. 3 – Issue New Debt

PGW's financial health has improved considerably since coming under the Commission's jurisdiction in 2000. Its debt-to-total-capital ratio is projected to continue to improve, and its interest-coverage ratio appears well above two times, which is above the Company's 1.5-times requirement. For the reasons expressed below, it is Staff's position that PGW, as a municipally owned utility, can operate at a much higher debt-to-total-capital ratio than an investor-owned utility; perhaps as high as a long-term debt to total capital ratio of 70 percent. Accordingly, PGW should explore issuing new debt to fund an aggressive pipeline replacement program.

⁵⁶ 66 Pa. C.S § 2212(c).

In 2009, the Commission approved PGW’s requested emergency base rate increase of \$60 million. Since that time, PGW’s financial position has improved considerably. Cash flow problems that historically plagued the Company have improved such that PGW has not used its Commercial Paper Program for working capital since May 2009. PGW notes that as of Dec. 19, 2014, \$120 million was available from the commercial paper program, and its cash balance was \$80.6 million.⁵⁷ Additionally, PGW’s current bond ratings are A- from S&P and Baa2 from Moody’s Investor Service. S&P raised its rating on PGW’s 1975 General Ordinance (‘75 GO) and 1998 General Ordinance (‘98 GO) bonds from BBB+ to A- in October of 2014. S&P notes that “The upgrade reflects our view of improving trends related to collections, coverage of fixed costs, liquidity and debt ratios for PGW, as well as the adoption of a number of credit-supportive policies and procedures.”⁵⁸ Tables 33 and 34 illustrate that PGW’s operating and net income have stabilized and that its debt to total capital, debt service coverage and collection rates have improved.

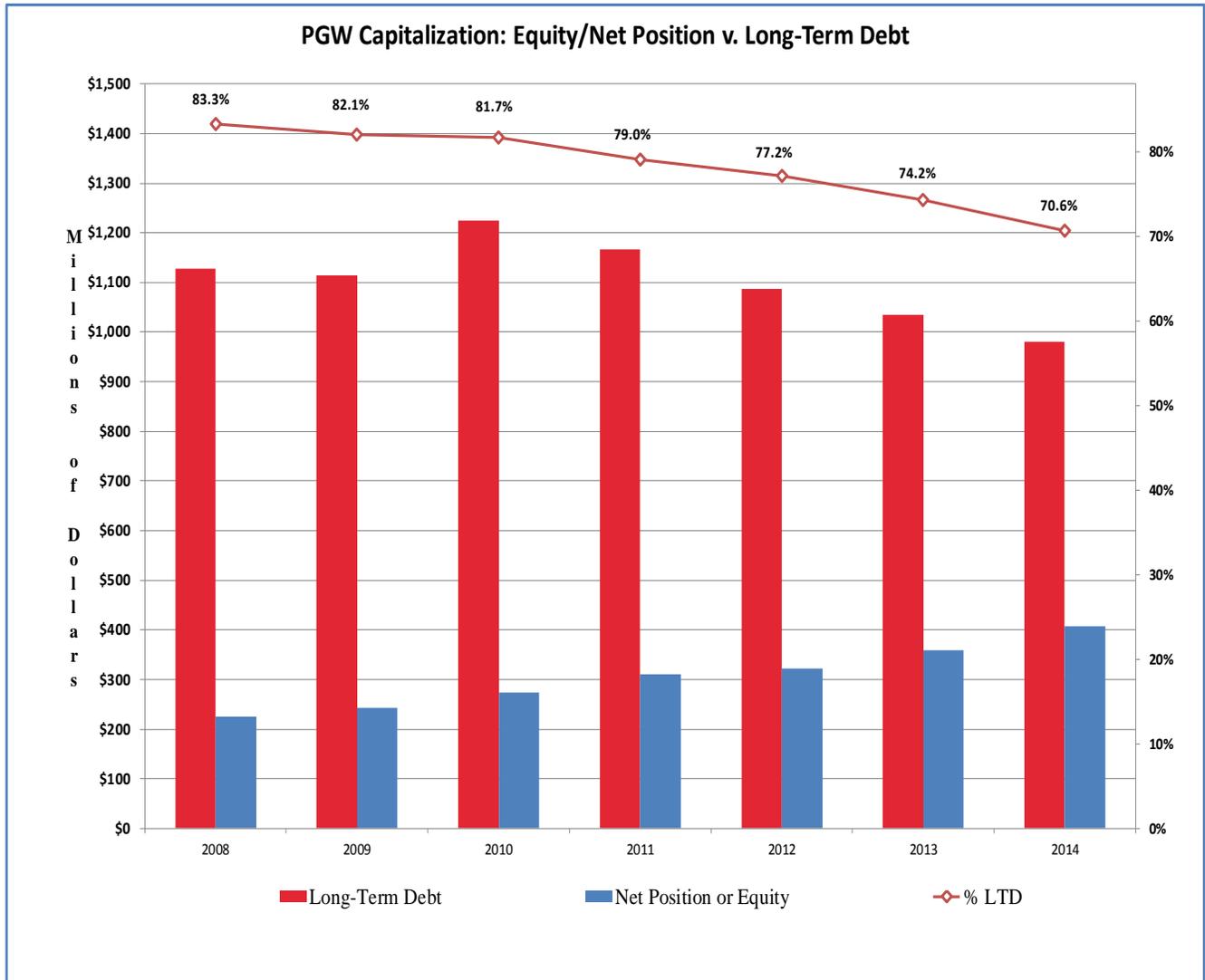
Table 33: PGW Operating Revenues and Income FY 2008-2014



⁵⁷ FY 2014 Financial Highlights, p. 3.

⁵⁸ S&P RatingsDirect, Summary: Philadelphia, Pennsylvania; Gas; Joint Criteria, Oct. 21, 2014, p. 3.

Table 34: PGW Capitalization: Equity/Net Position v. Long-Term Debt 2008-2014

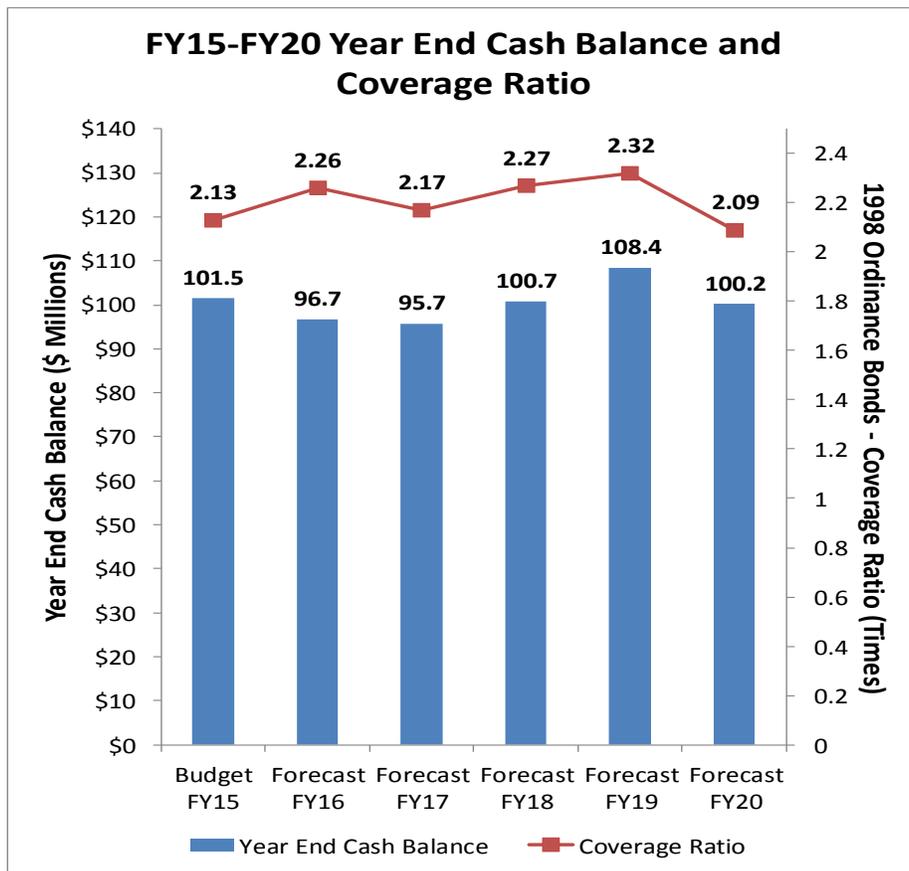


PGW has historically financed its capital expenditures with long-term debt. The Company also may use short-term debt that is available through its commercial paper program. PGW can issue debt in the following manner:

- Commercial Paper – Commercial paper is short-term debt with a maximum maturity of 270 days. PGW has not issued commercial paper for working capital since May 2009 and has no notes outstanding as of Jan. 30, 2015. PGW anticipates issuing commercial paper during Fiscal Year 2015.
- Interim Debt – PGW has the ability to use interim funding instruments such as bond anticipation notes or other temporary borrowing that would be permanently financed with long-term debt.
- Long-Term Debt – PGW can issue Gas Works Revenue Bonds (GWRB) under the '75 GO and '98 GO. Debt issued under the '75 GO is senior to the '98 GO. The '75 GO is closed to new debt issuance; however, bonds to refund outstanding '75 GO bonds may still be issued. Debt issued under the '98 GO can be either new or refunded.

Per the terms of the General Ordinances, PGW must maintain a debt service coverage ratio of 1.5 times on each of the General Ordinances. As such, PGW must have funds available to service its debt one and a half times greater than the cost to service its debt. Due to the fact that the '75 GO is senior to the '98 GO, the ratio is calculated separately for each ordinance. Thus, the debt-service-coverage ratio will always be lower for the '98 GO. The debt-service coverage was at 6.15 debt service on the '75 GO bonds and at 2.11 debt service on the '98 GO bonds in Fiscal Year 2014, which is well above the required 1.5 times coverage. Moreover, as shown in Table 35, PGW projects coverage ratios in excess of two times through fiscal year 2020; therefore, it appears that issuing new debt to fund infrastructure replacement will likely not cause PGW to go below its required 1.5-times coverage ratio.⁵⁹

Table 35: FY 15 – FY 20 Year End Cash Balance and Coverage Ratio⁶⁰



Based on PGW’s approved Fiscal Year 2015 budget through its 2020 Fiscal Year forecast, PGW anticipates capital spending in aggregate of approximately \$606 million. PGW estimates that 56 percent of this spending will be financed with internally generated funds, and 44 percent of this funding will be financed with debt. Tables 36 and 37 detail the projected annual financing of PGW’s capital funding sources.

