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September 27, 2024

VIA ELECTRONIC FILING

Brinda Westbrook-Sedgwick
Commission Secretary
Public Service Commission
of the District of Columbia
1325 "G" Street, N.W., 8th Floor
Washington, D.C. 20005

Re: Formal Case No. 1179 [Washington Gas's Revised Application -PUBLIC]

Dear Ms. Westbrook-Sedgwick:

Pursuant to Public Service Commission of the District of Columbia ("Commission") Order No. 22241 issued in Formal Case Nos. 1179 on July 26, 2024,[1] Washington Gas Light Company ("Washington Gas" or "Company") hereby submits its Revised Application for Approval of The District Strategic Accelerated Facility Enhancement ("District SAFE") Plan, seeking authorization to undertake targeted replacement of certain vintage materials on its system in the District and to recover the costs associated with doing so through the previously approved surcharge mechanism for the Company's accelerated pipe replacement program.

Please direct questions regarding the enclosed to the undersigned.

Sincerely,

John C. Dodge
Associate General Counsel and
Director, Regulatory Matters

cc: Per Certificate of Service

[1] Formal Case No. 1179, *In the Matter of the Investigation into the Washington Gas Light Company's Strategically Targeted Pipe Replacement Plan*, Order No. 22241 (July 26, 2024).

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

FORMAL CASE NO. 1179

IN THE MATTER OF THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S
STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN

VOLUME 1 OF 1

PUBLIC

APPLICATION AND DIRECT TESTIMONY
WG (A) THROUGH WG (F)

(WITNESSES ROGERS, QUARTERMAN, JACAS, STUBER, OLIPHANT
AND LAWSON)

SUPPORTING EXHIBITS
WG (A)-1 THROUGH WG (A)-3, WG (B)-1 THROUGH WG (B)-2,
WG (C)-1, AND WG (F)-1 THROUGH WG (F)-2

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DATED: SEPTEMBER 27, 2024

APPLICATION

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

In the Matter of the Investigation into	**)**	
Washington Gas Light Company's	**)**	**Formal Case No. 1179**
Strategically Targeted Pipe Replacement Plan	**)**	

WASHINGTON GAS LIGHT COMPANY'S REVISED APPLICATION FOR APPROVAL OF THE DISTRICT STRATEGIC ACCELERATED FACILITY ENHANCEMENT PLAN

I. INTRODUCTION

Pursuant to Public Service Commission of the District of Columbia ("Commission") Order No. 22241 issued in Formal Case Nos. 1179 on July 26, 2024,[1] Washington Gas Light Company ("Washington Gas" or "Company") hereby submits its Revised Application for Approval of The District Strategic Accelerated Facility Enhancement ("District SAFE") Plan, seeking authorization to undertake targeted replacement of certain vintage materials on its system in the District and to recover the costs associated with doing so through the previously approved surcharge mechanism for the Company's accelerated pipe replacement program.

Washington Gas is focused on fulfilling its statutory obligations to provide safe and adequate gas service to the District of Columbia ("the District").[2] These obligations, coupled with Washington Gas's desire to ensure the safety of its customer base in the District, form the basis for the Company's efforts to accelerate the replacement of the higher risk pipe in its system. Through the use of risk identification "Best Practices" in the industry,[3] District SAFE ensures the "safety and reliability of the gas distribution system in the District."[4] In support of District SAFE,

[1] Formal Case No. 1179, *In the Matter of the Investigation into the Washington Gas Light Company's Strategically Targeted Pipe Replacement Plan*, Order No. 22241 (July 26, 2024).
[2] D.C. Code § 34-1101(a).
[3] PHMSA: Pipeline Risk Modeling Overview of Methods and Tolls for Improved Implementation.
[4] Formal Case Nos. 1154, 1175, 1179, Order No. 22003, 5 (June 12, 2024).

Washington Gas will be employing its risk identification model—the JANA Lighthouse model—to ensure that its pipeline replacement program improves on the lessons learned through its decade of experience implementing PROJECT*pipes* ("PIPES"), as well as lessons learned and best practices across the industry over the time since the Pipeline and Hazardous Materials Safety Administration ("PHMSA") Call to Action.

Just as the previous two PIPES programs were found to be crucial in addressing imminent safety risks in the District, so too should the Commission find that Washington Gas's proposed District SAFE is not only warranted, but necessary. Given the vintage and aged infrastructure in the District—which contains the highest percentage of cast iron distribution main in the country[5]—an accelerated replacement program with accelerated cost recovery is even more warranted now than it was in the two previous applications, both of which were approved by the Commission. Given the reality of the District's gas infrastructure, the Commission has a legal obligation to ensure that Washington Gas can quickly, robustly, and safely replace its aging and highest-risk gas infrastructure.[6] As part of this Application, the Company has not modified its long-standing, Commission-approved cost recovery mechanism, nor has it accelerated the pace at which capital will be deployed compared to PIPES 2, consistent with the Commission's Order No. 22003. Thus, the Company is not asking for anything new in the form of cost recovery. However, District SAFE is consistent with the Commission's express recognition that an even faster, accelerated replacement pace is needed and "of paramount importance."[7] As such, the Commission should not now, after two previously approved accelerated cost recovery plans for replacing the high-risk,

[5] Direct Testimony of Cynthia L. Quarterman ("Quarterman Testimony"), at 24.
[6] *See* D.C. Code § 1-204.93.
[7] Formal Case No. 1115, *Application of Washington Gas Light Company for Approval of a Revised Accelerated Pipe Replacement Program,* Order 17602, ¶ 133 (Aug. 21, 2014) (Commission requesting a shorter 25-year analysis for pipeline replacement); Order 17789, ¶ 63 (Jan. 29, 2015).

aged infrastructure, and with many miles still left to go in the District, suddenly change the manner through which the Company achieves this critical safety objective. Doing so will only hamper the program's potential for success.

Further, District SAFE helps further the District's climate goals through its use of updated risk modeling. Using a risk prioritization model that ensures the most leak-prone, riskiest, and, thus, the pipelines most likely to emit greenhouse gas emissions are prioritized for replacement reduces the Company's overall greenhouse gas emissions profile.[8] By approving the Plan, the Commission ensures that it will satisfy its duty to consider environmental impacts in the District, while also remaining consistent with its obligation to ensure the delivery of safe and reliable natural gas service.[9] As such, the Commission should approve Washington Gas's District SAFE Plan and authorize the Company to recover the costs associated with the Plan through the approved surcharge mechanism for the Company's accelerated pipe replacement program.

II. DISTRICT SAFE PRIORITIZES GAS SYSTEM AND CUSTOMER SAFETY WHILE FOCUSING ON REPLACING THE MOST LEAK-PRONE PIPE

A. Washington Gas and the Commission Must Prioritize the Safety of the District's Gas System

Following a string of natural gas infrastructure disasters, replacement of aging natural gas infrastructure became a national priority. Beginning in 2011, the U.S. Department of Transportation led a nationwide "Call to Action" to replace, repair, and rehabilitate the highest-risk pipelines across the country.[10] Most of these accidents involved cast iron infrastructure.[11] A

[8] *See* Order No. 22003, at ¶ 48; Direct Testimony of Ken Oliphant ("Oliphant Testimony"), at 10-11.
[9] Order No. 22003, at ¶ 47 ("the Commission cannot allow the system to deteriorate unabated, even as the District undergoes its energy transition thus, a strategically focused pipe replacement program needs to be considered to avoid cascading leaks in the future by replacing aging, leak-prone high-risk mains and services, thereby enhancing the safety, reliability, and GHG emissions for the District residents until the plans for full electrification are solidified.").
[10] Quarterman Testimony, at 7.
[11] *Id*.

subsequent assessment of the country's natural gas infrastructure showed that "many natural gas distribution pipelines were relying on assets that were well beyond their initially forecasted lifespan," resulting in increasing focus on replacing the country's aging natural gas infrastructure.[12] The Call to Action targeted a variety of vintage materials in addition to cast iron, such as wrought iron, bare steel, copper, and certain first generation plastic pipes. Even though the Call to Action was originally issued in 2011, it is an ongoing national concern, as exemplified by the Bipartisan Infrastructure Law of 2021, which "authorized a new Natural Gas Distribution Infrastructure Safety and Modernization Grant Program to repair, rehabilitate or replace municipal or community-owned distribution pipeline systems to reduce safety incidents and avoid economic loss."[13]

Of particular concern is the fact that the District of Columbia continues to have a disproportionately high percentage of cast or wrought iron mains since 2011, significantly greater than the national average.[14] A continuing examination of natural gas infrastructure has shown that cast iron pipeline infrastructure is much riskier and more dangerous than other types of infrastructure, regardless of the associated emissions profile.[15] Even though cast iron accounts for only one percent of all distribution mains nationally, those cast iron mains are responsible for nine percent of all main-related incidents.[16] Such incidents are also ***twice as likely*** to cause fatalities and injuries and are responsible for a disproportionate number of fatalities and injuries on gas distribution mains.[17] Cast iron-related incidents have not ceased; rather, recently they have continued to occur as a result of disturbances such as heavy rainfall, earth movement, water

[12] Quarterman Testimony, at 11.
[13] *Id.* at 20-21; H.R. 3684, Infrastructure Investment and Jobs Act.
[14] *See* PHMSA Cast Iron Inventory.
[15] Quarterman Testimony, at 11.
[16] *Id.*
[17] *Id.*

erosion, and leaks at joints.[18] These incidents speak to the relative fragility of cast iron pipes, and the necessity of their expedited and careful removal.

However, District SAFE is not solely a cast iron replacement program. Rather, consistent with Paragraph 68 of Order No. 17431, all pipelines targeted in the Plan are replacements necessary to reduce risk and enhance safety by replacing aging, corroded, and leaking cast iron mains, bare and unprotected steel mains and services, and copper services in the distribution system.[19] Unprotected bare steel mains and services in Washington Gas's profile have the highest number of leaks per mile (9.6 leaks/mile for main and 10.6 leaks/100 service segments).[20] The JANA model considers leaks, and numerous other factors contributing to risk of an event and severity of an event, in order to ensure that the Company's prioritization most efficiently, cost-effectively, and safely "[targets] the highest risk segments of the aging, leak-prone mains, and services in the district."[21] Approval of the Plan and the associated cost recovery mechanism will enable continued accelerated replacement of higher-risk assets, significantly enhancing the District's safety, which the Commission is required to ensure.

The Commission itself has acknowledged the problems with the District's gas infrastructure. The Commission previously found that Washington Gas's "daily operations, including pipeline replacements, have important public safety implications,"[22] and has gone so far as to explicitly conclude that "there is an ***imminent threat to public safety*** that requires WGL to continue to replace leak-prone, aging infrastructure." Formal Case No. 1154, Order No. 20671, 115 (Dec. 11, 2020) (emphasis added). Further, the Commission also found that "[Washington

[18] Quarterman Testimony, at 12-13; *see* PHMSA Cast Iron Inventory.
[19] Formal Case Nos. 1093 and 1115, Order No. 17431, at 68.
[20] Quarterman Testimony, at 16.
[21] Order No. 22003, at ¶ 49.
[22] Formal Case No. 1154, Order No. 20671, 18 (Dec. 11, 2020) (quoting Formal Case No. 1093, Order No. 17132, ¶ 250 (May 15, 2013)).

Gas's] distribution infrastructure in the District is one of the oldest and most leak-prone gas distribution systems in the region. To ignore the age and leaks of the Company's distribution system in the District would ignore legitimate safety and reliability concerns on said distribution system."[23] Washington Gas agrees. As the Company's witnesses in District SAFE testify, the risks associated with vintage facilities cannot truly be addressed through anything other than full replacement of aged and vulnerable facilities; spot repairs will only further weaken vintage materials or engender avoidable leaks. As such, the District SAFE Plan prioritizes addressing these safety issues through expeditious retirement that seeks to proactively remove facilities ***before*** any further leak events occur that could threaten safety and increase emissions. In other words, the proposed Plan supports the Commission in meeting its existing obligations to ensure the delivery of safe and reliable gas in the District.

Consistent with Order No. 22003, the District SAFE Plan "[t]argets the highest risk segments of the aging, leak-prone mains, and services in the district."[24] Through the new JANA Lighthouse model, the Plan's risk prioritization uses an empirical assessment particular to Washington Gas's asset profile and incorporates risk assessments based on material type and age.[25] This allows Washington Gas to appropriately target its aged facilities, and "narrowly focus on aging, highest-risk pipe that are highly susceptible to leaks," thus lowering the "GHG emissions from leaks[] and [minimizing] subsequent failures [of the pipe] in the near future."[26]

Indeed, the methods employed by the Plan to prioritize risk not only meet all statutory obligations,[27] they are recognized as "Best Practice" in the industry.[28] The JANA Lighthouse

[23] Order No. 20671, at ¶ 34.
[24] Order No. 22003, at ¶ 49.
[25] Oliphant Testimony, at 13.
[26] Order No. 22003, at ¶ 49.
[27] *See* D.C. Code § 1-204.93.
[28] Oliphant Testimony, at 8 (citing to PHMSA: Pipeline Risk Modeling Overview of Methods and Tolls for Improved Implementation).

model is an extremely precise, widely used model, with excellent accuracy, maintaining "90% confidence limits and a leak prediction accuracy of 94%."[29] This accuracy persists when contextualized to Washington Gas's system. Specifically, for the top 15% of assets in the District system predicted to be the most leak prone by JANA, actual observed leaks were roughly ***600%*** higher than the leak rate in the remaining 85% of assets; for the top 5% of assets the actual observed leaks were ***1200%*** higher than the remaining 95% of assets.[30] The District SAFE Plan's data-driven and risk-prioritized approach ensures a pipeline infrastructure replacement program that is state of the art while moving towards the twin goals of the District: improved safety and emissions reductions.

Washington Gas seeks not only to satisfy the District's and Commission's goals with its District SAFE Plan. In addition, the Company's proactive focus on pipeline safety also aligns with the Commission's past orders and the priorities of the federal government and PHMSA. As the Commission acknowledges, "PHMSA continues to encourage the Commission to consider initiatives to remove and/or replace unprotected steel, cast iron, and other high-risk pipes within the District to enhance pipeline safety."[31] In fact, a 2024 letter from PHMSA to the Commission states, "PHMSA encourages initiatives to remove and/or replace unprotected steel, cast iron, and other high-risk pipes within those gas distributions operators under the DCPSC authority . . . . The continued initiative to remove these types of pipes will enhance pipeline safety and ***should be monitored and accelerated as much as possible*** by the DCPSC ***until all high-risk pipe has been removed***."[32] Centering safety is also consistent with PHMSA's March 2011 Call to Action urging

[29] Oliphant Testimony, at 17.
[30] *Id.*
[31] Order No. 22003, 15–16.
[32] Letter from Pipeline Hazardous Materials Safety Administration to Public Service Commission of the District of Columbia, 2 (May 13, 2024) (emphasis added).

the acceleration of efforts to replace aging gas system infrastructure. Alongside the Call to Action, PHMSA officials—those charged with ensuring the safe and reliable operation of the country's natural gas infrastructure—encouraged legislators and state regulators to adopt and approve special rate mechanisms to allow for accelerated infrastructure replacement of gas system materials that are prone to leakage and are high-risk, like cast iron.[33] By approving District SAFE, the Commission will continue to fulfill PHMSA's Call to Action.

Finally, the Commission acknowledged that it has a role to play in supporting Washington Gas in meeting this obligation in its most recent Order requiring the submission of this application, stating clearly that the Commission itself "must ensure the continued safety and reliability of the gas distribution system in the District."[34] This obligation to ensure safety is so fundamental to its oversight of Washington Gas that Congress, in the District Charter established under the D.C. Home Rule Act, explicitly established that "[the Commission's] function shall be to ***insure*** that ***every public utility doing business*** within the District of Columbia ***is required to furnish service and facilities reasonably safe and adequate and in all respects just and reasonable***."[35] This Commission has consistently recognized its duty by law and its obligation to citizens of the District to make regulatory decisions that further the safety of residents. Approving the District SAFE Plan is plainly in furtherance of those obligations.

B. Accelerated Cost Recovery is Necessary for Washington Gas to Implement the District SAFE Plan and Prioritize Replacement of the Highest-Risk Infrastructure

Washington Gas's proposed cost recovery mechanism is necessary to meet its safety obligations. Given the reality of the District's gas infrastructure as described above, the Commission should support Washington Gas's proactive efforts to quickly, robustly, and safely

[33] Quarterman Testimony, at 6-7.
[34] Order No. 22003, at 5.
[35] D.C. Code § 1-204.93 (emphasis added).

replace its aging and risky natural gas infrastructure. By approving the District SAFE Plan, the Commission not only satisfies its legal obligations,[36] but it also positions the Commission alongside other progressive utility commissions approving accelerated cost recovery mechanisms for high-risk infrastructure replacement programs.[37]

Accelerated cost recovery is necessary for the expedited repair of aging and high-risk infrastructure. Since PHMSA issued its Call to Action to accelerate the replacement of the highest-risk pipeline infrastructure, 24 states and one territory have completely eliminated cast and wrought iron gas distribution pipelines.[38] In the remaining states where cast and wrought iron are present, all of those states are engaged in programs that support accelerated replacement activities and have accelerated cost recovery mechanisms or alternative ratemaking that incorporates future infrastructure investments into base rates in order to support the continuous progress toward eliminating all of the high risk materials.[39] This is not surprising; PHMSA recognized that in order

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[36] *See* D.C. Code § 1-204.93.