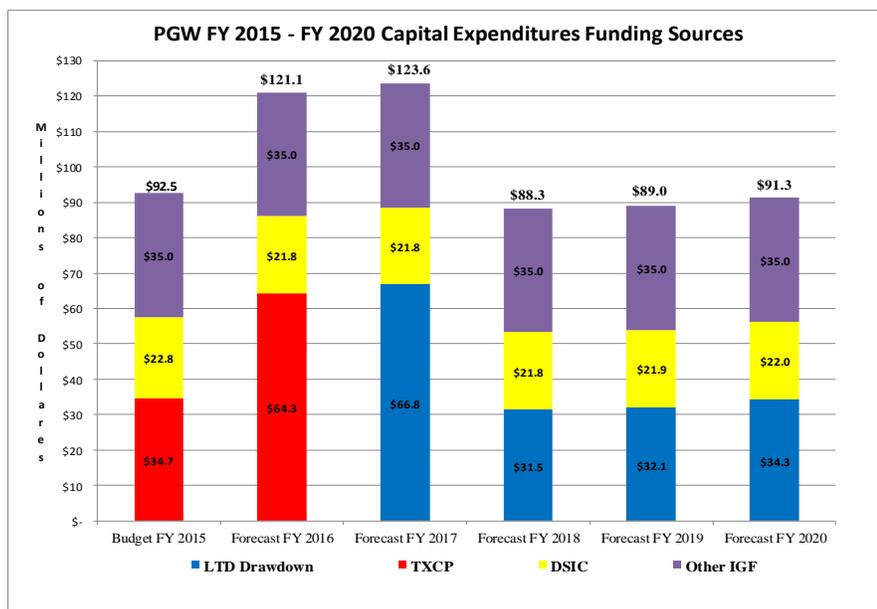
⁵⁹ Based on PGW’s budgeted and five-year forecasted revenue and expense levels, which project interest-coverage ratios of 2.09 times or higher.

⁶⁰ PGW’s Fiscal Year 2015 operating budget and five-year forecast.

Table 36: Sources and Uses of Cash for Capital Improvement Expenditures FY 11 - FY 20⁶¹

Philadelphia Gas Works Sources and Uses of Cash For Capital Improvement Expenditures Fiscal Years 2011 Through 2020 (\$ Thousands)							
	Budget FY 2015	Forecast FY 2016	Forecast FY 2017	Forecast FY 2018	Forecast FY 2019	Forecast FY 2020	Total FY 2015- 20
Capital Expenditures	\$92,550	\$121,083	\$123,598	\$88,293	\$88,986	\$91,262	\$605,772
Funding Sources:							
TXCP Draw	\$34,706	\$64,265	-	-	-	-	\$98,971
LTD/CIF Draw	-	-	\$66,798	\$31,450	\$32,100	\$34,293	\$164,641
DSIC Revenue	\$22,844	\$21,818	\$21,800	\$21,843	\$21,886	\$21,969	\$132,160
Other IGF	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$210,000
% Pay-Go	62.5%	46.9%	46.0%	64.4%	63.9%	62.4%	56.5%
% Debt Finance	37.5%	53.1%	54.0%	35.6%	36.1%	37.6%	43.5%
TXCP = commercial paper program; LTD = Long-term debt CIF = Capital Improvement Fund DSIC = distribution system improvement charge; IGF = internally generated funds							

Table 37: PGW FY 15 - FY 20 Capital Expenditures Funding Sources



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FA-5 and PGW's Five-Year Forecast.

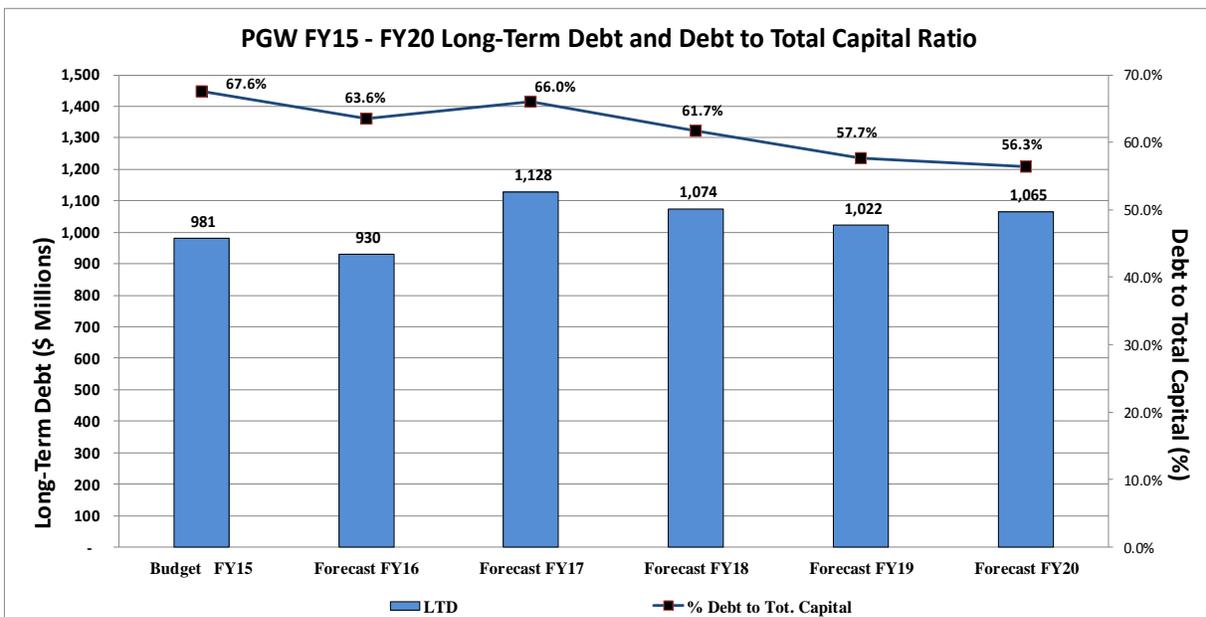
PGW's capital spending funding sources include the following assumptions:⁶²

- \$99 million of commercial paper will be used to fund capital expenditures in Fiscal Years 2015 and 2016;
- \$250 million long-term debt financing issued in September 2016 to support capital expenditures and pay-off \$99 million of outstanding commercial paper;
- \$100 million long-term debt financing issued in September 2019 to support capital expenditures; and
- Capital improvement fund balance as of Aug. 31 of the budget year.

Capital Improvement Fund Balance (\$ Millions)	
FY 2015	\$0
FY 2016	\$0
FY 2017	\$64,066 (\$250 million new bond)
FY 2018	\$32,832
FY 2019	\$823
FY 2020	\$58,527 (\$100 million new bond)

Even with the two anticipated two long-term debt offerings in 2016 and 2019, Table 34 demonstrates that PGW projects that its long-term debt-to-total capitalization will continue to improve. Long-term debt as a percentage of its total capitalization is projected to fall from 67.6 percent in Fiscal Year 2015 to 56.4 percent in Fiscal Year 2020.

Table 38: PGW FY 15 – FY 20 Long-Term Debt and Debt-to-Total-Capital Ratio

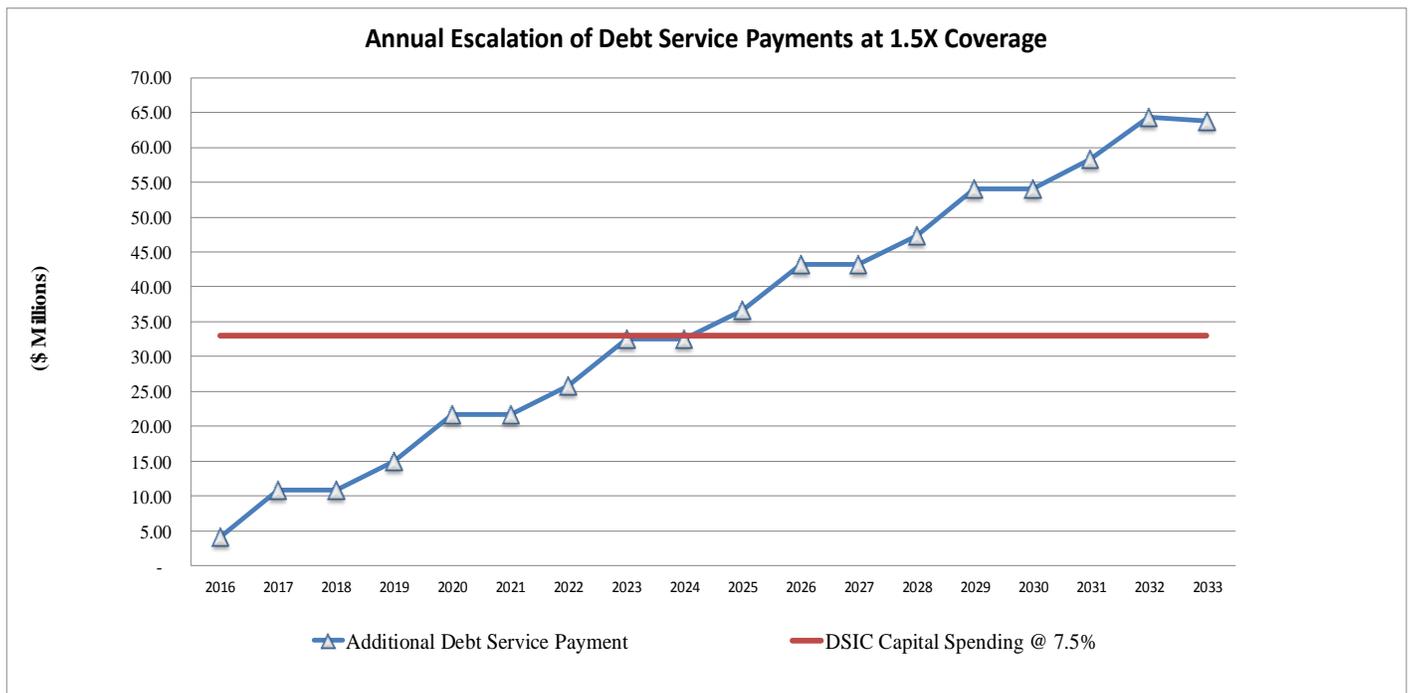


⁶² PGW's Fiscal Year 2015 operating budget and five-year forecast.

Staff believes that PGW can operate at a much higher debt-to-total-capital ratio than the projected 56 percent. As a municipally owned utility, PGW can operate with a long-term debt-to-total-capital ratio perhaps as high as 70 percent.⁶³ Additionally, financing infrastructure improvement with long-term debt better matches the recovery of these capital expenditures with the useful life of the capital asset which, in turn, matches recovery of cost from the ratepayers who benefit from the utility incurring the cost. Moreover, PGW is permitted, per 66 Pa. C.S. § 1357(c), to recover through its DSIC the cost of associated financing, including debt service, debt-service coverage and issuance costs.⁶⁴ Accordingly, issuing new debt is an avenue PGW should explore to accelerate its pipeline replacement.

The chart below illustrates a comparison of the additional capital spending of \$33 million recovered through a DSIC mechanism, versus the financing cost of issuing \$100 million⁶⁵ of debt every three years to finance \$33 million of additional capital expenditures:

Table 39: Annual Escalation of Debt Service Payments at 1.5X Coverage⁶⁶



According to PGW’s analysis, the cost of the issuance of long-term debt would equal, then exceed, the \$33-million cost per year, somewhere between year nine (2024) and year 10 (2025). PGW’s cost-of-debt analysis includes interest cost,

⁶³ Staff acknowledges that increased financial leverage creates additional risks associated with interest payments and the repayment of principal, which may reduce PGW’s financial flexibility.