[37] NARUC, *Natural Gas Distribution Infrastructure Replacement and Modernization: A Review of State Programs*, 25–27 (Jan. 2020), available at https://edocket.dcpsc.org/apis/api/Filing/download?attachId=184409&guidFileName=f2d06e78-65d6-406e-aafc-93b00e8b3379.pdf.

[38] According to the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), twenty-four states and one territory have completely eliminated cast or wrought iron natural gas distribution lines within their borders, Alaska, Arizona, Arkansas, Colorado, Hawaii, Iowa, Idaho, Kansas, Mississippi, Minnesota, Montana, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Puerto Rico, South Carolina, South Dakota, Utah, Vermont, Washington, Wisconsin, and Wyoming. https://www.phmsa.dot.gov/data-and-statistics/pipeline-replacement/pipeline-replacement-background.

[39] Forty-one states and the District of Columbia had established some sort of state infrastructure replacement funding mechanism as of 2019 and were in a good place to retire aging pipelines. *See* American Gas Association, "State Infrastructure Replacement Activity" Report, Oct. 21, 2019, https://www.AGA.org/WP-content/uploads/2022/11/agastatereplacementactivity.docx; *see also* National Association of Regulatory Utility Commissioners, "Natural Gas Distribution Infrastructure Replacement and Modernization; A Review of State Programs" report, January 2020, https://pubs.naruc.org/pub/45E90C1E-155D-0A36-31FE-A68E6BF430EE?_gl=1*15x86qv*_ga*NzcwODg5NzI2LjE2ODQ0Mjg0NDI.*_ga_QLH1N3Q1NF*MTY5MjgxNTExOS4yNTguMS4xNjkyODE1Mzg2LjAuMC4w; *see also* examples of local distribution companies' programs to expedite removal of cast iron and unprotected steel pipelines, Department of Energy, Office of Energy Policy and Systems Analysis, "Natural Gas Infrastructure Modernization Programs at Local Distribution Companies: Key Issues and Considerations" January 2017 at 31-2, Table 2, https://www.energy.gov/sites/prod/files/2017/01/f34/natural%20gas%20infrastructure%20modernization%20programs%20at%20local%20distribution%20companies—key%20issues%20and%20considerations.pdf

for its Call to Action to succeed, it was crucial "to ensure that pipeline operators had the ***funding necessary*** to replace high-risk pipelines ***as soon as possible***."[40] This Commission recognized this, as well, and approved an accelerated cost recovery mechanism for the Company's PIPES 1 and PIPES 2 programs.[41] Prior to its accelerated replacement program, the Company's pace would take more than 100 years for removal of vintage materials. It is thus necessary that an accelerated rate recovery mechanism is approved, because the only other alternative for cost recovery currently available in the District would force Washington Gas to rely on traditional ratemaking authority with a years-long delay for cost recovery after the deployment of capital, resulting in an unreasonably long and unsafe delay in replacing vintage pipe. Washington Gas is simply seeking consistency from the Commission to ensure continued improvement in its accelerated pipeline replacement work.

The Company seeks to continue the already established precedent of accelerated recovery of costs associated with the infrastructure replacement program in its District SAFE Plan. Specifically, the Company seeks to use the same accelerated pipe replacement surcharge mechanism previously approved by the Commission in Formal Case Nos. 1115 and 1154.[42] This request is consistent with the Commission's order for Washington Gas to "balance the need to replace leak-prone, highest-risk pipe segments to prevent dangerous...leaks while minimizing stranded assets."[43]

Given the time delay associated with traditional rate recovery, the only appropriate mechanism to ensure Washington Gas has the capital to conduct accelerated replacement activity,

[40] Quarterman Testimony, at 9.
[41] Order No. 17789; Order No. 20671.
[42] However, in accordance with Commitment 72 in Appendix A of Order No. 19396 issued by the Commission in Formal Case No. 1142, "excess costs" as defined in the commitment shall not be recovered through the surcharge mechanism, but rather will be subject to a prudence review in the Company's next base rate case.
[43] Order No. 22003, at ¶ 48.

thereby furthering District residents' safety, is through the use of an accelerated cost recovery mechanism. Indeed, even the Department of Energy has found that "[Local Distribution Companies] are unlikely or unable to undertake replacement programs without some ***prior guarantee of timely cost recovery***."[44] Absent the approval of an accelerated cost recovery mechanism, Washington Gas cannot feasibly implement the District SAFE Plan, which is necessary to address the safety risks and emissions of its infrastructure. The Commission's support for full and timely cost recovery is critical to the Company's ability to grow its union labor workforce, support long-term planning strategies that can achieve cost efficiencies, and to get funding from the financial market at a reasonable cost.

Given the aforementioned reality of Washington Gas's cast iron infrastructure, accelerated cost recovery is necessary to ensure that the work is conducted as safely, efficiently, robustly, and quickly as possible. Replacing the Company's infrastructure without timely recovery is prohibitively costly because the aged and high-risk pipelines are difficult to handle, replace, and identify when damaged. For instance, graphited cast iron pipelines leave "a brittle sponge-like structure of graphite flakes" which means that they "may not appear to be damaged" and can hold gas under pressure, but even a minor impact can fracture them and cause a natural gas incident.[45] For some of these facilities, the mere action of responding to a leak report to check on the status of the pipeline by ***opening the street will cause damage*** that will lead to a leak. In other words, the pipelines must be handled with 'kid gloves,' which increases the costs associated with their

[44] U.S. Department of Energy, *Natural Gas Infrastructure Modernization Programs at Local Distribution Companies: Key Issues and Considerations*, 6 (Jan. 2017) (emphasis added).
[45] Quarterman Testimony, at 12; PHMSA Guidance Manual for Operators of Small Natural Gas Systems, III-5 (Jan. 2017), https://www.PHMSA.dot.gov/sites/phmsa.dot.gov/files/doc/small_natural_gas_operator_guide_%28january_2017%29.pdf.; PHMSA Part 192 Corrosion Enforcement Guidance at 150, https://www.PHMSA.dot.gov/sites/PHMSA.dot.gov/files/docs/corrosion_enforcement_guidance'part192_12_7_2015.pdf.

replacement.[46] Without accelerated cost recovery, Washington Gas will be unable to aggressively approach replacing its infrastructure to further bolster safety within the District.[47]

While NARUC has recognized the District, along with 41 states, as an innovator in cost recovery mechanisms for its accelerated infrastructure replacement recovery plans, the Commission will not maintain being on the cutting edge of utility rate design if it now disapproves the same mechanism.[48] In fact, the District is falling behind some of its progressive counterparts that have incorporated both accelerated cost recovery and innovative approaches to base rate design to improve public safety, reduce emissions, and reduce the regulatory burden on all parties to the process.[49] The Commission needs to ensure it continues as a leader in the industry supporting critical safety work that also achieves accelerated emissions reductions. As such, in tandem with bringing the District's gas infrastructure into the modern age, the Commission must also modernize its cost recovery procedures for infrastructure programs.

C. The District SAFE Plan Targets the Most "Leak-Prone" Pipes as Ordered

The District has adopted ambitious net-zero climate goals which, necessarily, entail the rapid decarbonization of the gas industry.[50] Consistent with this, the Commission ordered Washington Gas to ensure that the District SAFE Plan aligns with the District's climate goals and "[t]argets the highest risk segments of the aging, leak-prone mains[] and services" which will, necessarily, decrease the associated GHG emissions.[51] Because the fuel delivery networks

[46] *See* Quarterman Testimony, at 12-15.
[47] NARUC, *Natural Gas Distribution Infrastructure Replacement and Modernization: A Review of State Programs*, at 8 ("uncertainty with regard to cost recovery may cause an LDC to be very conservative in its infrastructure replacement efforts.").
[48] *Id.*
[49] *Id.* at 25-27; *see also* CA SB 1371; *see also* Ill. Admin. Code tit. 83, § 556.40.
[50] GTI Energy*, Natural Gas Infrastructure in the United States: Evolving Towards a Net-Zero Emissions Future*, 22 (Dec. 2023) ("Decarbonization of the natural gas industry will need to address emissions associated with the delivery of natural gas, as well as reduce the production-related emissions of natural gas.").
[51] Order No. 22003, at ¶ 49.

associated with gas utilities are so extensive in scale, addressing leaks from these pipelines "are pivotal" to the District's net-zero climate goals.[52] Pipes that are prone to leakage are significantly more prone to emitting fugitive methane emissions, which means that by addressing these leakage-prone pipes, Washington Gas is continuing to reduce the fugitive emissions from its system. The District SAFE Plan as proposed targets the highest-risk and most leak-prone pipes by enabling selection of projects that reduce both the most overall risk and future potential methane emissions,[53] as ordered by the Commission,[54] and further reduces the Company's emissions profile. As shown in the Plan, further accelerated replacement through District SAFE would reduce the Company's annual direct Scope 1 fugitive emissions from distribution mains and services from the current approximately 66,300 to approximately 5,300 metric tons of carbon dioxide equivalent, representing an approximately 92% reduction in fugitive emissions attributed to distribution mains and services.[55]

The Commission should support Washington Gas's plan for an accelerated prioritization of replacing the riskiest and most leak-prone pipes in its asset portfolio, because aged and leakage-prone pipes result in fugitive emissions, which is "one of the most significant sources of emissions for the natural gas industry."[56] As such, the Plan "aligns [its] GHG reductions with the targets adopted in the Climate Commitment Act of 2022" as ordered by the Commission.[57] The Plan also adheres to the Commission's Order to Washington Gas to "balance the need to replace leak-prone, highest risk pipe segments to prevent dangerous cascading and hidden super emitter leaks."[58]

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[52] *Id.*
[53] Oliphant Testimony, at 17.
[54] Order No. 22003, ¶ 48.
[55] District SAFE Plan, at 38.
[56] GTI Energy*, Natural Gas Infrastructure in the United States: Evolving Towards a Net-Zero Emissions Future*, at 20.
[57] Order No. 22003, at ¶ 18; *see also* Order No. 21938.
[58] Order No 22003, at ¶ 48.

Approval of the Plan will allow the Commission to meet its twin aims of safety improvements and emission reductions. JANA Corporation Executive Vice President and Chief Innovation Officer Ken Oliphant explains in his testimony, "As leaks are directly tied to methane emissions, and assets that are the most leak-prone are identified by the models as having greater risk, JANA's prioritization process is aligned with the District's climate goals in that it enables identification and removal of the most emission-prone (i.e., leak prone) asset sub-populations in a targeted way (through providing asset specific forecasts and identifying those specific assets within the ARP eligible asset population with the highest potential for future leaks)."[59] And for the specific ARP eligible projects selected by WGL based on the JANA model outputs, "the models forecast that over 96% of the potential for future leaks is removed annually on replacement of these specific leak prone assets along with greater than 90% of potential risk removed annually.[60]" Reducing emissions while reducing risk is a win-win for the District and its residents.

III. CONCLUSION

For the reasons stated herein, Washington Gas Light asks that the Commission approve its Application and grant the Company accelerated cost recovery for the necessary safety work that will be accomplished over the three-year period covered in the District SAFE Plan.

Respectfully submitted,

Karen Hardwick
Senior Vice President and General Counsel

John Dodge
Assistant General Counsel and Director,
Regulatory Matters

[59] Oliphant Testimony, at 16.
[60] *Id.* at 11.

Cathy Thurston-Seignious
Supervisor, Administrative and
Associate General Counsel

WASHINGTON GAS LIGHT COMPANY
1000 Maine Avenue, SW, Suite 700
Washington, DC 20024

September 27, 2024

WITNESS ROGERS
EXHIBIT WG (A)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF	)	
THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	)	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

DIRECT TESTIMONY OF JESSICA R. ROGERS
Exhibit WG (A)
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Exhibits

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF JESSICA R. ROGERS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Jessica R. Rogers, and I am the Vice President, Regulatory and Climate Strategy for Washington Gas Light Company ("Washington Gas" or "Company"). My business address is 1000 Maine Avenue, S.W., Washington, District 20024.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I have more than 15 years of experience in and around the energy industry, largely with public utilities. I joined Washington Gas in June 2024, where I oversee the regulatory responsibilities of Washington Gas in all of its state jurisdictions (District, MD and VA), as well as SEMCO in Michigan. I am also responsible for monitoring the interests of Washington Gas and SEMCO in front of the Federal Energy Regulatory Commission ("FERC"). Prior to my current role, I was with UGI Utilities, Inc. for three years, concluding in the role of Senior Director – Rates and Regulatory Strategy. At UGI, I oversaw the rate and regulatory needs of both the gas and electric operations, before state regulators in Pennsylvania and Maryland, as well as FERC. Prior to UGI, I served as outside counsel for more than a decade. In that capacity, I provided legal advice and litigation support to natural gas, electric, water and wastewater

utilities in front of the Pennsylvania Public Utility Commission. I also appeared before FERC and the Surface Transportation Board. I received my Bachelor of Arts from the University of California, Los Angeles, and my Juris Doctorate from the University of Virginia School of Law.

II. PURPOSE OF TESTIMONY

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of Washington Gas Light Company ("Washington Gas" or the "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I am the primary sponsor of the Company's proposed Strategic Accelerated Facilities Enhancement ("District SAFE") Plan. As such, the District SAFE Plan is included with my testimony as Exhibit WG (A)-1. The purpose of my testimony is to, first, present the Company's list of witnesses, and the issues addressed by each witness. Second, I provide the procedural and operational background leading to the District SAFE Plan. Third, I will address certain substantive portions of the District SAFE Plan that I sponsor. Finally, I will address certain portions of the Commission's Order No. 22003 issued on June 12, 2024.

Q. WHAT PORTIONS OF DISTRICT SAFE ARE YOU SPONSORING?

A. In addition to sponsoring the District SAFE Plan as an exhibit to my testimony, I am sponsoring Sections I, VII, and VIII of the plan. I describe this in greater detail in Section VI of my testimony, below.

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes, I sponsor Exhibits WG (A)-1 through 3.

III. ORGANIZATION OF TESTIMONY

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. In Section IV, I will provide an overview of the witnesses to this proceeding and a brief list of issues that each witness will address, as well as identifying any portions of the District SAFE Plan that they directly sponsor. In Section V, I provide the procedural and operational background leading to the proposed District SAFE Plan and identify key elements of the plan. In Section VI, I discuss in greater detail certain portions of the District SAFE Plan, for which I am the sponsor. And, finally, in Section VII of my testimony, I address certain elements of the Commission's Order No. 22003.

IV. OVERVIEW OF WITNESSES

Q. PLEASE IDENTIFY THE OTHER WITNESSES PROVIDING DIRECT TESTIMONY ON BEHALF OF WASHINGTON GAS IN THIS PROCEEDING, AND THE SUBJECT MATTER OF THEIR TESTIMONY.

A. In addition to my testimony, the following witnesses are providing testimony in support of the Company's request:

- **CYNTHIA L. QUARTERMAN** (Exhibit WG (B)). Ms. Quarterman is an independent consultant testifying on behalf of Washington Gas based on her extensive experience addressing pipeline safety issues. Ms. Quarterman's testimony will address the history of the Pipeline and Hazardous Materials Safety Administration ("PHMSA") Call to Action, which served as the catalyst for Washington Gas and many other utilities to adopt accelerated replacement programs, and its continued relevance today. She also provides recommendations regarding the ongoing need to expeditiously address vintage materials on the Washington Gas system.

- **WAYNE JACAS** (Exhibit WG (C)) Mr. Jacas is the Director Construction Program & Strategy Management at Washington Gas. Mr. Jacas provides an overview of the replacements accomplished in PROJECT*pipes* 2 and

supports the accelerated replacements that will be accomplished over the three years of District SAFE. Mr. Jacas also supports the identified funding needed to accomplish the targeted replacement activities identified in the Plan. In addition, Mr. Jacas sponsors Sections IV, V (b through e) and VI of the District SAFE Plan.

- **AARON STUBER** (Exhibit WG (D)) Mr. Stuber is the Senior Director of Asset Management at Washington Gas. Mr. Stuber's testimony explains why the Company moved to the JANA risk model, and the improvements to the replacement program that will be achieved as a result. In addition, Mr. Stuber sponsors Sections II and III of the District SAFE Plan.