⁶⁴ 66 Pa. C.S. § 1357(c).

⁶⁵ PGW’s example suggests that the bond issuance would actually be \$110 million, which would result in approximately \$101 million being available to fund construction.

⁶⁶ FA-22.

plus the coverage of those interest costs at 1.5 times, to cover the '98 GO bond interest coverage covenant, sinking fund requirement costs and any amortization of issuance costs and bond discount.⁶⁷

Should debt financing be used for accelerated pipeline replacement, the amount to be recovered from ratepayers would be lower initially, but would eventually cross over and become higher. In the chart above, PGW's cross-over point is sooner due to the interest coverage requirements (1.5 times) and its projected sinking fund requirements. However, if PGW would use a combination of an increased DSIC rate (7.5 percent) along with the issuance of long-term debt, the cross-over point could be extended further into the future and better match the cost of the pipe replaced with the ratepayers who would benefit from this investment.

Opportunity No. 4 – Improve Cash Management

PGW has indicated a need to maintain a \$100 million cash balance. It is Staff's position that the \$100 million appears to be excessive and that the Company could leverage an additional \$25 million for financing pipeline replacement directly or through the issuance of additional debt by lowering its requirement to have \$100 million in cash on hand.

For Fiscal Year ending Aug. 31, 2014, PGW had cash and cash equivalents of \$105.7 million and had no short-term borrowings under its commercial paper program. Additionally, PGW maintains four restricted accounts which had the following Fiscal Year 2014 balances:

- Capital Improvement Fund – \$0; required per the bond ordinances to hold bond proceeds from the issuance of revenue bonds.
- Sinking Fund, revenue bonds – \$105.9 million; required per the bond ordinances to hold the maximum annual debt service of the outstanding revenue bonds.
- Workers' Compensation Escrow Fund – \$2.6 million; required per state law to hold the amount established by the state to allow PGW to be self-insured for workers' compensation liability.
- Health Insurance Escrow Fund – \$3.2 million; required by contract for PGW's self-insured health insurance plan.⁶⁸

PGW maintains that, contingent upon stable prices and consistent cash receipts through the heating season, its goal is to have approximately \$100 million in cash at the end of the fiscal year in order to provide liquidity needs through the

⁶⁷ PGW's cost of debt assumes a \$110 million bond issued with a 5-percent coupon rate that matures in 30 years. Issuance costs are assumed to be 1 percent of face value (\$1.1 million) and a discount off face value of 0.6 percent (\$.66 million) is assumed.

⁶⁸ FA-19.

heating season.⁶⁹ During Fiscal Year 2014, PGW’s monthly cash balance ranged from a high of \$159.5 million (June) to a low of \$61 million (November). During Fiscal Year 2013, PGW’s monthly cash balance ranged from a high of \$133.8 million (May) to a low of \$28.2 million (November).⁷⁰

PGW’s Fiscal Year 2015 operating budget and five-year forecast continue to project fiscal year-end cash balances of approximately \$100 million and debt-coverage ratios above two times. PGW’s commercial paper program (TXCP) outstanding level and cash balance assumptions at fiscal year-end (Aug. 31):

Table 40: PGW TXCP/Liquidity FY 15 – FY 20

Philadelphia Gas Works TXCP/Liquidity Fiscal Years 2011 Through 2020 (\$ Millions)				
	Maximum	Available	Cash	Liquidity
FY 2015	\$ 120.0	\$ 85.3	\$ 101.5	\$ 186.8
FY 2016	\$ 120.0	\$ 21.0	\$ 96.7	\$ 117.7
FY 2017	\$ 60.0	\$ 60.0	\$ 95.7	\$ 155.7
FY 2018	\$ 60.0	\$ 60.0	\$ 100.7	\$ 160.7
FY 2019	\$ 60.0	\$ 60.0	\$ 108.4	\$ 168.4
FY 2020	\$ 60.0	\$ 60.0	\$ 100.2	\$ 160.2

It should be noted that PGW assumes that earnings rates on temporary cash investments and restricted funds during this time period to be at or below 0.5 percent. Based on the month-end balances over the past two fiscal years and its ability to fund seasonal fluctuations with its commercial paper program, if necessary, PGW should consider lowering its \$100 million cash-on-hand target by approximately \$25 million. Since PGW projects that it can only earn 0.5 percent or less on this money, it would appear that PGW could gain greater utility by spending this money on accelerating its pipeline replacement or leveraging these funds with additional long-term debt to fund capital expenditures.

⁶⁹ FA-18.

⁷⁰ FA-20.

Opportunity No. 5 – Request that the City Waive All or a Portion of the \$18-Million Payment

PGW is subject to governance authority of the PFMC, the PGC, the Mayor of the City of Philadelphia, City Council and the PUC. The PFMC was organized in 1972 by the City of Philadelphia to operate PGW following the expiration of the City’s contract for the administration of PGW with the United Gas Improvement Company. The City entered into a Management Agreement with the PFMC, through City Ordinance No. 455, approved Dec. 29, 1972, to manage and operate PGW for the benefit of the City and requires a fixed annual \$18-million payment by PGW to the City.

In 1996, the Pennsylvania Supreme Court determined that this \$18-million payment was constitutional, just and reasonable, and rationally related to the City's asserted equity in PGW as the owner of the utility.⁷¹ Moreover, the Pennsylvania Supreme Court noted that the annual payment from PGW to the City was not just a matter of contract but required by the 1972 City Ordinance which, “has the force and effect of an act of the Pennsylvania assembly.”

When PGW came under Commission jurisdiction in 2000, the obligation to pay the City the \$18 million continued because the Act directed the Commission to permit PGW to impose a charge that allows it to pay the City an annual amount as specified in the City’s municipal ordinance.⁷² Accordingly, the Commission has recognized that it is required to abide by this statutory directive:

Concerning the City payment, the Legislature sets forth the Commission's authority concerning the transfer or payment of \$18 million by PGW to the City. As stated above, Section 2212(f) of the Act directs the Commission to set rates to permit PGW to meet its \$18-million City payment. At the same time, Section 2212 (f) does not grant the authority to the Commission to order the City to waive or grant back the \$18-million payment. We believe that such condition, as advocated by several Parties, clearly is not within the Commission's authority under the Act.⁷³

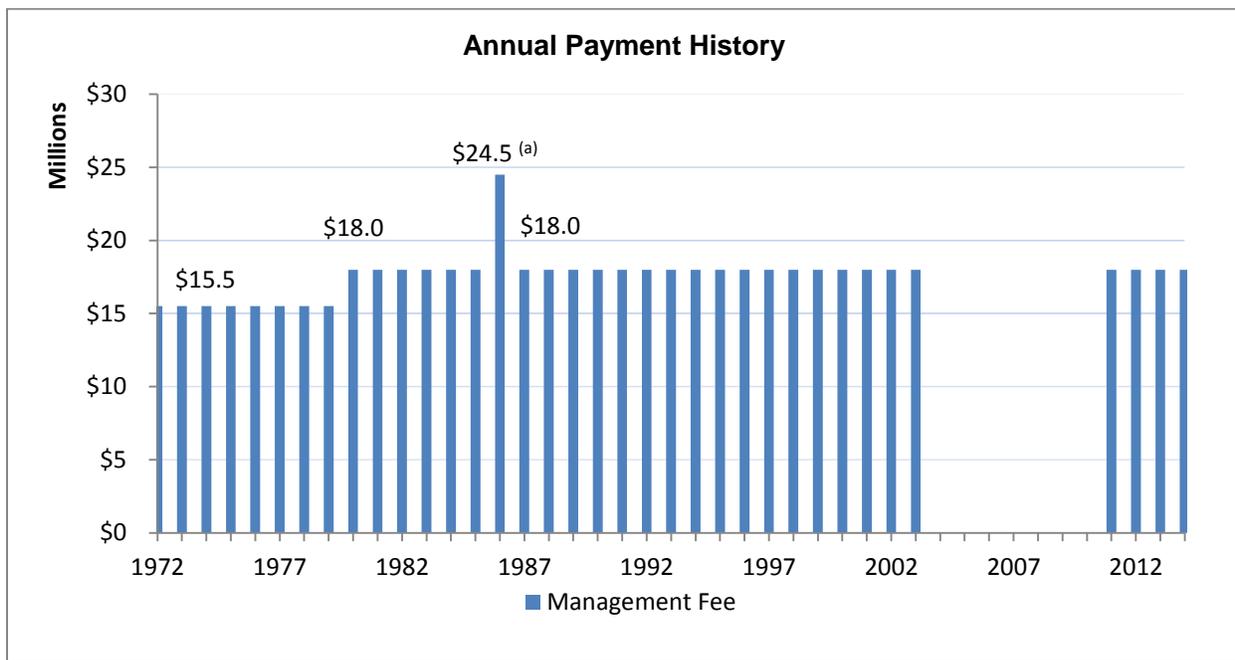
Subsequent to this decision, PGW requested, and received, a waiver of the payment from the City from 2004 through 2010, due to the Company’s weak financial position. During this time period, although still required by law that PGW make the payment, the City granted back the annual payment to PGW. Table 41 illustrates the history of the annual payment from PGW to the City.

⁷¹ *Public Advocate v. Phila. Gas Comm'n*, 674 A.2d 1056 (Pa. 1996).

⁷² 66 Pa. C.S. § 2212(f).

⁷³ *Pa. PUC v. PGW*, Docket No. R-00006042 (Order entered October 4, 2001).

Table 41: Annual Payment History as of January 2015



(a) In 1986, PGW made a one-time Annual Payment of \$24.5 million, at the request of the Mayor, to help the City balance its budget.

Ref: October 2013, Philadelphia Gas Works Cost/Benefit Analysis prepared by Lazard Frères & Co. LLC

In PGW’s 2008 Extraordinary Rate Relief proceeding, the Commission ordered PGW to take all appropriate steps to seek the repeal of the ordinance mandating an annual \$18-million payment to the City of Philadelphia.⁷⁴ In its subsequent base rate proceeding, PGW was asked to provide all documentation demonstrating its compliance with the Commission’s Order regarding repeal of the ordinance.⁷⁵ PGW produced a letter, dated Feb. 18, 2009, requesting that the City initiate the process to repeal the annual payment to the City, but indicated that it was not aware of whether any subsequent action was taken.⁷⁶ PGW stated that it spoke with various City officials in the Mayor’s office and City Council, who indicated that it would be a “foolish waste of time to pursue repeal of the ordinance” given the state of the City’s fiscal problems.⁷⁷

The Commission cannot force PGW to use any of the \$18-million annual payment as a source of capital funding. However, based on past precedent established by the City to waive, or grant back, the annual payment in situations when the utility is facing financial trouble, it is reasonable to request that the City waive, or grant back, the annual payment, or a portion thereof, in order to enable expedited replacement of deteriorating cast iron and unprotected steel mains and service lines to help prevent gas leaks/explosions and ensure the safety of the public. The City’s

⁷⁴ *Pa. PUC v. PGW*, Docket No. R-2008-2073938, pp. 36-37, 49 (Order entered Dec. 19, 2008).