- **KEN E. OLIPHANT** (Exhibit WG (E)) Mr. Oliphant is the Executive Vice President and Chief Innovation Officer for JANA Corporation, and is responsible for oversight of JANA's risk modeling technology. Mr. Oliphant's testimony discusses the JANA risk model being deployed by Washington Gas. In his testimony, Mr. Oliphant will explain how the prioritization process and removal of identified facilities reduces risk by targeting leak prone assets, thereby making the system safer and more reliable. Mr. Oliphant will also address how the use of JANA addresses the District's climate goals.

- **R. ANDREW LAWSON** (Exhibit WG (F)) Mr. Lawson is the Manager of Regulatory Affairs at Washington Gas. Mr. Lawson's testimony supports the Company's request for the continuation of the Accelerated Pipe Replacement Program ("APRP") Adjustment and provides an explanation of the elements of the mechanism. Mr. Lawson also discusses why the APRP is necessary for successful implementation of District SAFE.

V. OVERVIEW OF DISTRICT SAFE PLAN

Q. PLEASE DESCRIBE THE PROCEDURAL BACKGROUND LEADING TO THE PROPOSED DISTRICT SAFE PLAN.

A. In response to the PHMSA Call to Action, which is described in greater detail in Ms. Quarterman's testimony, Washington Gas proposed an accelerated pipeline replacement program for facilities located in the District beginning in 2014. The Company's original proposal sought to accelerate removal of targeted vintage materials within 40 years. It was approved by the Commission on March 31, 2014 in Formal Case No. 1093. Over the following years, the Company

obtained further approvals and extensions of its replacement program, as described in greater detail in Mr. Jacas's testimony. Relevant to our purposes here, on December 22, 2022, the Company filed its PIPES 3 Plan, seeking approval of a five-year program reflecting a total of $641 million of investment (i.e., an average investment of $128 million per year). On June 12, 2024, the Commission issued Order No. 22003, wherein it rejected the Company's filing and established a new docket, new expedited timeline for consideration of a revised plan, and additional parameters to be addressed in the revised plan. On July 26, 2024 the Commission issued Order No. 22241 which established September 27, 2024 as the new due date for the Company's revised plan.

Q. HAS THE COMPANY ADDRESSED ALL OF THE ADDITIONAL PARAMETERS IDENTIFED BY THE COMMISSION?

A. Yes, as shown in Appendix A to the Application, the Company has addressed the additional parameters included in Order No. 22003.

Q. AT A HIGH LEVEL, WHAT IS THE COMPANY PROPOSING IN DISTRICT SAFE?

A. In District SAFE, Washington Gas will target the replacement of its highest-risk infrastructure comprised of vintage materials subject to PHMSA's Call to Action, and will increase its total expenditures from approximately $150 million under the current three-year PIPES 2 Plan (not including the extension period) to approximately $215 million over the next three years. The work done pursuant to District SAFE would be eligible for cost recovery under the APRP Adjustment. The Plan is described in greater detail in the testimony of Mr. Jacas.

Q. WHY IS AN ACCELERATED PIPELINE PROGRAM NECESSARY IN THE DISTRICT?

A. There are both operational and financial reasons that an accelerated pipeline program is necessary in the District. Operationally, as described in the Plan and in the testimony of other witnesses, the Company's system is comprised of a large amount of vintage materials. As described by Ms. Quarterman, the District can and should do more to increase the pace at which higher risk vintage facilities are retired. Financially, the significant regulatory lag at play in the District – caused both by the District's reliance on an historic test year and its long and unpredictable procedural process – ensures that even annual base rate proceedings would still leave the Company in an underearning position at the needed investment pace for replacement for these facilities. For these reasons, the accelerated replacement program identified by PHMSA in its Call to Action continues to be a critical tool.

Q. DOES THE YEAR THREE INVESTMENT REFLECT THE NEEDED INVESTMENT PACE IN THE DISTRICT?

A. It does not. The Company will need to continue further accelerating its investment in system replacement activities to manage the risk to safety and reliability in its District operations.

Q. HOW DOES DISTRICT SAFE BENEFIT CUSTOMERS?

A. District SAFE benefits customers by targeting at-risk facilities for expedited replacement, allowing the Company to remove as much risk from its system as quickly as possible within the budget approved by the Commission. This will ensure the Company's ability to provide safe and reliable service in the District into the future, and actively address the federal safety commitments established by PHMSA. In addition, targeted removal of vintage facilities reduces GHG emissions immediately and on a going-forward basis over the life of the new

facilities, and will position the Company to explore the use of lower carbon fuels in the future.

Q. WHAT IS THE IMPACT OF A DISALLOWANCE OF FUNDING OR IDENTIFIED PROJECTS FOR THE NEXT THREE YEARS OF DISTRICT SAFE?

A. Any disallowance of funding translates to forcing the Company to curtail and again defer critical safety work on leak prone and higher-risk facilities. Given the total volume of work that must be accomplished, any delay or reduction in work that can and should be accomplished now will increase the backlog of critical safety projects, threatening the integrity of the system, the reliability of service and the safety of the community.

Q. THE COMMISSION'S ORDER IN PARAGRAPH 51 ASKS THE COMPANY TO IDENTIFY COMPLETION TARGETS AND OTHER FORECASTED DATA. WHY IS THAT CHALLENGING?

A. The Company's ability to forecast out into the future is dependent on the Commission's support for long range planning, including authorization for the funding necessary to undertake significant and sustained capital work. However, the duration of the plans allowed by the Commission are shorter than many other jurisdictions, and the procedural process has twice resulted in disruption, rather than a seamless flow from one plan phase to the next. That being said, the Company's plan does provide forecasted targets based on Ms. Quarterman's assessment of the need to remove vintage materials more expeditiously and the District's goal to significantly lower Greenhouse Gas ("GHG") emissions prior to 2045. Ultimately, the Company's ability to achieve these goals, whether at the three year mark, the ten year mark, or the twenty year mark, is based on continued regulatory and financial relief.

VI. DISTRICT SAFE ALIGNS WITH THE DISTRICT'S CLIMATE GOALS

Q. HOW DOES DISTRICT SAFE HELP THE DISTRICT MEET ITS CLIMATE GOALS?

A. While the primary purpose of District SAFE is to ensure that the Company is able to continue to provide safe and reliable service to its customers, as described in the District SAFE Plan and supported in the testimony of Mr. Oliphant, removing leak-prone vintage materials in a prioritized manner will also reduce greenhouse gas emissions. Further, as shown in Section VII of the plan, removing all vintage materials would reduce operating emissions on the system by more than 90% from 2014 levels.

Q. WHAT LEAK REDUCTION BENEFITS DID THE COMPANY ACCOMPLISH THROUGH ITS REMEDIATION EFFORTS THROUGH DECEMBER 31, 2023?

A. Through its completion of accelerated replacement activities, and consistent with the Commission's findings in Formal Case No. 1137 that the Company's measures and methodologies regarding leak mitigation conform to industry and regulatory standards, Washington Gas has reduced GHGs from its District of Columbia distribution system by an estimated compounded cumulative total of 30,515 metric tons of carbon dioxide equivalent emissions (or CO2 equivalent).

Q. IN PARAGRAPH 48 OF ORDER NO. 22003, THE COMMISSION STATED THAT THE COMPANY'S "APPROACH MUST BALANCE THE NEED TO REPLACE LEAK-PRONE, HIGHEST-RISK PIPE SEGEMENTS…WHILE MINIMIZING THE STRANDED ASSETS..." HOW DOES THE DISTRICT SAFE PLAN ADDRESS THIS?

A. As described in Section VII(c) of the District SAFE Plan, the Company is

proposing the Customer Choice Pilot Program, which will create a notification and opt-out process to address the possibility that existing customers may intend to cease service with Washington Gas. The Company proposes to run this pilot for the next three years, with the possibility of permanently adopting the process if it proves successful. The Customer Choice Pilot Program attempts to balance the Company's need to ensure that its facilities are safe, with the Commission's concern regarding stranded assets. Specifically, the Company has proposed the following process:

- The Company will identify the location of the service lines that it plans to replace, via Company initiated projects in the District SAFE program, in years one and two of the program (*i.e.*, March 2025 through December 2026) within 60 days of the entry of an Order in District SAFE.

- Beginning with service lines planned to be replaced in year two, the Company will provide notification to the impacted customers via certified mail within 90 days of the date of the Commission's order that their location has been identified for a service line replacement in 2026. The cost of the certified mailing will be recovered through the rider.

- Customers scheduled to have service lines replaced via Company initiated projects in the District SAFE program in 2026 will have until December 1, 2025 to opt out. In order to opt out, the customer must: (1) affirm that they are the owner of the property; (2) indicate that they have converted their home to an alternative fuel source; and (3) terminate their Washington Gas service. When opt-out/termination occurs, services will be abandoned. Additionally, where present on the program list for a given year, premises with vintage service lines having no usage and no customer on record for 24 consecutive months or more will be abandoned. To the extent this meaningfully reduces the amount of work to be accomplished in a given Plan year, the Company will supplement its project list with additional risk-prioritized work.

- On a going forward basis, service line replacement locations, on Company initiated projects in the District SAFE program, will be identified 12 months in advance (i.e., service line replacements for 2027 will be locked in as of December 2025). Customers will be notified via certified mail, and will have approximately 11 months to convert and complete the opt-out process.

- Any customers that do not specifically opt-out of gas service and have not terminated their account will have their service line scheduled for replacement and replaced during the identified year.

Q. HOW DOES THIS PROPOSAL STRIKE THE APPROPRIATE BALANCE BETWEEN THE COMPANY'S NEEDS AND THE COMMISSION'S CONCERNS?

A. The proposal appropriately balances the practical realities at play within the District. The Company cannot wait indefinitely to do critical safety work. Service lines made from vintage materials present a significantly elevated risk due to the proximity of any leak to a dwelling. The Company must receive an affirmative indication, not just that the customer is exploring alternative fuels, but that the customer has actually undertaken the necessary work to terminate service. Finally, the opt-out process is necessary to confirm that the customer has the legal authority to make a decision about the physical service connection (i.e., a renter cannot indicate that the service should be removed from a property that they do not own) and that they have made and acted upon a decision (i.e., avoiding a situation where a property may be temporarily vacant with no active service, but where the owner does not have any plan for an alternative fuel source). Further, the Company is proposing advance notice to provide customers with an adequate amount of time to explore and complete any physical work required prior to the cutoff date. This advance notice also provides customers with the opportunity to explore available assistance. The Company notes that in the event of emergency work or work compelled by others, the Company will continue to replace or abandon the service line. Finally, the cutoff date is

necessary so that the Company can adjust plans, seek and obtain necessary permits, schedule crews, and have certainty surrounding the scope of work to be accomplished each year.

Q. HOW WILL THE IDENTIFICATION OF SERIVCE REPLACEMENTS MORE THAN A YEAR BEFORE THE COMPANY'S PROJECT YEAR IMPACT ITS PROJECT LISTS?

A. Identifying the intended service replacements more than a year before the Company would otherwise do so creates a staler project list that may not be fully responsive to newly incorporated data or field observations. While the Company does not believe that this reflects the best practice for ensuring that it is removing the most risk-prioritized pipe in the project year, the proposed pilot program seeks to address the Commission's specific objective of balancing safety with its concern regarding stranded assets. I would note that the Company is not currently aware of any data on its system that indicates there is a threat posed by stranded assets.

Q. HOW WILL THE COMPANY COORDINATE WITH INTERESTED STAKEHOLDERS AND THE D.C. GOVERNMENT, CONSISTENT WITH PARAGRAPH 51.L OF THE COMMISSION'S ORDER?

A. The Company will work collaboratively with interested stakeholders and the District government on the Customer Choice Pilot Program, as well as other opportunities that may benefit our customers, within the respectful and legal boundaries of our customers' right to privacy and to choose their fuel source. However, based on the Commission's language in Paragraph 47, that the District

is still working toward "the plans for full electrification" which are not yet solidified, and the information shared in the stakeholder meetings, further extensive discussion with stakeholders is needed to better understand what role Washington Gas can and should play in this process, what the cost impacts to its customers would be from any participation, and how that would ultimately be addressed through the Commission's ratemaking process.

VII. OTHER ELEMENTS IN ORDER NO. 22003

Q. IN ORDER NO. 22003, THE COMMISSION ENCOURAGED STAKEHOLDER ENGAGEMENT. DID THE COMPANY ENGAGE WITH STAKEHOLDERS?

A. Yes, the Company invested significant time and effort into engaging with interested stakeholders. Washington Gas organized and hosted a total of seven meetings during August and September with stakeholders – for a total of 14 hours of stakeholder meetings – in addition to individual meetings held in early July with representatives from DOEE/OAG and OPC, as well as other individual outreach. The stakeholder meetings covered a broad range of topics, with opportunity for questions and open discussion. Included with my testimony is exhibit WG (A)-2, which identifies the initial agenda for the stakeholder meetings and a list of organizations and individuals that were on the service list and participated in one or more meetings.

Q. DID THE STAKEHOLDERS ENGAGE IN DISCUSSIONS AROUND CRITICAL POLICY QUESTIONS?

A. Yes. The Company and other parties engaged with some of the challenging questions surrounding the energy future of the District. In particular,

the parties addressed the initial list of policy topics identified in the Commission's Order No. 22241. In addition, the Company sought to accommodate additional viewpoints to the extent the packed schedule would allow, and even dedicated one meeting for other parties to present on any policy topics they wished to discuss. In addition to the meetings, DOEE provided a list of policy issues on July 17, 2024 that they were interested in exploring. I have included as Exhibit WG (A)-3 the Company's thoughts on the relevance of those topics to this proceeding. While the Company is willing to continue having these important discussions, the identified topics and any other thorny and complex policy questions should not be a basis for delaying critical safety work, as Ms. Quarterman's testimony indicates and the May 13, 2024, PHMSA letter confirms.

Q. IN ORDER NO. 22003, THE COMMISSION DISCUSSED INFLATION REDUCTION ACT TAX INCENTIVES. HAS THE COMPANY EXPLORED AVAILABLE FUNDING UNDER RECENT FEDERAL PROGRAMS?

A. Yes. Prior to the issuance of the Commission's Order on June 12, 2024, the Company had already investigated whether any Inflation Reduction Act ("IRA") or other federal funding opportunities existed that would apply to the replacement of infrastructure in the District. The Company concluded that there are no federal funding opportunities that would achieve a cost reduction for customers that it qualifies for at this time. Washington Gas will continue to monitor federal agency activity, because, as described by Ms. Quarterman in her testimony, the federal government continues to prioritize and support the replacement of aging pipeline facilities.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

District SAFE PLAN

Figures

Tables

I. Introduction

The Washington Gas Light Company ("Washington Gas" or "Company") distribution system serving the District of Columbia ("the District") contains approximately 477 miles of main and 32,167 service segments[1] (or about 24,000 services)[2] made of vintage materials which the Pipeline and Hazardous Materials Safety Administration ("PHMSA") considers higher-risk pipeline infrastructure which must be replaced or retired. The Company's plan to accelerate the replacement of high-risk pipe is consistent with the recommendations of PHMSA in its 2011 Call to Action. The PHMSA Call to Action recommends the accelerated replacement of cast iron, mechanical couplings used for joining and pressure sealing pipe, steel pipe without adequate corrosion control (*i.e.*, cathodic protection or coating), copper, and vintage plastic.[3] These materials are prone to failure as a result of threats such as graphitization, or brittle fracture, mechanical joint failures, corrosion, stress corrosion cracking, settlement, or cyclic fatigue factor.

The District has approximately 393 miles of cast iron and 5 miles of re-conditioned cast iron main.[4] Additionally, the remaining identified high-risk pipe is made up of approximately 20 miles of bare steel, 53 miles of unprotected steel main, and approximately 11 miles of Vintage Mechanically Coupled ("VMC") main,[5] not including 12 miles of encapsulated VMC. Furthermore, the Company has 5,384 bare steel services,

[1] Service segments refer to a length of service pipeline with its own unique attribute.
[2] Source data: PHMSA 7.100 Report as of December 31, 2023. Count includes cast iron main, bare steel main and services, unprotected wrapped steel main and services, vintage mechanical coupling, and copper services. Count excludes pre-1975 plastic services.
[3] Plastic pipe manufactured in the 1960s to the early 1980s (the Company's system inventory for DC have these as pre-1975 plastics).
[4] The Company's total cast iron miles (including reconditioned cast iron) in the District is twelfth (12th) ranked among gas distribution companies in the country
[5] Protected Wrapped steel pipe that is 2" and less in diameter, installed between 1952 – 1956 and 1962 – 1965.

9,329 unprotected wrapped steel services, 9,095 copper services, and 718 vintage mechanically coupled services remaining in the District that must be replaced or removed.

In response to PHMSA's Call to Action on high-risk facilities, beginning in 2014, Washington Gas commenced its accelerated main replacement activity (*i.e.*, "PROJECT*pipes*" or the "PIPES Program"). As of the end of Calendar Year ("CY") 2023, the Company had reduced its leak prone and high-risk pipeline infrastructure by retiring 37.1 miles of main and remediating 8,403 services (including retiring 7,457 services). These improvements have contributed to an overall leak reduction of 28%[6] on the distribution system from 2019 to 2023. However, Washington Gas needs greater acceleration to outpace the overall aging of the system. Doing so will continue to drive down future leaks by replacing leak-prone outdated materials with modern materials, resulting in lower emissions. The District of Columbia Strategic Accelerated Facilities Enhancement ("District SAFE") Plan ("Plan") provides the roadmap for accomplishing this work. District SAFE will improve safety, reliability, and provide immediate, significant, and long-lasting emissions benefits.

This Plan provides a comprehensive overview of the Washington Gas system in the District and was designed based on the directives in the Public Service Commission of the District of Columbia's ("Commission" or "PSC") Order No. 22003, issued in Formal Case Nos. 1154, 1175, and 1179 on June 12, 2024 ("PIPES 3 Order"). The purpose of this Plan is to provide a wholistic roadmap for the accelerated replacement activities required in the District, as well as the analysis supporting the planned safety-focused

[6] Total leak counts in the District for mains and services combined from revised PHMSA F7.100 Reports filed on August 13, 2024, and the 2023 DOT Report.

activities for the nearly three-year period from March 1, 2025, through December 31, 2027.[7] The Company's District SAFE Plan, including the corresponding investment amounts, are described in this document. District SAFE will enhance public safety and ensure that the Company can provide its customers in the District with safe and reliable service.

II. The Washington Gas System in the District

a. Age of Facilities in the District

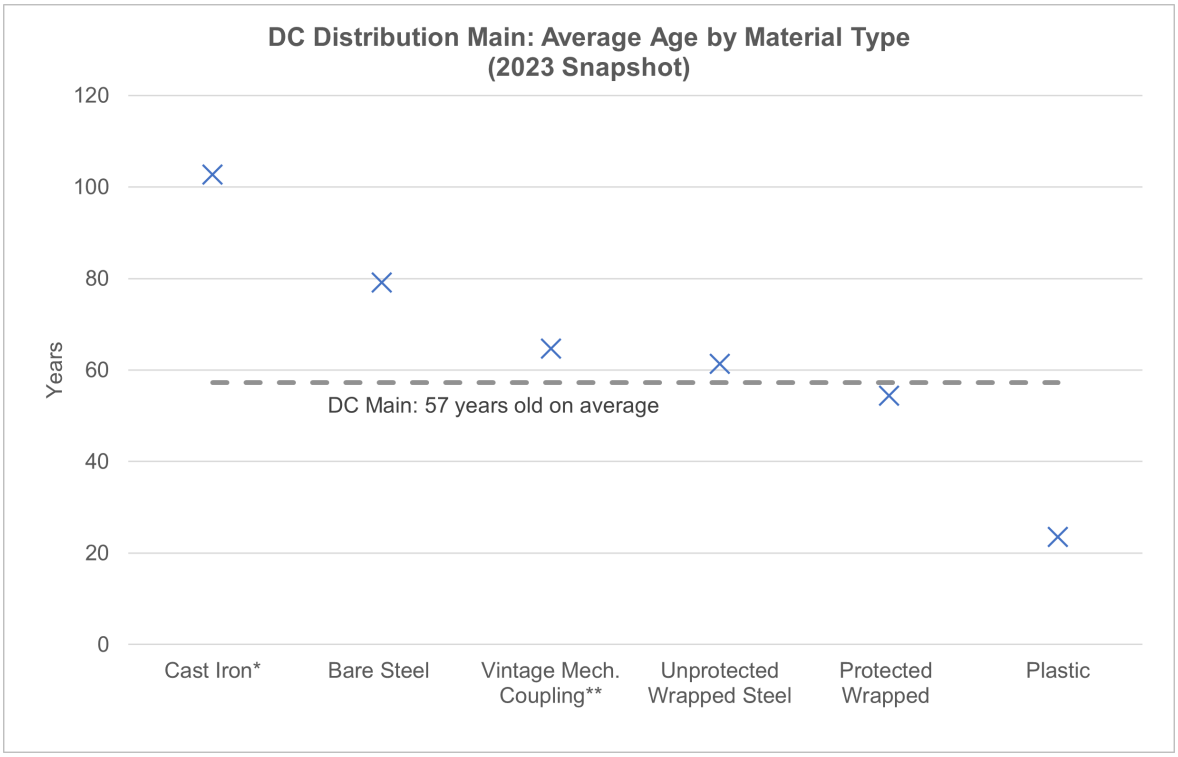
The initial facilities of the Washington Gas system were installed in 1848, more than 175 years ago. Since that time, the system in the District has grown to a total of 1,218 miles of main and 124,913 services.[8] These facilities provide service to approximately 165,000 District customers.[9] Given the long operational history of Washington Gas, the system is comprised of a mix of materials installed at different times over the last 175 years in accordance with the accepted best practices in effect at the time of construction and applicable regulations. As new materials and approaches to system designs evolved and became industry standards throughout the years, the Company adopted those materials and technologies. Now, however, there is universal federal safety and industry agreement that some of the early materials, such as cast iron, bare steel, unprotected steel, and techniques, such as the use of mechanical couplings,

[7] The Company proposes a two year and ten month plan so that it can adjust its plan to end of year to align with calendar year, which would create harmony with other similar reporting requirements, such as those required for DIMP.
[8] Approximately 160,697 service segments in total as of the end of calendar year 2023.
[9] In a gas utility, there are typically more customers than services because a single gas line can serve multiple customers within a household or building, meaning one service connection can provide gas to many individual appliances or units.

increase the risk associated with operating the system and, therefore, should be expeditiously replaced and retired.

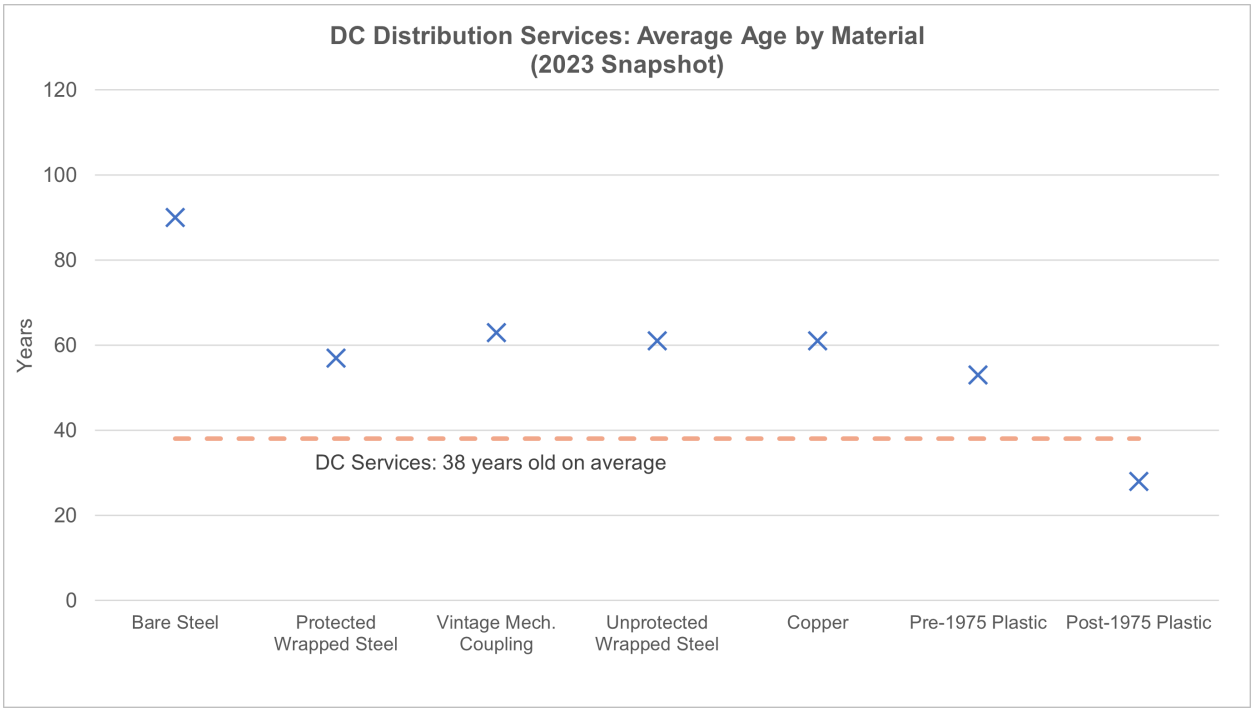
As of 2023, the average age of mains in the Washington Gas distribution system in the District is 57 years old. However, cast iron mains are the oldest in the District, with an average age of 103 years (see Figure 1). The average age of services in the District is 38 years. Bare steel services are the oldest in the District, with an average age of 90 years (*see* Figure 2). The difference in the average age of mains versus services is largely attributable to the timing of customer growth experienced by the Company in the District. The charts below highlight the key differences between the mains and services in the District. These charts also demonstrate that portions of the Washington Gas system are continuing to age.

Figure 1: Average Age of Washington Gas Distribution Main in the District



*Includes reconditioned cast iron
** Includes encapsulated VMC

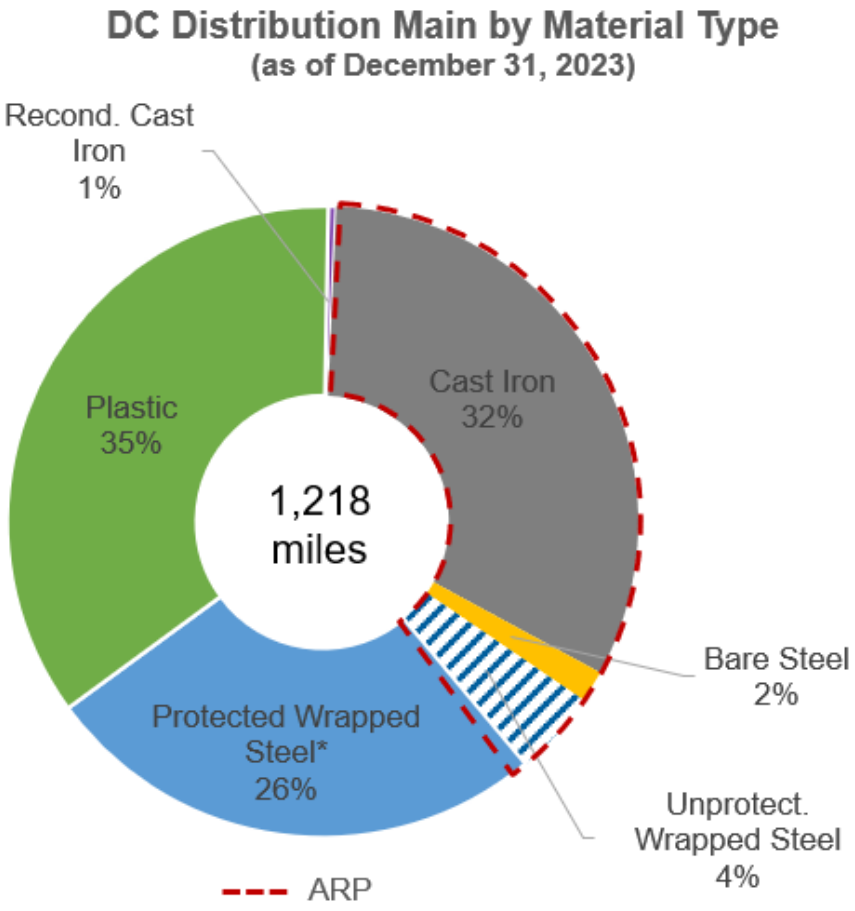
Figure 2: Average Age of Washington Gas Services in the District



b. Material Type of Facilities in the District

Washington Gas's system in the District is disproportionately comprised of an aging infrastructure that PHMSA has encouraged utilities to retire. Such materials include cast iron, bare steel, unprotected wrapped steel, protected wrapped steel including vintage mechanical coupled steel (*i.e.*, pre-1975 plastic). Figure 3 shows a snapshot of the total miles of Washington Gas main in the District of Columbia, by material type as of December 31, 2023, while Figure 4 shows the changes in material composition of the mains in the District over time since 2013. These identified materials emphasize the need to modernize the aging distribution system in the District, as these facilities pose a higher risk to safety and reliability, as well as increased emissions activity.

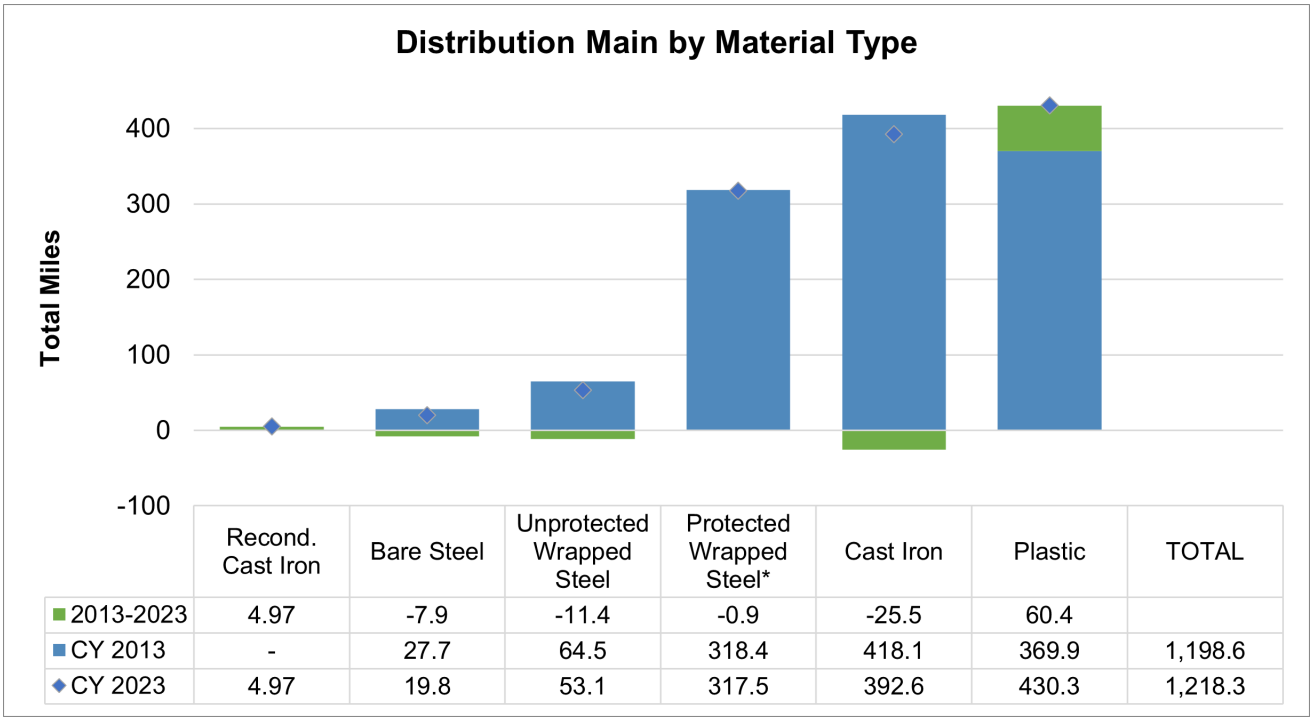
Figure 3: Total Miles of Washington Gas Main in the District by Material Type as of December 31, 2023[10]



*Protected wrapped steel includes vintage mechanical coupled wrapped steel and encapsulated VMC
Source Data: PHMSA 7.100 Report

[10] Washington Gas has approximately 5 miles of reconditioned cast iron main in the District which may be replaced if field conditions and/or risk model necessitates its replacement.