⁷⁵ *Pa. PUC v. PGW*, Docket No. R-2009-2139884, I&E St. No. 2, p. 26.

⁷⁶ *Pa. PUC v. PGW*, Docket No. R-2009-2139884, I&E Ex. No. 2, Sch. No. 12.

⁷⁷ *Pa. PUC v. PGW*, Docket No. R-2009-2139884, PGW St. 1R, p. 2.

agreement to reinstate a waiver for a portion or the entire \$18-million payment to help PGW’s pipeline replacement efforts could result in approximately 14 miles of additional pipe replaced annually at PGW’s 2014 average replacement cost of \$1,314,051 per mile.

Since PGW’s customers already are paying for the \$18-million annual payment, redirecting this amount, or a portion thereof, to main replacement will not increase costs to customers. However, it is important to note that this shift will temporarily eliminate or reduce a source of revenue to the City of Philadelphia, which in theory could increase costs to taxpayers. While the Pennsylvania Supreme Court found the \$18-million payment to be a sufficient return on equity for the City of Philadelphia, it should also be noted that the potential safety problems of failed infrastructure does not distinguish between ratepayer or taxpayer.

Opportunity No. 6 – Streamline Corporate Governance Structure

As previously discussed, although PGW’s rates and service are regulated by the Commission, the Company’s current local governance structure involves the Mayor, City Council, City Controller, the PGC and the PFMC. The governance structure of PGW was identified as an issue in both the 2001 PUC Stratified Management and Operations Audit conducted by the Barrington Wellesley Group, and the 2008 PUC Stratified Management and Operations Audit, conducted by Schumaker & Company. This issue also was reviewed in the respective follow-up PUC Management Efficiency Investigations issued in May 2005 and July 2012.

In both the 2001 and 2008 audits, the consultants identified a fragmented governance structure and recommended a revised or streamlined governance structure in order to establish greater accountability and eliminate overlapping responsibilities between City Council, PGC and the PFMC. The 2001 Audit specifically recommended the elimination of the PGC by assigning its responsibilities to City Council or the PFMC, thereby reducing expenses at the time by \$1.3 million. Moreover, in a 2014 letter to the Mayor, City Council recognized the need to modernize PGW’s governance structure and explore potential structural changes to ensure that PGW’s operations are efficient and effective.⁷⁸

The City ordinances regarding the PGC do not define the composition and functions of the PGC. The ordinances delegate the PGC’s composition and functions to be contractually determined between the City and the “operator of the City gas works,” i.e., PFMC. As such, changes to the PGC can be accomplished either by modifying the contract between the City and PFMC, or through changes to the ordinances. In Fiscal Year 2013, PGC expenses totaled approximately \$800,000,⁷⁹

⁷⁸ Appendix A.

⁷⁹ Disclosed in notes to financial statements in the *2013 PGW Comprehensive Annual Financial Report*.

all of which, or a portion thereof, could be redirected to main replacement infrastructure if the governance structure were streamlined.

In addition, while not quantifiable, PGW's unique governance structure which requires multiple approvals (i.e., formal approvals and/or informal reviews) from various groups (i.e., the PFMC, PGC, City Council, City's Director of Finance and the PUC), inhibits PGW management from operating in the most efficient manner.

Opportunity No. 7 – Consolidate Facilities

As part of its 2006 Business Transformation initiative, noted in the 2008 Stratified Management and Operations Audit conducted by Schumaker & Company, PGW conducted a study to review all of its administrative, district office and outlying stations to rationalize the space being utilized. PGW recognized that its warehouse configuration and associated processes were inefficient, and the Company proposed to consolidate the warehouses, meter shops, field services and fleet operations as part of its Real Estate Rationalization initiative. The status of the initiative was reviewed and reported in the PUC's 2012 Management Efficiency Investigation Audit Report (D-2011-2265174), which reflected a potential annual savings if implemented of \$5 million due to increased productivity, reduced inventory and inventory handling costs, reduced travel time for the field crews and reduced operating and capital costs.

Although the Real Estate Optimization study was approved by both the PFMC and PGC, final approval has not yet been approved by the City. Because the original study was performed in 2008, the Company elected to update the study and issued a request for proposal in October 2014 to hire a consultant to conduct a strategic real estate rationalization analysis to effectively utilize PGW's real estate assets and to consolidate operations, with the goals of reducing operating costs and improving the Company's financial position. As of February 2015, PGW awarded the contract to a consultant to conduct such a review. While facility consolidation could yield substantial savings, there are offsetting implementation costs in the short term associated with the consolidation initiative. Operational improvements of this nature contemplated by PGW could yield substantial savings, which could allow PGW to provide better service to its customers and potentially dedicate more money into its pipeline replacement program.

VI. OTHER CONSIDERATIONS

Liquefied Natural Gas (LNG) Expansion

PGW operates two LNG facilities, Richmond and Passyunk, which provide peaking supply when customers' requirements exceed PGW's contracted delivery capabilities of pipeline and underground storage gas. Although PGW relies on the stored LNG to meet its projected design day demand, the LNG facilities do have unused or untapped capacity. PGW And City Council are currently exploring options to more fully utilize these facilities. These options could include expanding sales to new transportation markets, such as long-haul trucking fueling, Marcellus drilling pad fueling and marine and export applications.

In January 2015, PGW sought non-binding proposals for the purchase of LNG to better assess the potential market for LNG sales. In addition, Concentric Energy Advisors' Highest and Best Use Study (prepared for Philadelphia City Council and issued October 2014) included an analysis of the potential increased revenue from expanded LNG sales and upgrades needed to the LNG facility for optimization. Concentric concluded that PGW could "more than double its margins from off-system sales to the \$7.7 to \$10.0 million range, yielding a four- to eight-year payback period on the investment depending on the actual costs to construct the liquefaction expansion and the margin earned on LNG sales."⁸⁰ While the amount of the investment, payback period and anticipated net revenues of such expansion are unknown at this time, PGW should continue to explore such opportunities and analyze what potential value, if any, it will have for its regulated customers and its infrastructure improvement plans.

In addition, there may be other opportunities to leverage the LNG facility, such as public/private partnership, lease, sale, etc. These more hypothetical possibilities, since the facility is currently critical to serve PGW customers, introduce varying degrees of complexity. For example, the sale price of the LNG facility/ies would likely be influenced by the conditions surrounding the sale, such as commitments to continue to serve PGW, capacity rights/agreements, access restrictions, etc. Correspondingly, PGW would need a strategy to continue to serve its customers with partial or no control of its LNG facilities, which would likely result in the need for additional capacity. Therefore, any change in ownership, use or capabilities of the LNG facilities would need extensive study by PGW and corresponding due process proceedings by the governing bodies.

While additional investigation into LNG as a potential revenue source may be warranted, Staff notes that there also are risks associated with the LNG market. It should be noted that the Concentric Report, which cited the potential for increased LNG sales, was generated at a time of high crude oil prices. While LNG may have other advantages over oil

⁸⁰ *Concentric Energy Advisors' Highest and Best Use Study*, page V.

(i.e., cleaner burning fuel, more local distribution, etc.), price alternatives to LNG – like low crude oil cost – could likely affect demand for LNG. In addition, there are unregulated entities (i.e., non-utilities) that compete in the LNG market. These unregulated entities have different capital structures, regulatory requirements, etc. that may enable them to respond to market forces (i.e., capital upgrade) differently than traditional utility/municipal based organizations. Furthermore, depending how a private/public partnership, sale or lease is structured, risks of such a partnership to PGW and/or the City may reduce, modify, or eliminate the benefit of LNG sales by PGW since the new entity would need the unimpeded ability to earn a return on investment.

Pursue Strategic Alternatives

The City of Philadelphia enlisted Lazard Frères and Co. LLC (Lazard) to evaluate the City’s strategic options for PGW and, in February 2012, Lazard provided the following overview of structural alternatives: (1) enhance the status quo by retaining PGW’s current organizational structure but implementing potential improvements; (2) privatize through sale, entering into a public-private partnership or initial public offering; and, (3) enter into a Management Services Agreement where the City would retain ownership of PGW but enter into a contract with a third party.

Staff believes it is worthwhile for the City, the Company and City Council to explore the potential benefits of strategic partnership opportunities. For example, the Special Committee of City Council on Energy Opportunities for Philadelphia held its inaugural hearing on Friday, March 13, 2015, which heard testimony on the viability of public-private partnerships in Philadelphia, opportunities for expanding the role of PGW in Philadelphia’s energy future, best practices and proposals for energy-related public-private partnerships and possible legislative frameworks for future public-private partnership proposals.

Staff does not take a position as to whether any of the identified structural alternatives to PGW’s current organizational structure are appropriate for PGW and its customers. However, Staff maintains that it is worthwhile to continue to explore those alternatives to determine what, if any, impact it will have on PGW’s infrastructure improvement.

VII. CONCLUSION

Pennsylvania currently has the fourth-highest number of cast iron mains nationwide, and approximately half of that cast iron is located on PGW's system. In 2013, PGW had significantly more hazardous leaks and repaired more leaks than any other NGDC in the Commonwealth. Although PGW became more aggressive in 2014 with its infrastructure replacement, it will take 52.5 years to eliminate all cast iron and approximately 65.5 years to remove all at-risk cast iron and unprotected steel pipe at the 2014 rate.

PGW's LTIP indicates that cast iron will not be removed for 88 years. These replacement rates are not aggressive enough, especially considering that other large NGDCs plan to eliminate their cast iron in 13 to 22 years. PGW's cast iron and unprotected steel pipe are a threat to life and property; therefore, the Company must accelerate its infrastructure replacement and remove its at-risk pipe from service in a more aggressive manner than what is currently contemplated. Table 42 summarizes Staff's recommended opportunities for PGW to achieve this goal.

Finally, Staff would like to thank PGW for its cooperation in this matter by responding to numerous data requests and its willingness to engage in discussions concerning the financial, operational and safety components of its distribution system. Accelerating PGW's infrastructure replacement will require a coordinated effort between the Company, its local governing entities and the Commission. Continued cooperation will ensure that PGW has the necessary resources to provide "adequate, efficient, safe and reasonable service and facilities" to its 500,000 customers.⁸¹

⁸¹ 66 Pa. C.S. § 1501.

Table 42: Summary of Opportunities and Impacts

Opportunity		Potential Incremental Funds Available for Main Replacement ^a	Funds Guaranteed to be Used for Infrastructure Improvement?	Potential Reduction of Replacement Years from 2014 Levels ^b	Total Potential Replacement Timeframe (years) ^c	Impact on Customer Bills ^d	Challenges
1	Increase DSIC from 5%:						
	To 7.5%	Up to \$11 million annually	Yes	14.5	51.5	Low	Waiver required by PUC
	To 10%	Up to \$22 million annually	Yes	23.8	42.2	Medium	
	To 12%	Up to \$31 million annually	Yes	29.2	36.8	Medium	
2	Levelize and Annualize DSIC	Up to \$5 million annually	Yes	7.5	58.5	Low	
3	Issue New Debt	Potentially \$33 million annually	No	30.2	35.8	Lower initially; higher in future (see Table 39)	Increased financial leverage which may affect PGW's bond ratings and may increase borrowing costs
4	Improve Cash Management	Potentially \$25 million one-time	No	0.6	65.4	None	Less financial flexibility for PGW
5	Use Annual Payment to City	Up to \$18 million annually	No	20.5	45.5	None	Action required by City of Philadelphia
6	Streamline Governance	Up to \$800,000 annually	No	0.4	65.6	None	Action required by City of Philadelphia
7	Consolidate Facilities	Up to \$5 million annually	No	7.5	58.5	None	Unknown implementation costs

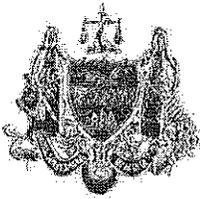
a: Potential dollars are calculated based upon various assumptions and are therefore an estimate of likely impact.

b: For illustrative purposes only. Reductions of replacement rates are not additive. The 2014 at-risk pipeline replacement timeframe is 66 years at a cost of \$1,314,051 per mile.

c: For illustrative purposes only. Replacement rates assume that: 2014 replacement efforts remain steady, costs to replace remain steady at 2014 costs, no inflation, all potential dollars from the opportunity are used for main replacement, etc.

d: Low = less than 2-percent increase in average total customer bill; Medium = between a 2- and 5-percent increase in average total customer bill; High = greater than 5-percent increase in average total customer bill.

APPENDIX A



CITY OF PHILADELPHIA
CITY COUNCIL
OFFICE OF THE PRESIDENT

DARRELL L. CLARKE
PRESIDENT
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COUNCILMAN - 5TH DISTRICT

To: Honorable Michael A. Nutter, Mayor

From: Philadelphia City Council

Date: October 27, 2014

Re: Proposed Sale of Philadelphia Gas Works - Recommendations and Next Steps

In March 2014, the City Administration presented City Council with a proposed Asset Purchase Agreement between the City of Philadelphia and UIL Holdings Corporation (UIL) for the sale of the Philadelphia Gas Works (PGW). Council has done its due diligence, including retaining an independent consultant, Concentric Energy Advisors, Inc., for two separate but related engagements: (1) act as City Council's financial advisor for its evaluation of the proposed sale; and (2) prepare a Highest and Best Use (HBU) study of PGW independent of the proposed sale. City Council has reviewed and evaluated Concentric's reports and the information made available by the Administration, UIL, PGW, and other stakeholders. City Council does not endorse the sale of PGW as proposed by the Administration. Instead, Council recommends that PGW and the City resolutely pursue the HBU opportunities outlined in Concentric's HBU Report as well as additional actions outlined in this memo.

Background

The proposed sale of PGW to UIL is the result of a Request for Proposal (RFP) process initiated by the City Administration. The Administration's decision to pursue a sale of PGW was informed by two reports performed by its advisor, Lazard Frères & Co. LLC (Lazard), which was retained to help evaluate the City's strategic options for PGW. Lazard identified and evaluated five management and ownership alternatives for PGW: (1) "enhanced" status quo; (2) strategic sale; (3) public-private partnership (PPP); (4) independent public offering (IPO); and (5) management services agreement; and recommended that the City pursue a strategic sale. Lazard noted that a successful privatization of PGW would require that the City develop a plan to build broad support from City Council, the City Administration, Commonwealth Offices, the Pennsylvania Public Utility Commission (PUC), and PGW Management and that "a privatization process should also incorporate a comprehensive strategy addressing the concerns/positions of each PGW stakeholder (e.g., ratepayers, City taxpayers, unions, PA PUC, Buyer, etc.)."

The Administration's RFP solicited proposals only for the sale of PGW. Specific proposals for any other alternatives were not sought by the City Administration nor did its process allow for the exploration of any of the above alternatives.

Overview

As part of Concentric's assessment of the proposed sale transaction, it reviewed a significant amount of materials, held meetings and interviews with various stakeholders, and performed independent analyses. In brief, Concentric concluded that the solicitation process was competitive, the proposed sale price reasonably reflected PGW's value, and the proposed transaction terms are generally customary. However, Concentric found that a number of considerations or objectives important to City Council and the public it represents were either not explicitly addressed by the Asset Purchase Agreement or that the provisions addressing them were limited in duration or scope. For example:

- Most employment-related conditions are linked to the expiration date of the current Collective Bargaining Agreement (CBA) on May 15, 2015, and the commitment to maintain at least 1,350 PGW employees is limited to three years;
- Rate-related commitments are dependent on PUC approval; there are no contractual commitments after the initial tariff filing for programs other than the Senior Citizen Discount; there is no contractual commitment to maintaining the low-income Customer Responsibility Program as it currently exists; and there are no specific commitments to continue the existing energy efficiency programs for low-income and other customers or the existing hardship fund (Utility Emergency Services Fund);
- UIL has only committed to a three-year base rate freeze, subject to certain exceptions. Base rates account for about 50% of customer bills, and the proposed agreement allows bills to increase through other mechanisms, i.e., automatic rate adjustment riders, charges, and surcharges;
- There is no restriction on UIL's right to dispose of all or some of PGW's assets at any time;
- The sale agreement does not require UIL to provide an Economic Opportunity Plan until after the transaction closes;
- The proposed agreement does not preclude UIL from either foreclosing on PGW liens for unpaid gas bills or selling those liens to a third party for collection/enforcement;
- There is no commitment by UIL to maintain a local presence beyond its guarantee to keep PGW headquarters in Philadelphia for three years;
- PGW employees would no longer be required to be City residents;
- Local government oversight of PGW and control of its spending priorities (which directly impact its rates) will be greatly diminished if the sale is approved; and
- Potential acceleration of the cast iron main replacement program is unaddressed.

The Administration stated that the net proceeds of the transaction would be in the range of \$400 million to \$600 million. However, the permanent loss of PGW's annual \$18 million City payment (which was valued by Concentric to be in the range of \$170 million to \$200 million) would reduce the net benefit to

\$200 million to \$400 million.

When this reduced net benefit is weighed against the additional short-term and long-term, direct and indirect costs associated with the factors listed above, the actual benefit to the City of the proposed sale is further diminished.

Concentric advised that, in determining whether the proposed sale of PGW is better for the citizens of Philadelphia than continued ownership now and for the future, Council should consider the myriad of financial, employment, rate, public policy, economic development, and social considerations as well as the programs and functions that PGW provides as a City-owned utility. Having done so, Council has determined that the sale as proposed by the Administration would not be better for the citizens of Philadelphia than continued ownership by the City.

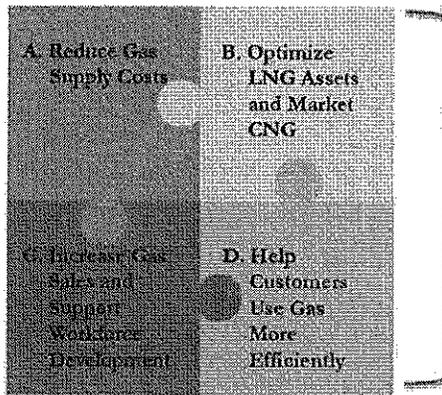
Highest and Best Use Study

The assessment of the “highest and best use” of PGW examines the potential and credible use of PGW’s assets to increase their value for its customers, owner, employees, and the citizens of Philadelphia. Concentric identified six specific opportunities for PGW to contribute to the City of Philadelphia’s economic growth and public welfare, while enhancing its own financial strength. Significantly, all of these opportunities derive from PGW’s core gas business: the sale and delivery of natural gas and related products and programs that help customers use less energy. PGW is already engaged in several of these activities and Concentric proposed that it either continue or expand these efforts. While the opportunities can be considered individually or in subsets, Concentric crafted them as an integrated collection that can work together to achieve the following goals:

- Minimize PGW’s gas supply and delivery costs over the long-run;
- Contribute to Philadelphia’s economy by retention and attraction of businesses and by providing employment opportunities to its citizens;
- Grow top-line and net revenues from traditional regulated services and emerging competitive market opportunities to enhance PGW’s financial position;
- Increase energy efficiency of PGW customers in the near term, and improve the efficiency of buildings in Philadelphia over the long-run; and
- Support Philadelphia’s economic and social policy goals.

The six opportunities are summarized in the following figure from Concentric's HBU Report.

PGW Opportunities



PGW's Customers:

- Lower gas bills from PGW cost savings, increased throughput, efficiency gains, and margins from sales of LNG to regional businesses

Philadelphia:

- More affordable gas service
- Economic growth
- More efficient infrastructure

PGW:

- Stronger financially

Six HBU Opportunities => \$27 - \$33 Million/Year for PGW

- | | |
|---|---|
| <p>A. ① Diversify the Gas Supply Portfolio</p> <p>④ Pursue CHP, Help Businesses Grow and Convert Customers to Gas</p> | <p>B. ② Optimize LNG Assets</p> <p>③ Support Development of a Regional NGV Market</p> |
| <p>C. ⑤ Support Energy Industry Workforce Training Programs</p> | <p>D. ⑥ Invest in Customer Premises to Lower Energy Bills</p> |

Council's Recommended Next Steps

This section of this memorandum will rely and build on the findings of the HBU Report.

A. Implement the Six HBU Opportunities

PGW needs to be actively involved in the development and execution of implementation plans for the HBU opportunities in order for them to be successful. To implement certain opportunities, PGW may require the services of outside firms.

1) Diversify PGW's Gas Supply Portfolio: PGW currently purchases all of its gas from Gulf Coast sources despite the fact that Philadelphia is located very close to the Marcellus – the largest source of natural gas in the country. Shifting a portion of PGW's existing direct supply from the Gulf to the Marcellus is perhaps the biggest opportunity for PGW and can potentially generate at least \$17 million in savings. Every PGW customer will benefit from lower gas supply costs, including the City's largest industrial customers that buy their own gas in the Philadelphia area and rely on PGW to deliver it to their facilities. Several companies are interested in building new pipelines to deliver relatively low-cost natural gas from the Marcellus to markets. They need

customer commitments in order to finance their projects. PGW is a large enough “anchor” customer to give some pipeline projects a development advantage over others.

Recommended Actions:

- (1) PGW management should update the City Administration and Council on any discussions it has had with developers that are interested in building pipelines that will deliver natural gas to Philadelphia or nearby markets; and
- (2) PGW’s gas supply team should report to the Administration and Council regarding the potential for and net benefits of terminating and/or renegotiating existing PGW pipeline transportation contracts and replacing them with contracts with potential new pipelines.

2) Optimize PGW’s Liquid Natural Gas (LNG) Assets: PGW (whether municipally or privately owned) is not currently positioned to compete in the LNG export business for several reasons, but can expand sales to new LNG transportation markets by adding liquefaction capacity at its Richmond LNG facility which has one of the largest storage tanks in the Northeast. This facility can meet the needs of PGW’s sales customers during extended stretches of cold weather but lacks adequate liquefaction capacity to support an increase in sales to transportation markets. PGW is already considering making this capital investment. Similar to PGW’s preliminary estimates, Concentric estimated an investment of approximately \$50 million would be required but could have a payback in the 4 to 8 year range based on new net revenues of \$8 million to \$10 million per year. PGW is strong enough financially to consider doing this alone but might also consider doing this with a private partner.