Figure 4: Change in Miles of Washington Gas Main in the District by Material Type (2013 to 2023)

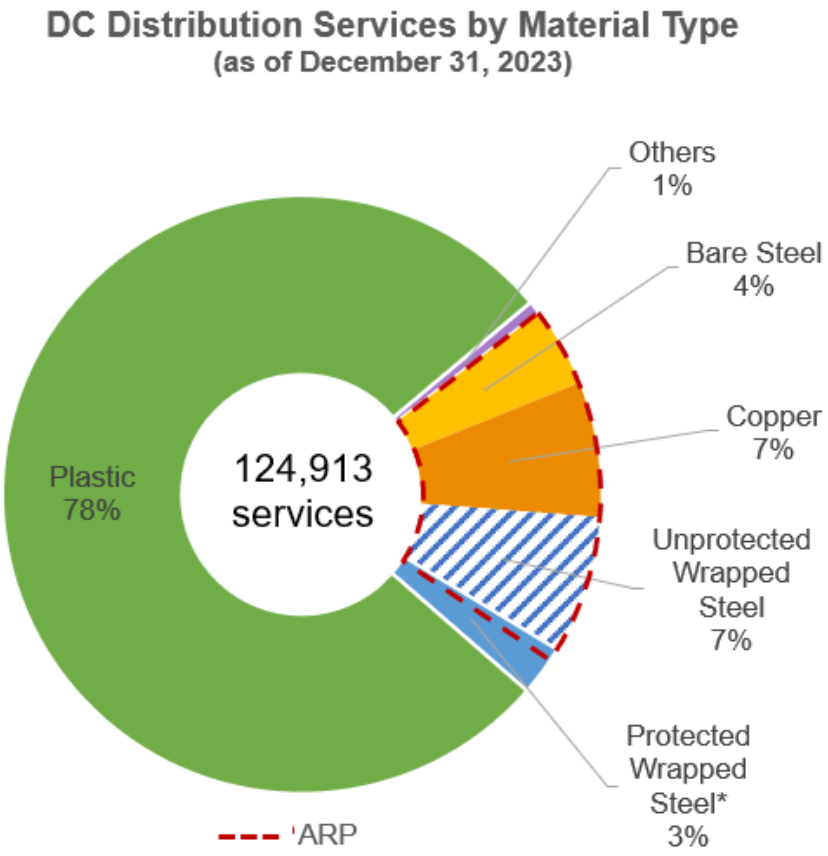


	Recond. Cast Iron	Bare Steel	Unprotected Wrapped Steel	Protected Wrapped Steel*	Cast Iron	Plastic	TOTAL
2013-2023	4.97	-7.9	-11.4	-0.9	-25.5	60.4	
CY 2013	-	27.7	64.5	318.4	418.1	369.9	1,198.6
CY 2023	4.97	19.8	53.1	317.5	392.6	430.3	1,218.3

*Protected wrapped steel includes vintage mechanically coupled wrapped steel and encapsulated VMC
Source Data: PHMSA 7.100 Report

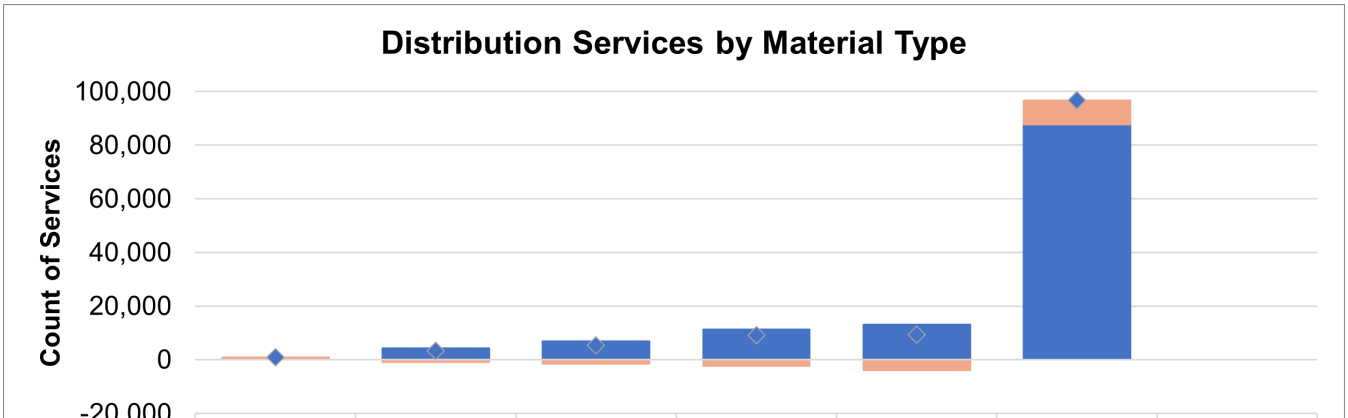
For services in the District, Figure 5 shows a snapshot of the total number of Washington Gas services in the District of Columbia by material type, as of December 31, 2023, while Figure 6 shows the changes in material composition of the services in the District since 2013. The remaining bare steel, unprotected wrapped steel, protected wrapped steel including vintage mechanical coupled steel, and copper services emphasize the need to completely modernize the distribution system in the District to significantly reduce risks to safety, enhance reliability and increase emissions reduction efforts.

Figure 5: Total Number of Washington Gas Services in the District by Material Type as of December 31, 2023



*Protected wrapped steel includes vintage mechanical coupled wrapped steel
Source Data: PHMSA 7.100 Report

Figure 6: Change in the Number of Washington Gas Services in the District by Material Type (2013 – 2023)



	Others	Protected Wrapped Steel*	Bare Steel	Copper	Unprotected Wrapped Steel	Plastic	TOTAL
2013-2023	897	-979	-1,524	-2,243	-3,832	9,058	
CY 2013	-	4,389	6,908	11,338	13,161	87,740	123,536
CY 2023	897	3,410	5,384	9,095	9,329	96,798	124,913

* Protected wrapped steel includes vintage mechanical coupled wrapped steel
Source Data: PHMSA 7.100 Report

III. Washington Gas Leak Data

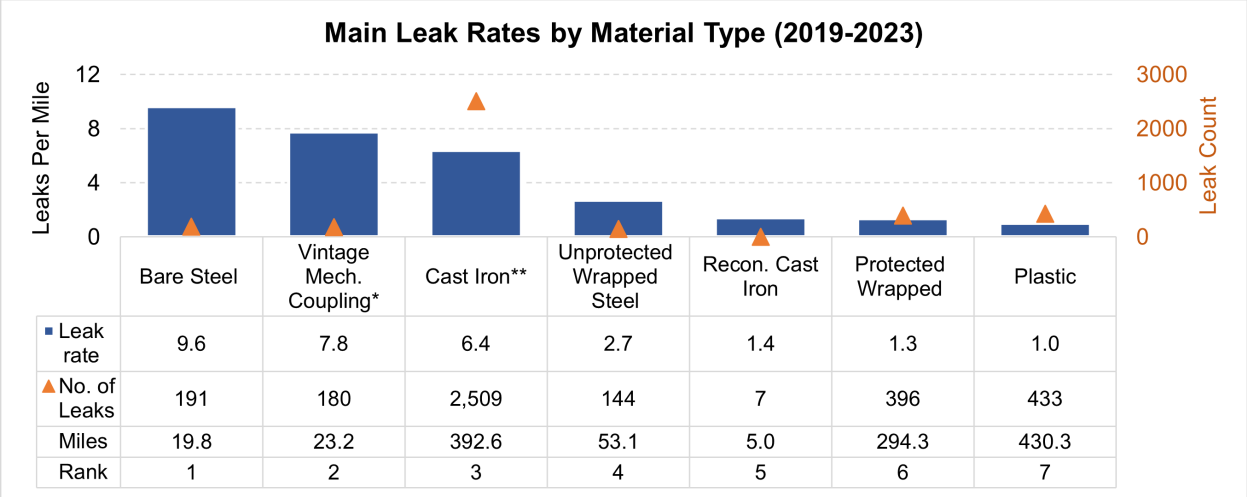
As a result of the age of these pipes and the nature of the materials, many of these facilities present a higher likelihood of leaks (*i.e.*, corrosion, joint failures, and cracking under well-known conditions that are regularly present in the District, such as heavy construction or ground movement). The below-ground leaks presented in the following figures from 2019 to 2023 for mains and services demonstrate threats associated with distribution pipeline risk in the District of Columbia. The threat categories assigned to leaks align with those found in the U.S. Department of Transportation (DOT 192 Subpart P). Pipe, weld, or joint failures and corrosion failures are the largest contributors to pipeline risk in the District's distribution system; the best method to achieve a reduction in this risk is the replacement of vintage infrastructure most vulnerable to these two

threats.[11] In fact, for mains, these material types (cast iron, bare steel, unprotected wrapped steel, vintage mechanical coupled) accounted for approximately 78% of all leaks on main pipe but make up only about 40% of the total main pipe on the system (see Figure 7).[12,13] It is important to note that bare steel presents the most reported and confirmed leaks per mile of main over a five-year evaluation timeframe (about 9.6 leaks per mile) compared to cast iron main with 6.4 leaks per mile on the same five-year evaluation period (2019-2023). From a safety and emissions reduction perspective, it is important to replace higher risk materials with the most reported and confirmed leaks per mile. As Figure 7 shows, these materials include bare steel, vintage mechanical coupling, cast iron and unprotected wrapped steel main.

Similarly for services in the District, bare steel, unprotected wrapped steel, vintage mechanical coupled wrapped steel, and copper services accounted for approximately 46% of all leaks on services but make up only 20% of the total number of service segments (see Figure 8). The highest leak rate per 100 service segments occurs on vintage mechanical coupled service segments (about 10.6 leaks per 100 service segments), followed by bare steel services with 6.9 leaks per 100 service segments, unprotected wrapped steel services with 2.8 leaks per 100 service segments, and copper services with 2.6 leaks per 100 service segments, all evaluated against the same five-year period (2019 – 2023).

[11] All leak grades and all repair methods (including Anaerobic Seal, Tighten Fitting, Greasing) were included.
[12] There are 3,024 leaks out of the total 3,860 leaks that are attributed to the ARP eligible main, including encapsulated VMC. There are 489 miles of ARP Main (including encapsulated VMC) out of a total 1,218 miles of main.
[13] Includes 12 miles of encapsulated vintage mechanically coupled main and their associated leaks.

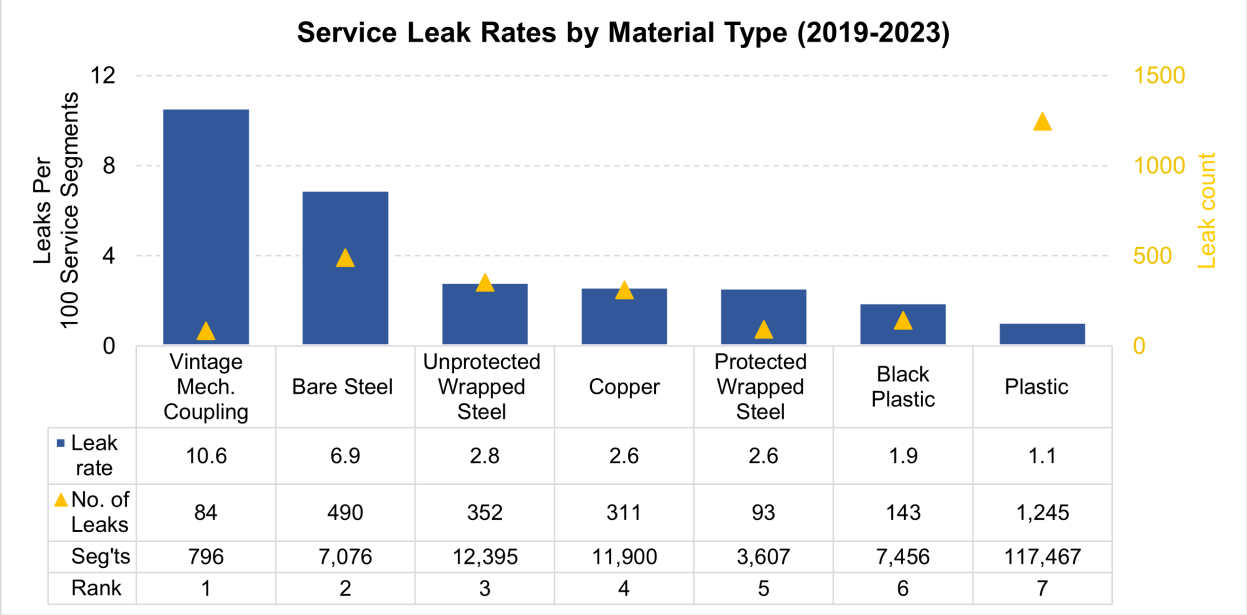
Figure 7: Main Leaks by Material Type (2019 – 2023)



	Bare Steel	Vintage Mech. Coupling*	Cast Iron**	Unprotected Wrapped Steel	Recon. Cast Iron	Protected Wrapped	Plastic
Leak rate	9.6	7.8	6.4	2.7	1.4	1.3	1.0
No. of Leaks	191	180	2,509	144	7	396	433
Miles	19.8	23.2	392.6	53.1	5.0	294.3	430.3
Rank	1	2	3	4	5	6	7

* Vintage mechanical coupled wrapped steel includes 12 miles of encapsulated VMC and associated leaks
** Cast iron includes reconditioned cast iron and associated leaks

Figure 8: Service Leaks by Material Type (2019 – 2023)



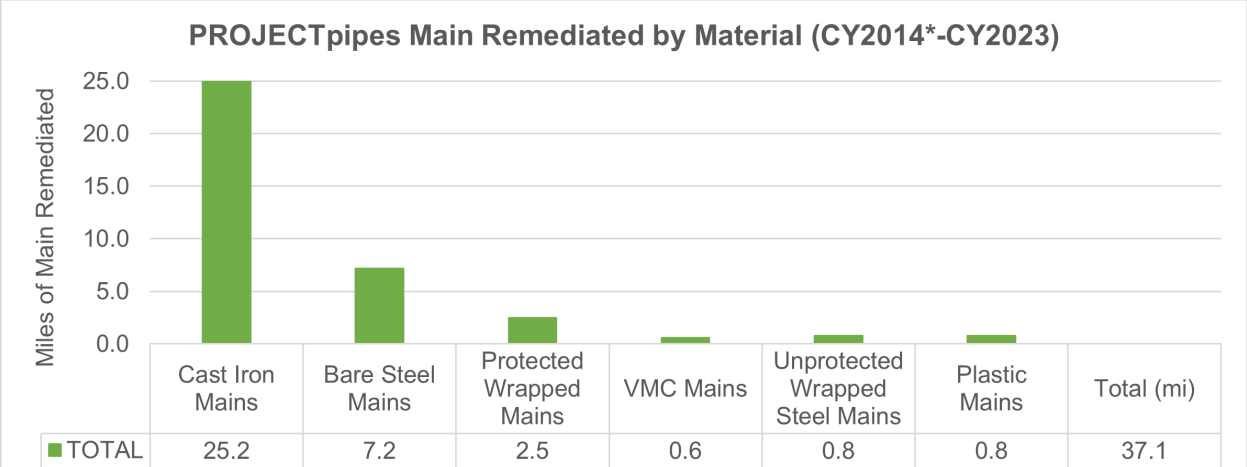
	Vintage Mech. Coupling	Bare Steel	Unprotected Wrapped Steel	Copper	Protected Wrapped Steel	Black Plastic	Plastic
Leak rate	10.6	6.9	2.8	2.6	2.6	1.9	1.1
No. of Leaks	84	490	352	311	93	143	1,245
Seg'ts	796	7,076	12,395	11,900	3,607	7,456	117,467
Rank	1	2	3	4	5	6	7

IV. PROJECT*pipes* Performance

Beginning in June 2014, Washington Gas commenced its PIPES program. The objective of the PIPES program has been to target and replace high-risk main and services on an accelerated basis in order to eliminate the aforementioned materials from the system within 40 years. During the ten completed years of the PIPES program, the Company achieved the mileage reductions and service remediations shown in Figure 9 and Figure 10 below. These show a total of 37.1 miles of main retired and 7,457 total services retired from June 2014 through December 31, 2023. Cast iron, bare steel, unprotected wrapped steel, and VMC alone account for 91% of replaced miles of main, while bare steel, unprotected wrapped steel, VMC, and copper account for 73% of services retired. As of 2023, the Company must ultimately replace or retire[14] about 477 miles and 24,526 services in the District to continue to maintain a safe and reliable system.

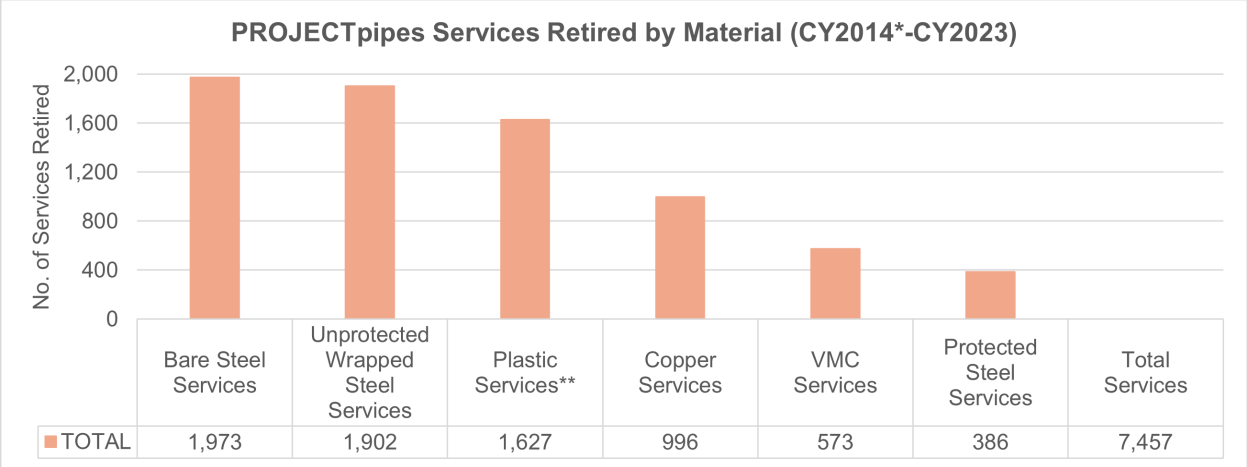
[14] Specifically, the Company's risk prioritization process will evaluate the presence of existing eligible pipe that can be retired without any service impacts to customers.