Recommended Actions:

- (1) PGW should develop a more detailed site-specific design study and firm up the estimated capital costs;
- (2) PGW should confirm the strength of the emerging markets and its competitive position; and
- (3) PGW and the City should address any legal issues associated with a public-private partnership (PPP), assuming that this is an option that PGW would like to consider.

3) Support Development of a Regional Natural Gas Vehicle (NGV) Market: PGW has recently acquired 24 Compressed Natural Gas (CNG) sedans in an effort to spur the growth of a local NGV market.¹ Several local businesses are considering converting their fleets to CNG. The City owns other vehicles that can be converted or replaced with natural gas vehicles. NGVs do not travel as far on a tank of gas as gasoline vehicles, making them ideally suited for urban use. But it is difficult to market to privately owned fleets without more refueling stations and the refueling stations require a market to make them financially viable. PGW is currently focused on increasing throughput by providing natural gas sales and transportation service at high pressures to public and private refueling stations that decide to locate within Philadelphia. PGW has retained a consultant (Gladstein, Neandross & Associates) that has been evaluating the business opportunities.

Recommended Actions:

- (1) PGW and/or its consultant should develop the first draft of an implementation plan; and
- (2) The City should work with PGW to maximize the potential for siting additional CNG fueling stations in Philadelphia, including linking these to potential conversion of City and other fleet vehicles.

4) Pursue CHP, Help Businesses Grow, and Convert Customers to Gas: While PGW serves a large proportion of the City's homes and businesses, there are still opportunities for PGW to sell more natural gas to Philadelphia businesses by working with firms that are considering relocating to or expanding within the City. We need to foster an environment in which the public sector and the business community view PGW as a vital partner. One of the most exciting opportunities is to take advantage of a technology that allows large customers to save on their electricity bills while efficiently generating energy to meet heating and cooling needs. This is called combined heat and power or CHP. PGW has already installed CHP at its headquarters, the Four Seasons Hotel, and at a few apartment and office buildings in Philadelphia. PGW is marketing CHP aggressively to many of the City's largest energy users – who are also among the City's largest employers.

Recommended Actions:

- (1) PGW should continue its aggressive marketing efforts of CHP; and
- (2) The Administration should coordinate the engagement of City agencies and community business leaders with PGW in order to develop a more unified approach to attracting new businesses to Philadelphia and to helping existing businesses expand.

¹ There are approximately 20 CNG refueling stations in Pennsylvania that are open to the public, including five in the Philadelphia area and one in the City.

5) Support Energy Industry Workforce Training Programs: As PGW begins to work more closely with other City agencies and the business community, there is an important role that PGW can serve to support the development of more natural gas industry and related jobs in the City by working with Philadelphia's education institutions and business community to help train City residents. There are opportunities for Philadelphia to help businesses decide to locate in the City, particularly businesses that depend on low natural gas prices. These businesses will need a trained workforce, a key driver in their location and expansion decisions.

Recommended Actions:

- (1) Council, the Administration, and other stakeholders (e.g., organized labor) should identify educational institutions, business organizations and large employers that may be interested in participating in the development of workforce training programs within Philadelphia; and
- (2) PGW can contribute to this by partnering with other Philadelphia businesses, the City, organized labor and educational institutions (high schools and universities) to design training programs to meet these needs and to connect Philadelphia workers to the jobs.

6) Invest in Customer Premises to Lower Energy Bills: It is particularly important that PGW help participants in its Customer Responsibility Program (CRP) use natural gas more efficiently, because the costs of this program are borne by all other PGW customers. While many of PGW's energy efficiency programs are targeted to this group of customers, PGW's efforts to improve the delivery, economics, and overall success of the program have been limited by challenges in the delivery of energy efficiency services to this customer segment, including high participation refusal rates (by customers or their landlords) and properties that require structural improvements in order for efficiency measures to be installed. PGW has been aggressively pursuing efforts to improve CRP, including the delivery of energy efficiency programs. A November 2012 report prepared by APPRISE made several recommendations that are being implemented by PGW that focus on customer participation, payment crediting and quality control.² Among other program changes recently approved by the PUC, PGW will implement a \$100 credit to reward CRP customers that achieve efficiency targets. The benefits of more efficient use of natural gas by CRP customers accrue directly to PGW's other customers, in the form of lower bills, in turn improving PGW's financial condition by reducing receivables. At the same time, an effort should be made to spend up to the budget for energy efficiency programs that target business customers. City Council has already mandated energy efficiency benchmarking for large commercial buildings (Bill No. 120428-A). This benchmarking data should generate interest in retrofit investments among PGW's commercial and industrial customers. PGW's current portfolio of energy efficiency programs will expire as of August 31, 2015, if not reauthorized by the PUC.

² "PGW Universal Service Program Impact Evaluation Final Report," November 2012, prepared by Applied Public Policy Research Institute for Study and Evaluation (APPRISE).

Recommended Actions:

- (1) PGW should promptly file its proposal to the PUC to reauthorize its EnergySense programs (including the low-income customer energy efficiency programs) for another five years;
- (2) PGW should redouble its efforts to increase the effectiveness of energy efficiency programs targeted to the low-income customer segment; and
- (3) PGW should increase its marketing efforts associated with these programs.

B. Enhance the Decision-Making and Operations of PGW

The HBU Report noted that the fortunes of PGW and the City are inseparable to a degree that is unusual for a gas company and the communities it serves, starting with the fact that PGW serves only one city. A stronger PGW will be able to increase investment in the distribution network and provide new services to Philadelphia's businesses and citizens. To the extent that PGW can lower its costs of acquiring gas supply or make a profit by selling surplus LNG, this lowers the rates paid by all customers including businesses that can redirect savings to invest in their firms.

While not the focus of Concentric's two reports, Council recognizes that, in order to move PGW forward to achieve its HBU potential in an efficient and effective way, the City needs to take additional actions. First, we can and should modernize the current local governance structure. Council also believes that PGW can and should further accelerate its cast iron main replacement program, while continuing to achieve efficiencies in its operations.

- 1) **Modernize PGW's Governance:** While private corporations, including utilities, face their own governance challenges, their decision-making processes are more streamlined and project greater clarity for all stakeholders. The current local governance structure involves multiple entities including the Mayor and City Administration, City Council, the City Controller, the Philadelphia Gas Commission, as well as the Philadelphia Facilities Management Corporation (whose Board is appointed by the Mayor). While this structure was put in place to ensure that the fiduciary and other interests of the City (as owner) were appropriately protected, it should not be so cumbersome as to disadvantage PGW in competing with privately-owned companies in emerging natural gas markets which often require faster decision-making. In recent years, Council, the Administration, the Law Department, the Gas Commission, PGW and the Public Advocate successfully collaborated to respond to changing market conditions affecting PGW's procurement of gas supply (e.g., Bill No. 110109). This same approach could be used to explore other possible structural changes.

Recommended Action:

(1) The Administration and Council should take appropriate actions to enable PGW to operate “more like a business” to facilitate its increased participation in LNG, CNG and other new markets, while at the same time preserving the necessary accountability to its owners – the citizens of Philadelphia – and protecting the City and PGW from unnecessary business risks.

- 2) **Further Accelerate Main Replacement:** PGW faces a multi-decade challenge to replace its 1,501 miles of cast iron main as fast as is practically and financially feasible. Pursuant to its initial five-year Long Term Infrastructure Improvement Plan approved by the PUC in conjunction with approval of PGW’s Distribution System Improvement Charge (DSIC), and consistent with its capital budgets approved by City Council, PGW has recently increased the number of miles of cast iron main it replaces each year from 18 to 25. In FY 2014 PGW spent about \$38 million on cast iron main replacement and another \$17 million on the related replacement of services (about 70% of PGW’s services are now plastic). PGW’s replacement program is based on a sophisticated prioritization model that reflects the most recent break, leak and incident experience associated with different categories of cast iron mains and the resulting impacts on the risk profile. PGW’s accelerated replacement program will eliminate all 12-inch and 30-inch high pressure cast iron main within the next 10 years and all of its 8-inch & smaller low or intermediate pressure cast iron main within the next 50 years. But, PGW projects it will take an additional 20 to 30 years to replace the other 20% of its cast iron main inventory. PGW does not plan to replace other pipe (ductile iron and unprotected coated steel) assessed by PGW as presenting a lower risk until all cast iron main has been removed. It remains to be determined how much pipe PGW can safely and efficiently replace from a practical perspective taking into account operational requirements.

Council believes that it is feasible for PGW to further accelerate the pace of pipe replacement without unduly burdening customers or commerce in the City. If PGW’s DSIC were increased from 5% of distribution revenues to the 7.5% permitted by state law, an additional \$12 million per year could be generated to support these efforts. This would add about \$2 per month to typical customer bills but would allow PGW to further accelerate replacement of its small diameter mains by about 20 years. This would also create additional construction and paving work for contractors who currently supplement PGW’s workforce.

Recommended Actions:

- (1) PGW should immediately prepare a plan to further accelerate its cast iron main replacement efforts based on additional annual spending of about \$12 million, and submit the related capital budget to Council for approval; and
(2) Upon Council’s budgetary approval, PGW should submit a petition to the PUC to increase the DSIC to 7.5% of distribution revenues.

- 3) **Continue Operational Efficiencies:** PGW's operational and financial progress, particularly during the past five to 10 years, culminated in the recent upgrade of its bond credit ratings by Standard & Poor's (S&P) to A-. As S&P observed in its October 21, 2014 ratings analysis, the upgrade reflected its "view of improving trends related to collections, coverage of fixed costs, liquidity and debt ratios for PGW, as well as the adoption of a number of credit supportive policies and procedures." PGW's improved operations and upgraded bond ratings are built upon the ongoing collaborative efforts of management and all segments of PGW's workforce. These measures have enabled PGW to do more pipe replacement, system leak surveys, meter change-outs and other field operations with the same or reduced numbers of personnel, while maintaining a stellar record of responding to gas odor calls well within the targeted 60 minute response time. PGW has attained other productivity, efficiency and financial goals through business transformation initiatives which automated collections processes, targeted and refined collections efforts, and utilized more flexible deployment of personnel to address seasonal workload variations. PGW is now nearing completion of a state-of-the-art Data Center housing its computer systems, which will meet its growing information technology needs while reducing the associated operating costs. Other potential business initiatives have been put on hold by the Administration because of its sale process. Potential untapped opportunities now need to be explored and appropriate action plans developed. This includes such possibilities as consolidating PGW's real estate footprint. PGW has already made changes in pension and other employment benefits, but to maintain and improve its stable financial condition, management and labor should continue to explore and identify other possible enhancements. PGW has recently forecasted the need for an additional \$40 million in revenues beginning in FY 2018, to be generated by a base rate increase, growth in top line revenues, cost reductions, or some combination thereof. Council views the collaborative pursuit of additional productivity enhancements and cost reductions to be an important adjunct to the potential \$27 million to \$33 million or more in annual revenue enhancements associated with the HBU opportunities, which together offer the opportunity to defer or reduce the need for future base rate increases.

Recommended Action:

(1) PGW should identify in its FY 2016 Operating and Capital Budgets a specific proposal for, and estimated cost reductions associated with, attaining additional operating efficiencies during the next five years.

-End-

APPENDIX B

Philadelphia Gas Works

Douglas A. Moser
EVP and Acting Chief Operating Officer



800 W. Montgomery Avenue, Philadelphia, PA 19122
Telephone: (215) 684-6899
Email: Douglas.Moser@pgworks.com

March 20, 2015

Honorable Marian B. Tasco
Chairwoman
Philadelphia Gas Commission
1515 Arch Street
Philadelphia, Pennsylvania 19102

RE: FY 2016 Capital Budget and Forecast for FY 2017-FY 2021

Dear Chairwoman Tasco:

PGW filed its FY 2016 Capital Budget and Five Year Forecast for FY 2017 through FY 2021 on January 2, 2015. In the transmittal letter accompanying the budget submission, it was noted that PGW was unable to finalize its plan to address Council President Clarke's request for PGW to further accelerate PGW's Cast Iron Main Replacement ("CIMR") Program. It was PGW's belief that prior to developing an accelerated plan for main replacement a number of critical issues needed attention. PGW needed to determine impact on customer rates, the stability of PGW's long-term financial position, the availability of resources, both internal and external, the disruption to local commerce, the future projection of cast iron main inventory and the associated decrease in risk.

Since the budget filing PGW, in conjunction with the PFMC Board of Directors, engaged in a process to evaluate alternatives to prudently increase PGW's CIMR Program. Through this process, PGW was able to identify an optimal replacement strategy that could be implemented to enhance the safety performance of PGW's underground distribution infrastructure. However, adoption of this alternative requires PGW to amend the original capital budget filing to provide the necessary budget authorization. Attached is a resolution from the PFMC Board of Directors approving PGW's request to increase its CIMR Program.

PGW's proposal is to implement an \$11.0 million, cost-based accelerated CIMR Program which will be phased in over a two year period, taking into consideration the time to mobilizes the required resources to meet the demands of this program. Considering this mobilization period, PGW is requesting an initial increase in the budget category captioned "Long Term Infrastructure Plan – Accelerated Cast Iron (#52-21-2-03)" in the amount of \$5.5 million, with this line item increasing to \$11 million for each year of the five year forecast period. PGW proposes to fund this additional investment by seeking approval from the Pennsylvania Public Utility Commission ("PA PUC") for an updated Long Term Infrastructure Improvement Plan ("LTIIP") and a corresponding increase in the Distribution System Improvement Charge ("DSIC") from 5% to 7.5% to fund this increase in expenditures. (See attached Capital Proposal Form for Main Replacement).

It should be noted that PGW's proposed CIMR program is funded under a budget category classified under "D-21, Gas Mains – Low and Intermediate Pressure – 8 Inch and Smaller". However, this funding authorization may be utilized to fund other cast iron main sizes as may be identified from the updating of PGW's Cast Iron Main Replacement Study or from other conditions experienced in the field.

Coincident with the increase in CIMR, the FY 2016 Capital Budget, as well as the Five Year Forecast, needs to be amended to reflect the costs to install more services to support the increase in main replacement, additional authorization of \$1,639,000 in FY 2016 and \$3,600,000 for the forecast period is requested. In addition, the Fleet Operations budget will be adjusted to reflect the costs of \$861,000 to provide additional truck and compressor units in FY 2016 to support this increased work effort. (See Capital Proposal Form for service replacements and fleet requirements).

In summary, PGW and PFMC believe the amendment proposed to increase PGW's CIMR Program strikes the appropriate balance between safety, cost-effectiveness, capacity, and affordability. The course of action identified in this amendment will help to counter the concerns raised recently regarding PGW's distribution infrastructure. By investing these funds to make a safe system even safer, our customers will be reassured that natural gas service continues to be a safe option.

Specific details regarding DBE opportunities and PGW's Finance Plan resulting from the proposed budget amendment request are in the process of being developed and will be forward upon completion. Also attached is a copy of the PFMC resolution approving PGW's filing of this amendment request.

I recognize the Gas Commission staff is well along their review of PGW's originally filed budget and the submission of this budget amendment requires a thorough review prior to rendering a recommendation to City Council. However, PGW would appreciate if the review of this amendment request can be completed in a timeframe which coincides with the current budget review process and allows for City Council approval prior to their recess. I can assure you of PGW's commitment to support the review of this budget and forecast amendment in an expeditious manner.

Thank you for your consideration of this request and if I can be of further assistance, please let me know.

Sincerely,



Douglas A. Moser
EVP and Acting Chief Operating Officer

Attachments

cc: All Gas Commissioners
Service List – FY 2016 Capital Budget

RESOLUTION
APPROVAL TO AMEND THE FY 2016 CAPITAL BUDGET AND
FY 2017-2021 CAPITAL FORECAST FILING

I, **ABBY L. POZEFSKY**, Assistant Secretary of **PHILADELPHIA FACILITIES MANAGEMENT CORPORATION**, do hereby certify that the following is a true and correct copy of action taken by the Board of Directors of said corporation by unanimous consent to the adoption of this resolution dated March 20, 2015, pursuant to provisions of Section 5727(b) of the Non-Profit Corporation Law of the Commonwealth of Pennsylvania.

WHEREAS, pursuant to that certain Management Agreement by and between the Philadelphia Facilities Management Corporation ("PFMC") and the City of Philadelphia dated December 29, 1972, as amended, PFMC is the manager and operator of the Philadelphia Gas Works ("PGW");

WHEREAS, PFMC previously approved PGW's proposed FY 2016 Capital Budget in the gross amount of One Hundred Eighty-One Million, Six Hundred and Two Thousand Dollars (\$181,602,000) and a FY 2017-2021 Capital Forecast of Four Hundred and Eighty-Four Million, Six Hundred and Twenty Nine Thousand Dollars (\$484,629,000);

WHEREAS, PFMC previously approved PGW's request to include in the FY 2016 Capital Budget the reauthorization of additional spending for certain FY 2014 capital projects whose lifespan could expire on August 31, 2015 without completion of the project. The reauthorization would allow completion of these projects within the spending limits established in the FY 2014 Capital Budget. These projects where reauthorization is requested include the following: Replace PBX With Voice Over IP Phone System (#47-01-2-04)(\$2,838,000); SCADA Upgrade With Control Room and Alarm Management (#09-01-2-01)(\$1,188,000); Replace Gas Management System and Supplier Choice Software (#57-01-2-01)(\$1,159,000); and Consolidated Billing and Purchase of Receivables (#10-01-1-01)(\$1,523,000);

WHEREAS, the budget authorization sought in the previously approved request included funding to support the implementation of PGW's Long Term Infrastructure Improvement Program ("LTIIP") at a level that reflects PGW's historical baseline 18 mile replacement program, supplemented by an accelerated program approved by the Pennsylvania Public Utility Commission ("PA PUC") and funded through a 5% Distribution System Improvement Charge ("DSIC);

WHEREAS, PGW, during its deliberation with the Board regarding the capital budget, indicated that stakeholder attention continued on the issue of Cast Iron Main Replacement ("CIMR"), as the President of City Council communicated to the Board Chairman the need to develop a plan to further

accelerate main replacement as part of the FY 2016 Capital Budget and related five year forecast, while the Chairman of the PA PUC has directed his staff to conduct an inquiry and analysis of PGW's pipeline replacement program, including the need for, and any impediments to, the expansion of the program to protect the public interest;

WHEREAS, PGW Management at the time of the capital budget review reached the conclusion that alternatives to increase CIMR needed to identify the optimal request before seeking further approval, as well as address specific issues that impacted program implementation;

WHEREAS, PGW filed a request to the Philadelphia Gas Commission ("PGC") on January 2, 2015 seeking a positive recommendation to City Council, the PGC's review process is underway and the PGC is scheduled to render a recommended decision to City Council by the end of April 2015;

WHEREAS, PGW has completed its review of its CIMR program and has determined an expansion of this program is warranted and request the Board approve an amendment to the FY 2016 Capital Budget reflecting a corresponding increase in budget authorization;

WHEREAS, PGW has determined a revised cost-based CIMR program funded in the amount of an additional Eleven Million Dollars (\$11,000,000) annually is warranted and in the best interest of its customers and further recommends that full implementation of the program be staged over a two year period to allow for anticipated mobilization of resources (See Exhibit A for specific incremental authorization for CIMR);

WHEREAS, this increase in CIMR will result in additional authorization for service replacements and incremental fleet requirements to support the revised CIMR consistent with planned expenditures set forth in Exhibit A;

WHEREAS, PGW proposes to seek approval from the PA PUC to modify PGW's LTIP to reflect the increase in CIMR and to further seek approval of an increase in PGW's DSIC from the current 5% level to 7.5%, and if the PA PUC action is different than requested PGW will return to the Board for further direction;

WHEREAS, the Board has reviewed and approved PGW's plan to increase PGW's CIMR program and the subsequent increase in the FY 2016 Capital Budget;

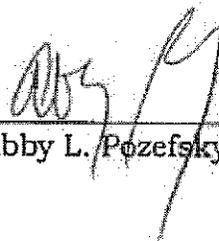
NOW, THEREFORE, BE IT RESOLVED, that the PFMC Board of Directors approves PGW's request to amend the filed FY 2016 Capital Budget with an increase in the gross amount of Eight Million Dollars (\$8,000,000) and all expenditures to be made thereunder, and amend the FY 2017-2021

Capital Budget Forecast in the gross amount of Seventy-Three Million Dollars (\$73,000,000) proposed by management and authorizes the filing to amend the FY 2016 Capital Budget and the FY 2017 thru FY 2021 Forecast with the Philadelphia Gas Commission.

IN WITNESS WHEREOF, I have hereunto set my hand and have caused the corporate seal of said Corporation to be hereunto affixed this 20th day of March 2015.