Figure 9: Total Miles of Main Replaced Under PROJECT*pipes* by Material



Total Main Remediated by Material (mi)	PIPES 1							PIPES 2			Total
	2014*	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Cast Iron	1.7	1.2	1.4	2.0	2.1	2.7	1.9	5.1	3.3	3.8	25.2
Bare Steel	0.4	2.2	0.9	0.2	0.5	0.6	0.2	0.9	1.1	0.2	7.2
VMC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
Unprotected Wrapped	0.0	0.2	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.8
Protected Wrapped	0.0	0.1	0.1	0.2	0.2	0.0	0.8	0.3	0.5	0.2	2.5
Plastic	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.8
Total	2.1	3.7	2.6	2.5	2.8	3.5	3.1	6.6	5.2	5.0	37.1
*PROJECT*pipes* began in June 2014											

Figure 10: Number of Services Retired Under PROJECT*pipes* by Material



No. of Services Retired by Material	PIPES 1							PIPES 2			Total
	2014*	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Bare Steel	79	251	124	125	120	199	152	217	287	348	1,902
Unprotected Wrapped Steel	49	298	156	125	117	261	105	131	300	431	1,973
VMC	13	22	8	39	16	2	8	51	170	244	573
Copper	28	63	64	60	27	22	11	133	230	358	996
Protected Wrapped Steel	52	30	22	32	32	23	11	33	41	110	386
Plastic**	179	194	171	110	97	187	76	169	192	252	1,627
Total	400	858	545	491	409	694	363	734	1,220	1,743	7,457

*PROJECT*pipes* began in June 2014
**Includes pre-1975 (black) plastic and Aldyl-a (pink) plastic

V. The District is a National Outlier Regarding Main Replacement Activity

a. Call to Action and Cast Iron Replacement

Since the U.S. Department of Transportation and PHMSA issued the Call to Action to accelerate the repair, rehabilitation, and replacement of the relatively higher-risk pipeline infrastructure such as cast iron, vintage plastic,[15] mechanical couplings used for joining and pressure sealing pipe, bare steel pipe without adequate corrosion control (*i.e.*,

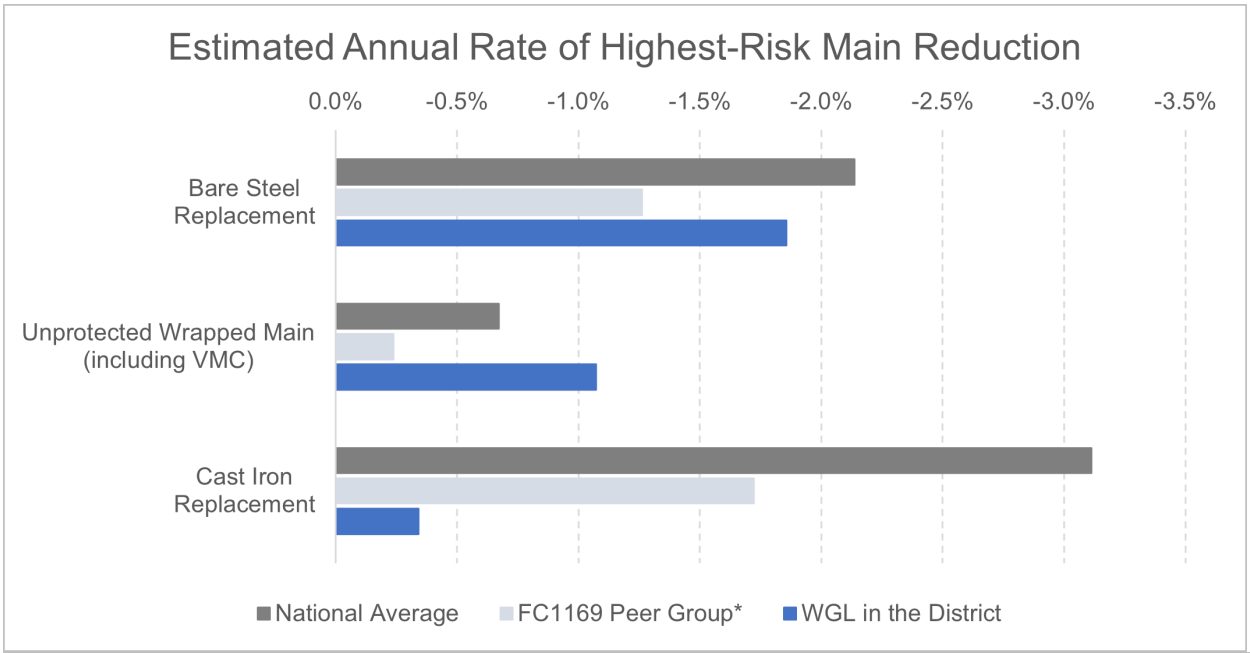
[15] Plastic pipe manufactured in the 1960s to the early 1980s.

cathodic protection or coating), and copper, the cast and wrought iron distribution main mileage has decreased significantly across the country. Nationally, these materials have decreased by 60 percent from 2005 to 2023. In fact, 24 states and 1 territory have completely eliminated cast and wrought iron gas distribution pipelines.[16] All remaining states where cast and wrought iron are present are engaged in programs that support accelerated replacement activities and have accelerated cost recovery mechanisms or alternative ratemaking that incorporates future infrastructure investments into base rates in order to support the continuous progress toward eliminating all of the high-risk materials.

In alignment with the Call to Action, cast iron replacements have accounted for about 68% of overall milage of main replaced in PROJECT*pipes* over 10 years. Out of 37.1 miles of main replaced in PROJECT*pipes* (see Figure 9 above), approximately 25.2 miles was cast iron. A much more accelerated replacement pace for the remaining approximately 393 miles of cast iron main will be required, given the current estimated annual PROJECT*pipes* reduction rate of 0.3% compared to the national average annual reduction rate of about 3.1% (replacing over 15,000 miles of cast iron main over the same 10-year period), as shown in Figure 11 below.

[16] According to the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), twenty-four states and one territory have completely eliminated cast or wrought iron natural gas distribution lines within their borders, Alaska, Arizona, Arkansas, Colorado, Hawaii, Iowa, Idaho, Kansas, Mississippi, Minnesota, Montana, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Puerto Rico, South Carolina, South Dakota, Utah, Vermont, Washington, Wisconsin, and Wyoming. https://www.phmsa.dot.gov/data-and-statistics/pipeline-replacement/pipeline-replacement-background

Figure 11: Comparison of the District of Columbia's Cast Iron, Bare Steel, and Unprotected Wrapped Steel Main with Peer Group and National Averages Between 2013 and 2023



Relatively higher-risk main	Bare Steel Replacement			Unprotected Wrapped Steel Main Replacement			Cast Iron Replacement		
	WGL in the District	FC1169 Peer Group*	National Average	WGL in the District	FC1169 Peer Group*	National Average	WGL in the District	FC1169 Peer Group*	National Average
2013 miles	28	762	38	65	868	11	418	1,113	21
2023 miles	20	606	26	53	831	10	393	814	12
% of total main inventory (2023)	1.6%	3.3%	0.002%	4.4%	4.6%	0.001%	32.3%	4.5%	0.001%
Annual reduction rate (est.)	-1.9%	-1.3%	-2.1%	-1.1%	-0.2%	-0.7%	-0.3%	-1.7%	-3.1%

Source Data: PHMSA 7.100 Report.
Notes: Washington Gas peer group selected in Formal Case No. 1169. Peer Group includes Baltimore Gas and Electric Company (Baltimore), Pacific Gas and Electric Company (San Francisco), Boston Gas Company (Boston), Consolidated Edison (New York City), Philadelphia Gas Works (Philadelphia), Peoples Gas Light and Coke Co (Chicago), and Southern California Gas Company (Los Angeles).

Figure 11 also recognizes that the Company's rates of replacement for unprotected wrapped steel main and the bare steel main in the District are above and on par with the

estimated rates of annual reduction for those national averages, respectively. This comparison across cast iron, bare steel, and unprotected wrapped steel main demonstrates two things. First, it shows that the Company's consistent risk reduction framework adopted to replace materials with the highest leak rates or higher risk ranking since the beginning of PIPES has effectively accelerated the replacement of those materials above the industry pace. Second, the comparison emphasizes the need for further accelerated replacement, even compared to the similarly situated utilities identified in Formal Case No. 1169 that experience operating challenges comparable to those in the District.[17]

b. Washington Gas Cost Comparison to FC1169 Peer Group

Washington Gas proposed a peer group in Formal Case No. 1169 of companies that exist in densely populated urban environments and have cast iron and/or bare steel, mains within their current systems. The PHMSA data does not allow for a full like-to-like cost comparison solely based off the high-level data sets available; however, the Company was able to draw some comparisons from case filings. For instance, as shown in Table 1 below, a comparison of Accelerated Replacement Programs Annual Spend and Cost per mile in Maryland and New York jurisdictions show the Company's costs are in line with peers for work completed in the District.

[17] Formal Case No. 1169, *Washington Gas Rebuttal Testimony by Company Witness Townsend* (January 6, 2023) and *Washington Gas's Rejoinder Testimony of Company Witness Townsend* (June 28, 2023).

Table 1: Comparison of Accelerated Replacement Programs Annual Spend and Cost per Mile in Maryland and New York

Company	Consolidated Edison (Manhattan)[18], [19]	Washington Gas (District of Columbia)[20]	Baltimore Gas[21]	Washington Gas (Maryland)[22]
Data year considered	2022	2023	2023	2023
Program Name	N/A	PIPES	STRIDE	STRIDE
Case No.	19-G-0066	FC 1154	CN 9468	CN 9486
Company acronym	Con-Ed	WG	BGE	WG
Jurisdiction	NY	DC	MD	MD
Most recent total ARP spend ($)	**$488,623,452**[23]	**$72,386,826**	**$132,085,523**	**$73,871,165**
Most recent total ARP spend on main replacement projects ($)	**$94,115,985**	**$39,329,301**	**$102,999,068**	**$36,362,881**
Most recent average cost per mile for main ($/mi)[24]	**$10,457,332**	**$7,891,681**	**$6,623,331**	**$3,066,245**

c. District Policies Play a Significant Role in the Cost and Pace of Replacement Activities

Many District policies have contributed to the slower rate of accelerated pipe replacement and the higher-than-national average cost per mile experienced by Washington Gas. The Company encounters operating restrictions imposed by various authorities in the District of Columbia that have impacted its ability to complete main and

[18] This does not include the work completed in Queens, the Bronx, or Westchester which was replaced at $4.8 million/mile, $5.7 million/mile, and $3.9 million/mile respectively.
[19] Case No. 19-G-0066, Con Ed Capital Reporting Requirements Year End 2022 Report (February 28, 2023).
[20] Formal Case No. 1154, Washington Gas's Annual Project Reconciliation Report (April 1, 2024).
[21] Case No. 9468, BGE STRIDE Program and Project Cost Variance Information; BGE STRIDE Rate True-Up Information (March 15, 2024).
[22] Case No. 9486, MD STRIDE 2023 Annual Report (March 15, 2024).
[23] Includes ARP spend across Manhattan, Queens, the Bronx and Westchester
[24] Includes all costs for affected service replacements/transfers associated with the main replacement. Washington Gas notes that backing into the cost per mile is unlikely to reflect the actual cost per mile, because it does not readily distinguish significant cost-driving variables due to project type (e.g., main versus service replacement) or the impacts from local work rules.

service replacements quickly and in a cost-effective manner.[25] These operating restrictions have increased in prevalence and impact over the last decade, and include, but are not limited to, restrictive road occupancy time limits and extensive paving requirements. Table 2 below shows eleven (11) different operating restrictions that have impacted the Company's replacement activities in the District, enacted in just the last few years, including the responsible authority and start date.

Table 2: Operating Restrictions Impacting Washington Gas Costs with Corresponding Authorities and Enactment Year

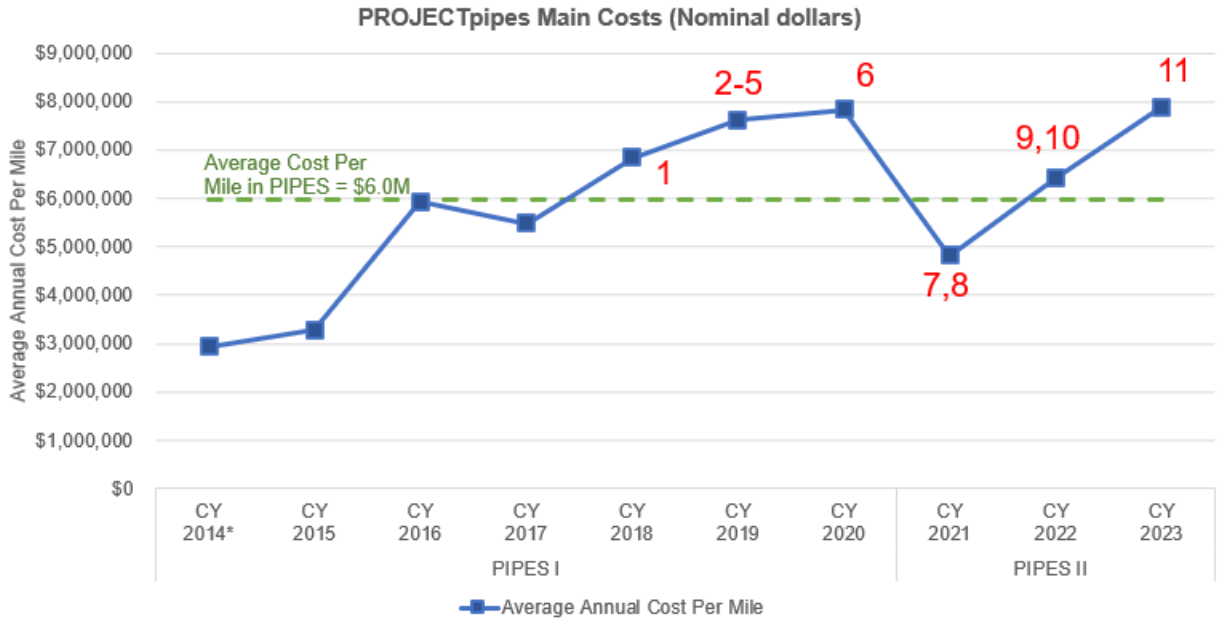
	Description of Operating Restrictions	Authority	Year
1	Restricting Work Hours 9:30am – 3:30pm	DDOT	2018
2	Site Specific Traffic Control Plan ("TCP")	DDOT	2019
3	1 Crew Per Work Zone	DDOT	2019
4	Main install in Roadway Mandate	Urban Forestry	2019
5	Chain Linked Fence and Hand Digging Around Trees Mandate	Urban Forestry	2019
6	Construction Drawing Detail Requirements	DDOT	2020
7	Traffic Control Plan 6-Month Term Requirement	DDOT	2021
8	1,200 Foot Trench Restriction	DDOT	2021
9	300 Foot Work Zone Requirement	DDOT	2022
10	Page Limits on Traffic Control Plan(s)	DDOT	2022
11	Paving-Specific Traffic Control Plans[26]	DDOT	2023

Figure 12 below provides the variation between actual average spend per mile retired per year versus the average PROJECT*pipes* spend per mile retired since the program began. These costs per mile are fully loaded, and include all associated service replacements, transfers, and final paving and restoration associated with the

[25] FC1154-2024-G-421: *Washington Gas – Response to Notice of Commissioner Beverly* (January 17, 2024).
[26] Refers to District Department of Transportation ("DDOT") requirement to end the use of already approved Construction Traffic Control Plans for paving, requiring the Company to develop *additional* Paving-Specific Traffic Control Plans.