PHILADELPHIA FACILITIES
MANAGEMENT CORPORATION

By: _____


Abby L. Pozefsky

**PHILADELPHIA GAS WORKS
FY 2016 CAPITAL BUDGET AMENDMENT
INCREMENTAL INCREASE**

Budget Category	Description	DSCI	2016	2017	2018	2019	2020	2021	Exhibit A
Distribution Department									
52-21-2-03	Long Term Infrastructure Plan - Accelerate Cast Iron Main	Yes	\$ 5,500,000	\$ 11,000,000	\$ 11,000,000	\$ 11,000,000	\$ 11,000,000	\$ 11,000,000	\$ 60,500,000
52-24-2-01	Service Renewal - Small Diameter 1-1/4" and Smaller Services	No	\$ 1,639,000	\$ 3,600,000	\$ 3,600,000	\$ 3,600,000	\$ 3,600,000	\$ 3,600,000	\$ 19,639,000
	Total Distribution		\$ 7,139,000	\$ 14,600,000	\$ 80,139,000				
Fleet Operations									
73-01-1-02	Mobile Equipment Additions	No	\$ 118,000						\$ 118,000
73-01-1-03	Vehicle Additions	No	\$ 743,000						\$ 743,000
	Total Fleet Operations		\$ 861,000	\$ -	\$ 861,000				
	TOTAL INCREASE		\$ 8,000,000	\$ 14,600,000	\$ 81,000,000				

CAPITAL PROGRAM PROPOSAL YEAR 2016

DEPARTMENT: Distribution

ADDITION REPLACEMENT

DIVISION:

BUDGET CATEGORY: 52-21-2-03 Incremental

PRIORITY:

1 SAFETY 3 ENFORCED RELOCATIONS 5 BUSINESS IMPROVEMENT
 2 RELIABILITY 4 LOAD GROWTH

DESCRIPTION OF PROPOSED PROJECT:

Long Term Infrastructure Improvement Plan - Accelerated Cast Iron

LOCATION:

Various

NEED FOR PROJECT:

Accelerated Cast Iron pipe replacement

ESTIMATE OF COST (In Thousands)		MONTHLY EXPENDITURE FOR BUDGET YEAR (In Thousands)		ESTIMATED TIMING & EXPENDITURE SCHEDULE (In Thousands)	
PGW LABOR	\$ -	SEP	\$ 458	BUDGET YEAR	\$ 5,500
MATERIAL	-	OCT	458	FORECAST YEARS	
PURCHASED SERVICES	-	NOV	458	YEAR 1	
IS HARDWARE	-	DEC	458	YEAR 2	
IS SOFTWARE	-	JAN	458	YEAR 3	
OTHER	-	FEB	458	TOTAL	\$ 5,500
PROJECT COST	\$ -	MAR	458	SUBMITTED BY DEPARTMENT MANAGER/DIRECTOR	
ADMIN & GENERAL	-	APR	458		
13.61% OF PROJECT	-	MAY	459	APPROVED BY VICE PRESIDENT OR SENIOR VICE PRESIDENT	
SUB TOTAL	\$ -	JUN	459		
AFUDC _____ OF SUBTOTAL	-	JUL	459	APPROVED BY EXECUTIVE VICE PRESIDENT & CHIEF OPER. OFFICER	
TOTAL CAPITAL COST	\$ 5,500	AUG	459		
ESTIMATED BY: <u>Finance/Distribution</u>		TOTAL	\$ 5,500	APPROVED BY PRESIDENT AND CEO	
DATE: <u>03/20/15</u>					

CAPITAL PROJECT
BUDGET JUSTIFICATION

Department: **Distribution Department**

Fiscal Year: **2016**

Project Title: **Long Term Infrastructure Improvement Plan- Accelerated Cast Iron
Main Replacement D-21 (52-21-2-03) Incremental**

Estimated Cost: **\$5,500,000**

Type of Project:	Addition	_____
	Replacement	_____ X _____
Basis of Justification:	Safety	_____ X _____
	Reliability	_____
	Improved Efficiency	_____
	Enforced Relocation	_____
	Business Improvement	_____ X _____

Justification - Attach the following information for each project.

1. **Detailed explanation of project.**
 Budget request is to provide funds for the Long Term Infrastructure Improvement Plan – Accelerated Cast Iron Main Replacement.
2. **Identify consequences of not doing this project.**
2. **Economic analysis using simple payback method.**
4. **If economic analysis cannot justify the project, provide justification for why the project is required, i.e. code or regulatory requirement (state specific code/regulation), safety (provide specific historical data to explain the current condition) etc.**
5. **Identify options/alternatives for this project.**

CAPITAL PROGRAM PROPOSAL YEAR 2016 <input type="checkbox"/> ADDITION <input checked="" type="checkbox"/> REPLACEMENT	DEPARTMENT: Distribution DIVISION: BUDGET CATEGORY: 52-24-2-01 Incremental
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PRIORITY:

1 SAFETY 3 ENFORCED RELOCATIONS 5 BUSINESS IMPROVEMENT

2 RELIABILITY 4 LOAD GROWTH

DESCRIPTION OF PROPOSED PROJECT: Renewal of 1 1/4" and smaller services.

LOCATION: Unspecified.

NEED FOR PROJECT: To renew services for leaks, with main replacements, for customer complaints and City and State work.

ESTIMATE OF COST (In Thousands)	MONTHLY EXPENDITURE FOR BUDGET YEAR (In Thousands)	ESTIMATED TIMING & EXPENDITURE SCHEDULE (In Thousands)
PGW LABOR \$ 1,155		BUDGET YEAR \$ 1,639
MATERIAL <u> 130</u>		FORECAST YEARS
PURCHASED SERVICES <u> 14</u>	SEP \$ 137	YEAR 1 _____
IS HARDWARE <u> -</u>	OCT <u> 137</u>	YEAR 2 _____
IS SOFTWARE <u> -</u>	NOV <u> 137</u>	YEAR 3 _____
OTHER <u> 144</u>	DEC <u> 137</u>	TOTAL \$ 1,639
PROJECT COST \$ 1,443	JAN <u> 137</u>	
ADMIN & GENERAL	FEB <u> 137</u>	
13.61% OF PROJECT <u> 196</u>	MAR <u> 137</u>	SUBMITTED BY DEPARTMENT MANAGER/DIRECTOR
SUB TOTAL \$ 1,639	APR <u> 137</u>	
AFUDC _____ OF SUBTOTAL <u> -</u>	MAY <u> 137</u>	APPROVED BY VICE PRESIDENT OR SENIOR VICE PRESIDENT
TOTAL CAPITAL COST \$ 1,639	JUN <u> 137</u>	
	JUL <u> 137</u>	APPROVED BY EXECUTIVE VICE PRESIDENT & CHIEF OPER. OFFICER
ESTIMATED BY: <u>Finance/Distribution</u>	AUG <u> 132</u>	
DATE: <u>03/20/15</u>	TOTAL \$ 1,639	APPROVED BY PRESIDENT AND CEO

CAPITAL PROJECT
BUDGET JUSTIFICATION

Department: **Distribution Department**
Fiscal Year: **2016**
Project Title: **Renewal of 1 1/4" & Smaller Service D-24 (52-24-2-01) Incremental**
Estimated Cost: **\$1,639,000**

Type of Project:	Addition	<u> </u>
	Replacement	<u> X </u>
Basis of Justification:	Safety	<u> X </u>
	Reliability	<u> </u>
	Improved Efficiency	<u> </u>
	Enforced Relocation	<u> </u>
	Revenue Producing	<u> </u>

Justification - Attach the following information for each project.

1. **Detailed explanation of project.**
Budget request is to provide funds for renewing 1 1/4" & smaller services in support of PGW's accelerated cast iron main replacement program.

2. **Identify consequences of not doing this project.**
Failure to replace will result in increasing risk to the distribution system.

2. **Economic analysis using simple payback method.**
No economic justification required for safety.

4. **If economic analysis cannot justify the project, provide justification for why the project is required, i.e. code or regulatory requirement (state specific code/regulation), safety (provide specific historical data to explain the current condition) etc.**

5. **Identify options/alternatives for this project.**
Don't replace facilities and continue to repair facilities/system which over time decreases the integrity of the system.

CAPITAL PROJECT
BUDGET JUSTIFICATION

Department: Fleet Operations
Fiscal Year: 2016
Project Title: Mobile Equipment Additions
Estimated Cost: \$118,000

Type of Project:	Addition	<u> X </u>
	Replacement	<u> </u>
Basis of Justification:	Safety	<u> X </u>
	Reliability	<u> </u>
	Improved Efficiency	<u> </u>
	Enforced Relocation	<u> </u>
	Business Improvement	<u> X </u>

Justification - Attach the following information for each project.

1. Detailed explanation of project.
The equipment items targeted for addition are to support the replacement of cast iron main.
2. Identify consequences of not doing this project.
2. Economic analysis using simple payback method.
No economic justification required for safety.
4. If economic analysis cannot justify the project, provide justification for why the project is required, i.e. code or regulatory requirement (state specific code/regulation), safety (provide specific historical data to explain the current condition) etc.
5. Identify options/alternatives for this project.

EXHIBIT 3

CAPITAL PROGRAM PROPOSAL YEAR 2016 <input checked="" type="checkbox"/> ADDITION <input type="checkbox"/> REPLACEMENT	DEPARTMENT <u>Fleet Operations</u> BUDGET CATEGORY <u>73-01-1-01</u>
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PRIORITY:

1 SAFETY 3 ENFORCED RELOCATIONS 5 BUSINESS IMPROVEMENT

2 RELIABILITY 4 LOAD GROWTH

DESCRIPTION OF PROPOSED PROJECT: Acquire additional vehicles to support the replacement of cast iron main:

<u>3- Walk-Ins @ \$105,450 each = \$316,350</u>	<u>1- Stake Body/Platform Truck @ \$119,000 each = \$119,000</u>
<u>2-FSD Vans @ 31,296 each = \$62,592</u>	<u>11-Sedans @ \$22,267 each = \$244,933</u>

LOCATION: _____

NEED FOR PROJECT: To provide additional capacity to support the replacement of cast iron main.

ASSET RETIREMENT INFORMATION: _____

ESTIMATE OF COST (In Thousands)	MONTHLY EXPENDITURE FOR BUDGET YEAR (In Thousands)	ESTIMATED TIMING & EXPENDITURE SCHEDULE (In Thousands)
PGW LABOR \$ _____		BUDGET YEAR \$ <u>245</u>
MATERIAL _____ <u>758</u>		FORECAST YEARS
PURCHASED SERVICES _____	SEP \$ _____	YEAR 1 _____ <u>616</u>
IS HARDWARE _____	OCT _____	YEAR 2 _____
IS SOFTWARE _____	NOV _____	YEAR 3 _____
OTHER _____	DEC _____	TOTAL \$ <u>861</u>
PROJECT COST \$ _____ <u>758</u>	JAN _____	
ADMIN & GENERAL 13.61 % OF PROJECT _____ <u>103</u>	FEB _____	
SUB TOTAL \$ _____	MAR _____	
AFUDC _____ % OF SUBTOTAL _____	APR _____	
TOTAL CAPITAL COST \$ _____ <u>861</u>	MAY _____	
	JUN _____	
	JUL _____ <u>245</u>	
	AUG _____	
	TOTAL \$ <u>245</u>	
ESTIMATED BY: <u>Derek Graham - Fleet Operations</u>		SUBMITTED BY DEPARTMENT
DATE: <u>3/20/2015</u>		MANAGER/DIRECTOR

CAPITAL PROJECT
BUDGET JUSTIFICATION

Department: Fleet Operations

Fiscal Year: 2016

Project Title: Vehicle Additions

Estimated Cost: \$861,000

Type of Project:	Addition	<u> X </u>
	Replacement	<u> </u>
Basis of Justification:	Safety	<u> </u>
	Reliability	<u> X </u>
	Improved Efficiency	<u> </u>
	Enforced Relocation	<u> </u>
	Business Improvement	<u> X </u>

Justification - Attach the following information for each project.

1. **Detailed explanation of project.**
To provide additional capacity to support the replacement of cast iron main.
2. **Identify consequences of not doing this project.**
2. **Economic analysis using simple payback method.**
4. **If economic analysis cannot justify the project, provide justification for why the project is required, i.e. code or regulatory requirement (state specific code/regulation), safety (provide specific historical data to explain the current condition) etc.**
5. **Identify options/alternatives for this project.**