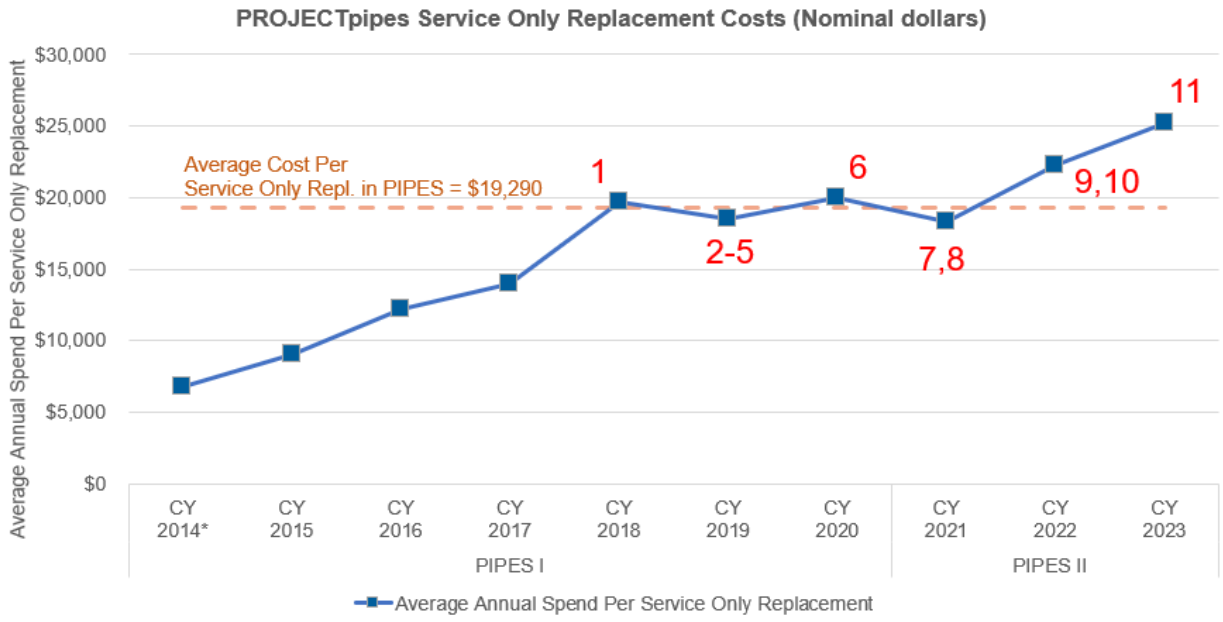
main install and retirement. Figure 13 provides the same information for the services remediated under service only replacements in the accelerated replacement program, including final paving and restoration costs. External constraints are also overlayed in Figure 12 and Figure 13 showing when the recent restrictive requirements were implemented by the District.

Figure 12: Comparison Between Annual Nominal Average Cost Per Mile Retired and overall PROJECT*pipes* Average Cost Per Mile Retired



Note: Chart is overlayed with operating restrictions 1-11 in Table 2 above that have impacted the Company's ability to cost effectively deliver main and service replacements over time.

Figure 13: Comparison Between Annual Nominal Average Cost Per Service Only Replacement and Overall PROJECT*pipes* Average Cost Per Service Only Replacement



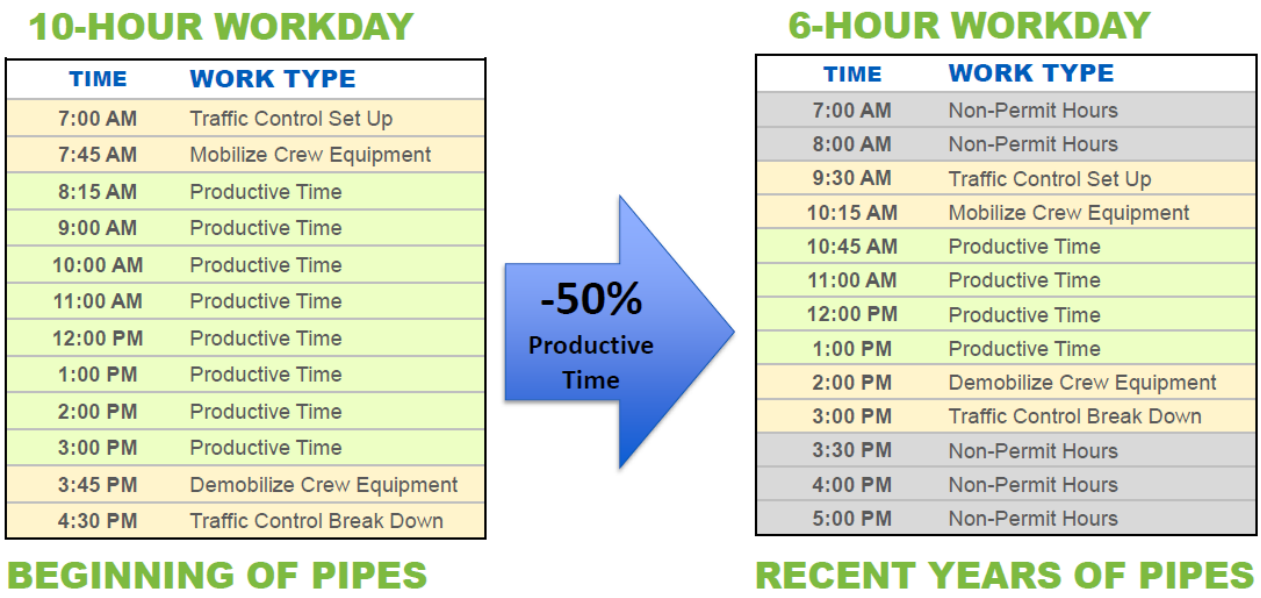
Note: Chart is overlayed with operating restrictions 1-11 in Table 2 above that have impacted the Company's ability to cost effectively deliver main and service replacements over time.

d. Work Hour Restrictions Significantly Impact Cost and Pace

Washington Gas has a very limited construction window in the District. The Company previously identified a number of changes and enforcement in policy and regulation by DDOT which have significant impacts on the level of productivity and costs associated with the construction work under the accelerated program, including restrictions on work hours resulting from the shortening of a typical 10-hour workday to a 6-hour workday. The work hour restriction is one of the major drivers of Washington Gas's increasing cost per mile of main and slow progress on main replacement activities. Prior to 2018, PIPES projects were faster to complete due to longer working hours – up to 7am to 7pm on local roadways enabling approximately eight productive hours per day, as

shown in Figure 14. These longer work hours allowed crews to complete more work in the same day, shortening the duration of each project. Today, the restricted hours limit work to between 9:30 am and 3:30 pm, resulting in approximately four (4) crew productive hours per day. Service replacements now average over two (2) working days rather than the one day they took prior to 2018, and thereby also increase support costs such as traffic control.[27] The restricted work hours cause a higher nominal spend per mile of main replaced. DDOT does not apply this limited work hour rule across all entities in the District, and specifically does not apply this rule to its own road work. As such, the Company has and will continue to actively engage with DDOT seeking longer working hours that would directly contribute to lower project costs and a faster pace.

Figure 14: Summary of Restricted Work Hours[28]



Note: 'Beginning of PIPES' refer to June 2014 until 2018 and 'Recent years of PIPES' refer to post-2018

[27] FC1154 - 2021 - G - 195: *Technical Conference Report on Lowering PROJECTpipes Unit Costs* (May 19, 2021).
[28] Cost Driver 1. Restrictions on Work Hours as an uncontrollable cost driver directed or influenced by external factors (i.e., jurisdictional requirements) that dictate the Company incur additional expenses

e. The Cumulative Effect of Other DDOT Restrictions Imposed Since 2018 Has Consistently Added Costs and Time Delays to Projects

Additional DDOT changes include a requirement for multiple occupancy permits, a smaller scope per permit, and shorter permit durations, as well as the requirement to arrange for bicycle and pedestrian traffic flow on the same side of the roadway as the construction site. DDOT has also limited the use of site-specific construction TCPs for paving and reduced the work zone to 300 feet, including all traffic control measures. All of these constraints have resulted in increased costs to the Company, reduced productivity of work crews and longer time periods to complete required work.

Significant changes have also been imposed by Urban Forestry to increase protection of trees in proximity to a construction work area. Chain link fences, rather than the previously used orange flexible fencing, are now required for all trees in a work zone, necessitating additional equipment for set up and removal, which in many cases is performed by a separate crew. This requirement not only increases costs for the equipment but adds additional labor costs to the project. Crews are also compelled to hand-dig or vacuum excavate around tree roots near a drip line, and these more stringent rules have increased the amount of time it takes to complete the work. There are also added costs for the specialized vacuum excavation equipment, which contributes to the overall increase in project costs. Moreover, changing permit requirements to avoid installing facilities in the grass area between the curb and sidewalks (*i.e.*, the green space behind the curve) have caused crews to perform pipe replacements in the roadway instead, which has considerably raised costs associated with increased saw-cutting preparations, spoils, traffic control and restoration. DDOT also requires 100% select

backfill in the roadway, which increases costs, compared to allowing facilities to be installed in the green space and utilizing suitable excavated material for backfilling.[29]

As a result of these recently enforced policies and practices, and the lack of flexibility in the PROJECT*pipes* budget to increase in order to accommodate higher project costs, Washington Gas made limited progress in reducing the total vintage materials on its system. Since the commencement of the PIPES Program, the Company has retired a total of 37.1 miles of main and replaced/retired 7,457 services (a total of 8,403 services were remediated, i.e., either replaced, transferred, or abandoned). These retirements reflected approximately 7% of miles of main and about 23% of services retired or replaced, rather than the approximately 25% of each that needed to be retired or replaced in order to be on target for the 40-year removal timeline. These retirements are necessary to enhance safety, improve reliability and to lower emissions. However, this historic pace is not sufficient to expeditiously retire or replace the aging infrastructure and leak-prone materials from the system.

f. Efforts to Improve Cost Effectiveness in the District

The Company has and will continue to take actions that may control costs where it is able to do so. Washington Gas has committed to significant stakeholder involvement with DDOT, participating in monthly meetings and other ongoing discussions, to advocate for changes in some of the impactful rules and regulations previously identified that would lead to lower costs through longer crew work hours and lower administrative burdens, and improve the pace of productivity for the benefit of the District of Columbia ratepayers.

[29] See the Direct Testimony of Company Witness Jacas for additional information on cost drivers and restrictions imposed in the District.

In addition, the Company is looking to explore opportunities to partner with other entities in the District undertaking significant infrastructure work, where it may be possible to share some of the costs (e.g., paving) that would otherwise be borne entirely by Washington Gas. Washington Gas's Accelerated Replacement Proposal

The Company proposes one overarching program comprised of projects selected based on the system risk-reduced-per-dollar spent, consistent with the Commission's Order, with replacement activity reporting focused on six (6) sub-categories of identified assets. The District SAFE program will use a risk-based approach to identify main and service replacements across the District, seeking to remove as much risk as possible with the dollars made available each program year. This program will capture the total accelerated replacement activity for each of the eligible facilities. Table 3 below shows the proposed strategy for each asset type to be fully replaced or assessed for retirement.

Table 3: Proposed Asset Quantity and Strategy in Washington Gas's District SAFE Program[30]

Program	Leak Rate Rank	Asset Type	Proposed Strategy	Estimated Remaining 2023 Main and Services
Distribution Main	1,4	Bare and/or Unprotected Wrapped Steel Main[31]	Replace bare steel and unprotected wrapped steel mains, including contingent main[32] and affected services.[33]	20 miles of bare steel main and 53 miles of unprotected steel main
	3	Cast Iron Main[34]	Retire or replace cast iron mains, including contingent main and affected services.	393 miles of cast iron, not including 5 miles of reconditioned cast iron
	2	Vintage Mechanically Coupled Wrapped Steel Main and Services[35]	Replace vintage mechanical coupled wrapped steel main and services, including contingent main and affected services.	11 miles of VMC, not including 12 miles of encapsulated VMC main, and 718 VMC services.
Distribution Services	1			
	2,3	Bare and/or Unprotected Wrapped Steel Services[36]	Replace bare steel and unprotected wrapped steel services.	5,384 bare steel services and 9,329 unprotected wrapped steel services
	4	Copper Services[37]	Replace copper services.	9,095 copper services
Total	ARP 2023 eligible main (as of December 31, 2023)			**477 miles of main**
	ARP 2023 eligible services (as of December 31, 2023)			**32,167 service segments**

Note: The above leak rate ranks are based on a five-year evaluation period from 2019 to 2023 (see Figures 7 and 8 in Section III. Washington Gas Leak Data)

[30] These includes potential units identified for replacement by direct field operations assessment (observation) and work compelled by others (DDOT).
[31] Previously Program 2.
[32] Contingent main refers to instances where non-program specific main materials (i.e. pre-1975 Plastic, Protected Wrapped Steel, etc.) are encompassed within the bounds of program eligible materials and logically group with program eligible main for replacement.

[33] Affected services (i.e. pre-1975 Plastic, Protected Wrapped Steel, Copper, *etc.*) will be replaced when exposed and connected to a portion of main that is being replaced in the program.

[34] Previously Program 4.
[35] Previously Program 3.
[36] Previously Program 1.
[37] Previously Program 5.

VI. Forecasted Replacement Activity in District SAFE

As part of District SAFE, Washington Gas is proposing one primary program, encompassing all of the previously approved sub-programs, and will identify annual project lists on a risk reduced per dollar spent basis to maximize the reduction of risk, and, therefore, improve safety on the distribution system. The Company will use its currently implemented risk model (*e.g.*, JANA Lighthouse) to prioritize and establish the annual project list that can be accomplished within the annual program budget identified in Table 4.

Table 4: District SAFE Replacement Program Funding

Year	Program Funding
2025[38]	$50,000,000
2026	$75,000,000
2027	$90,000,000
Total	**$215,000,000**

As discussed in Company Witness Jacas' Direct Testimony, annual program funding was set at a feasible level based on 2024 construction levels and desire to increase the pace of replacement. Washington Gas has developed an estimate for the miles likely to be replaced. As described in greater detail in Section III: Washington Gas Leak Data and Table 3 of the Plan, the mileage reflected in Table 5 below is a preliminary estimate. Following the previous Commission approved process, the final project list will be submitted by October 31st annually for the following year's construction activities,[39]

[38] District SAFE CY 2025 covers 10 months of work and expenditures from March 1, 2025, to December 31, 2025.
[39] Project lists in years 2 and 3 to be submitted in accordance with Order No. 20773.

which provided the estimated total scope of work with costs along with the estimated scope of work and funding to be completed in the proposed calendar year.

Table 5: Preliminary District SAFE Mileage and Service Replacement Forecast (2025 – 2027)

Year Starting	Estimated Miles of Main	Estimated Services Relaced / Remediated		
		Service Only Repl.	Service Repl. with Main	Service Transfers[40]
CY 2025[41]	2.2	1,036	155	39
CY 2026	2.5	1,298	217	116
CY 2027	7.7	278	624	399
Total	**12.4**	**2,612**	**996**	**554**

VII. District SAFE Supports the District's Clean Energy Future

As ordered by the Commission,[42] the Company included consideration of the District's climate policies, including the District's ambitious target of becoming carbon neutral and climate resilient by 2045, with an accelerated mandate to achieve carbon neutrality in District Government operations by 2040.[43] To be clear, carbon neutral is not synonymous with electrification. Natural gas consumption in the District in the Buildings and Energy sector continues to account for much lower total GHG emissions and lower combustion-related emissions per energy unit profile than electricity's associated emissions in the same sector.[44]

[40] Service Transfers are estimates and could change during final engineering design and during construction.
[41] Year 1 will cover 10 months, March 1, 2025, through December 31, 2025.
[42] Formal Case No 1179, Order No. 22241 (July 26, 2024).
[43] https://doee.dc.gov/service/climate-change
[44] Based on the District's Department of Energy & Environment (DOEE) 2006-2021 Greenhouse Gas Inventory, https://doee.dc.gov/service/greenhouse-gas-inventories. In 2021, natural gas consumed by the residential and non-residential building & energy sector accounted for 1,434,345 MTCO2e (~21% of total)

The main replacement activities proposed in District SAFE will provide the Company and the District with greenhouse gas ("GHG") emissions reduction benefits. Nationally, main replacement activities are considered one of the most effective methods for reducing a utility's direct operational emissions and providing long-lasting, year over year emissions reductions, while also directly improving safety and reliability.

a. GHG Emissions Reductions through PROJECTpipes (CY2014-2023)

Through PROJECT*pipes*, the Company estimated a compounded cumulative total greenhouse gas (GHG) emissions reduction of 30,780 metric tons of carbon dioxide equivalent from CY2014 – CY2023, with the most reduction contributions from cast iron, bare steel, and unprotected steel main and services.[45] (See Figures 15 and 16 below). Cumulatively without compounding, the distribution piping emits 6,873 metric tons of carbon dioxide equivalent emissions less in 2023 than it did in 2014 (i.e., total annual emissions attributed to the retired and replaced piping is 6,873 metric tons lower) as shown in Table 6 below. In other words, since PROJECT*pipes* launch in 2014 through 2023, replacing older pipe with modern pipe in the District has enabled an average annual reduction of approximately 690 metric tons of carbon dioxide equivalent emissions (Table 6 below).

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while electricity consumed by the same sector accounted for 3,014,885 MTCO2e (~45% of total). On a per energy unit basis, natural gas emissions per energy consumed implies 181.5 kgCO2e/MWhe (1 therm ≈ 29.3 kWhe) versus 306.6 kgCO2e/MWhe for electricity (as noted by DOEE, both emission factors do not capture upstream impacts). Even local transmission and distribution losses for gas represented as fugitive emissions relative to total consumption is about 11.4 kgCO2e/MWhe while that of electricity represented by grid losses relative to the same Building & Energy sector consumption is about 16.3 kgCO2e/MWhe.

[45] This is based on 10-year compounded estimates for replacing 37.1 miles of main and 7,457 services that were retired from CY14-CY23. These include only retired main footage and services, it does not include change overs or transfers. According to the U.S. Environment Protection Agency, this reduction is equivalent to removing over 7,300 gasoline-powered passenger vehicles driven for one year. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

Figure 15: Estimated Emissions Reductions from Main Replaced Under PROJECT*pipes* by Material (CY2014 - CY2023)

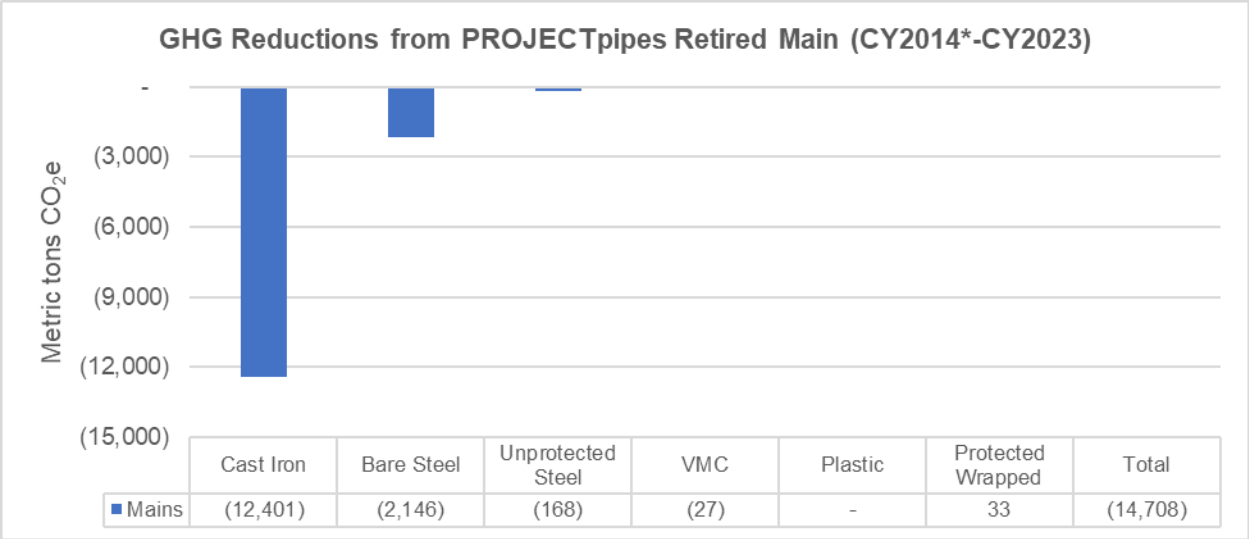


Figure 16: Estimated Emissions Reductions from Services Replaced Under PROJECT*pipes* by Material (CY2014 - CY2023)

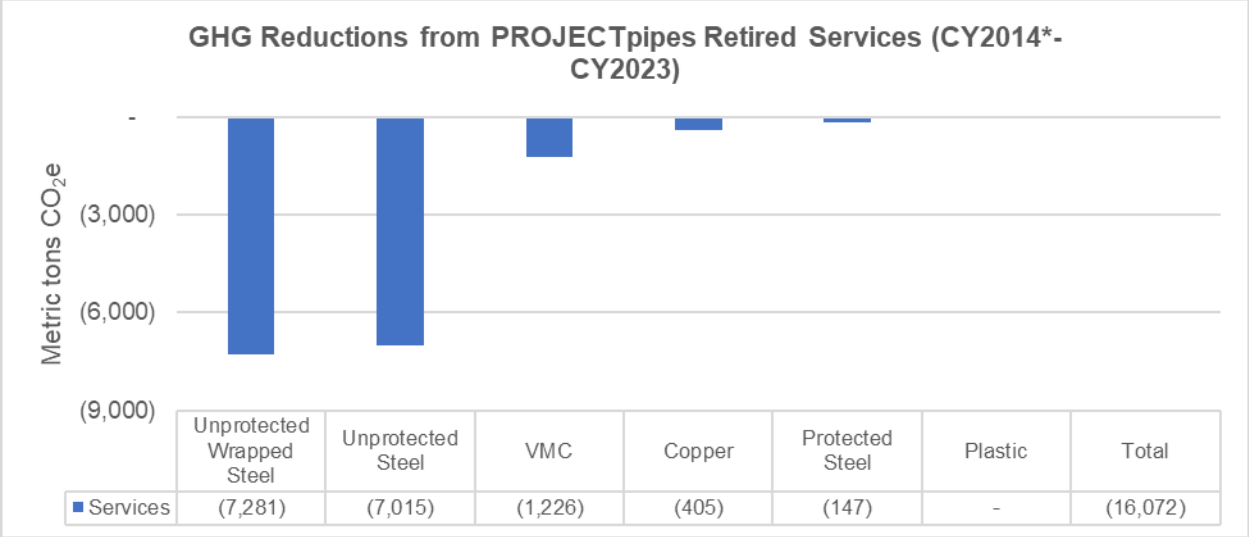


Table 6: Estimated Total and Average Annual GHG Reductions in PROJECT*pipes*

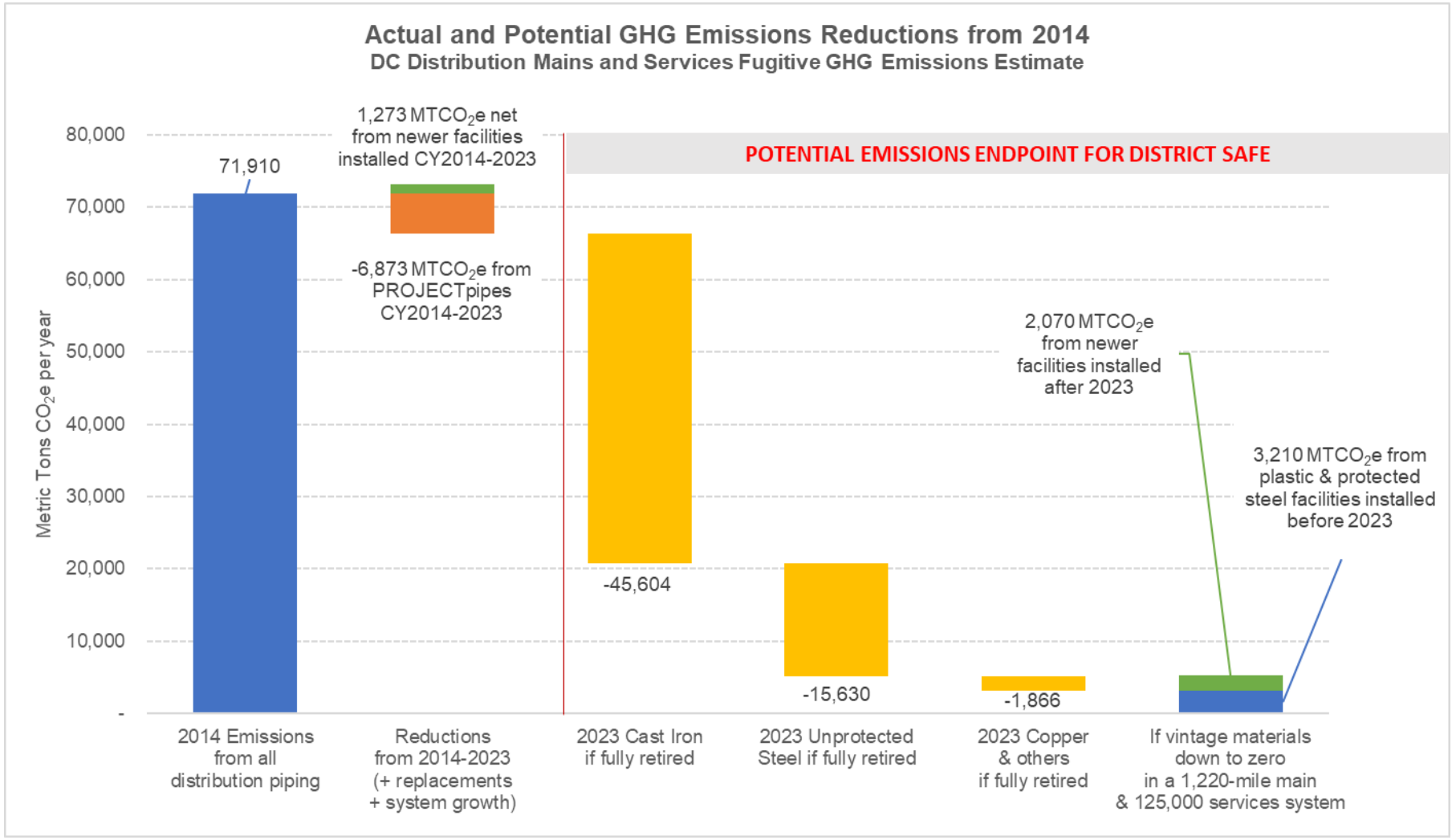
(Annual MTCO2e reduction)	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	**Total**	**Average**
Mains Sub-Total	208	249	195	237	257	324	217	612	422	459	3,180	318
Services Sub-Total	120	464	239	240	207	372	214	336	634	866	3,693	369
Total	328	713	435	477	464	696	431	948	1056	1325	**6,873**	**687**

b. Additional Potential Benefits from Accelerated Pipeline Replacement

Through further future pipeline replacement activities, the Company's GHG emissions in the District, have the potential to reduce the annual direct Scope 1 fugitive emissions from distribution mains and services from the current approximately 66,300[46] to approximately 5,300 metric tons of carbon dioxide equivalent, as shown in Figure 17. This represents an approximately 92% reduction in fugitive emissions attributed to distribution mains and services. This reduction is possible when the leak-prone vintage facilities are replaced by newer materials or retired.[47] If the Company continues the current 2023 pace of accelerated investments in pipe replacements for the next 30 years (even though this does not take the vintage materials to zero in that timeframe), the replacement activity would result in a total compounded cumulative emissions reduction of approximately 830,000 metric tons of carbon dioxide equivalent including actual CY2014-CY2023 GHG emission reductions.[48]

[46] Formal Case No. 1162 [Washington Gas – Annual GHG Emissions Report]. Filed June 27, 2024. Fugitive Emissions (Gas Supply) attributed to Distribution Mains (52,038 metric tons CO2e) and Distribution Services (14,329 metric tons CO2e). Page 3.
[47] This estimate assumes a future distribution mains inventory of 900 miles of plastic main, about 320 miles of protected steel main, and about 125,000 plastic distribution services using the appropriate carbon dioxide equivalent emission factors for distribution materials specified in Formal Case No. FC1162 WGL Annual GHG Emissions Report, covering CY2023 Commission Data Request No. 9 to WGL. June 28, 2024 (Emission factors as translated: 1,473 kgCO2e/yr/mile and 4,757 kgCO2e/yr/mile for protected steel and plastic main, respectively and 4 kgCO2e/yr/service for plastic service).
[48] This estimate includes actual GHG reductions from CY 2014 to CY 2023 and assumes an almost constant linear reduction curve of about 1,300 metric tons of CO2e reduced annually as achieved in CY2023 for another 30 years by installing newer materials or retiring higher risk materials.

Figure 17: Estimate of Actual and Potential GHG Emissions Reductions from the Replacement of District Distribution Main and Services



The Company notes that these emissions reduction estimates are currently limited to its direct operational emissions. The estimate does not include the much higher potential reductions that could be achieved through any transition to lower carbon fuels, which could be accomplished with a system comprised of modern pipe materials. Natural gas consumption in the District in the Buildings and Energy sector continues to account for much lower total GHG emissions and lower combustion-related emissions per energy unit profile compared to electricity's associated emissions in the same sector.[49] With further accelerated modernizations as proposed in District SAFE, newer, less risky, or less leak-prone pipe materials would be able to safely facilitate the transportation of certain renewable and lower carbon intensity fuel types within the District. These include combined heat and power, methane from landfill, methane from wastewater treatment, and waste heat/wastewater.[50]

Subject to the Commission's approval of future technology feasibility studies,[51] customer acceptance of emerging technologies, and any cost recovery approvals from the Commission, these newer pipe materials could also enable a District-wide affordable, equitable, and resilient transition to: alternative energy carrier fuels such as hydrogen;

[50] District's Renewable Energy Portfolio Standard (RPS). https://dcpsc.org/Utility-Information/Electric/RPS.aspx.
[50] District's Renewable Energy Portfolio Standard (RPS). https://dcpsc.org/Utility-Information/Electric/RPS.aspx.
[51] While there is no pending hydrogen feasibility study proposed in the recently filed FC 1167 - WGL New Programs - Proposal to Implement the District of Columbia's Climate Goals [08.05.24], RNG and hydrogen fuel would be important for DC to consider pilots/programs for medium and heavy-duty transportation that might struggle to electrify economically and still meet DC's Clean Energy Omnibus Act 2018. The Act mandates that 100% of public buses, public fleets, private fleets of more than 50 vehicles, and taxis and limousines are to be zero-emission by 2045 (and 50% zero-emissions by 2030). https://doee.dc.gov/service/clean-energy-dc-omnibus-amendment-act

and/or enable gradual transitions to networked geothermal in areas further assessed as simultaneously prime for main and service retirement and geothermal deployment.

Inherently, District SAFE projects will help accelerate the modernization of the District's underground pipeline infrastructure by creating a strategically targeted pipe replacement plan that focuses on the highest-risk segments of aging, leak-prone mains and services. This infrastructure will lower emissions associated with energy use in the District and will likely play a role in serving customers as the District transitions toward its clean energy future. District SAFE supports the District's goal to move its emissions toward its carbon neutral objective.

c. District SAFE Will Accommodate Customer Choice

The Company is proposing a pilot program as part of District SAFE that will provide customers with advance notice of replacement work, to address the Commission's concern that customers may wish to leave the gas system. Specifically, the Company proposes a process to identify customers served from vintage facilities that no longer wish to receive gas service, so that the Company can avoid installing facilities that are not needed to serve customers.

As part of its pilot program, of the service lines that it plans to replace, via Company initiated projects in the District SAFE program, in years one and two of the program (*i.e.*, March 2025 through December 2026) within 60 days of the entry of an Order in District SAFE. Beginning with service lines planned to be replaced in year two, the Company will provide notification to the impacted customers via certified mail within 90 days of the date

of the Commission's order that their location has been identified for a service line replacement in 2026. The cost of the certified mailing will be recovered through the rider.

Customers scheduled to have service lines replaced via Company initiated projects in the District SAFE program in 2026 will have until December 1, 2025, to opt out. In order to opt out, the customer must: (1) affirm that they are the owner of the property; (2) indicate that they have converted their home to an alternative fuel source; and (3) terminate their Washington Gas service. When opt-out/termination occurs, services will be abandoned. Additionally, where present on the program list for a given year, premises with vintage service lines having no usage and no customer on record for 24 consecutive months or more will be abandoned. To the extent this meaningfully reduces the amount of work to be accomplished in a given Plan year, the Company will supplement its project list with additional risk-prioritized work.

On a going forward basis, service line replacement locations, on Company initiated projects in the District SAFE program, will be identified 12 months in advance (i.e., service line replacements for 2027 will be locked in as of December 2025). Customers will be notified via certified mail and will have approximately 11 months to convert and complete the opt-out process. Any customers that do not specifically opt-out of gas service and have not terminated their account will have their service line scheduled for replacement and replaced during the identified year.

This Pilot Program is being proposed to provide the Commission and all parties with better data regarding customer behavior, and to address the Commission's concerns regarding potential customer migration and stranded assets. The Company does note that in order to give customers advance notice, Washington Gas will select projects farther

out from the construction start time than it would otherwise do. This will make the project list staler and less responsive to newly incorporated data or field observations. While the Company does not believe that this reflects the best practice for ensuring that it is removing the most risk-prioritized pipe in the project year, the proposed pilot program seeks to address the Commission's specific objective of balancing safety with its concern regarding stranded assets.

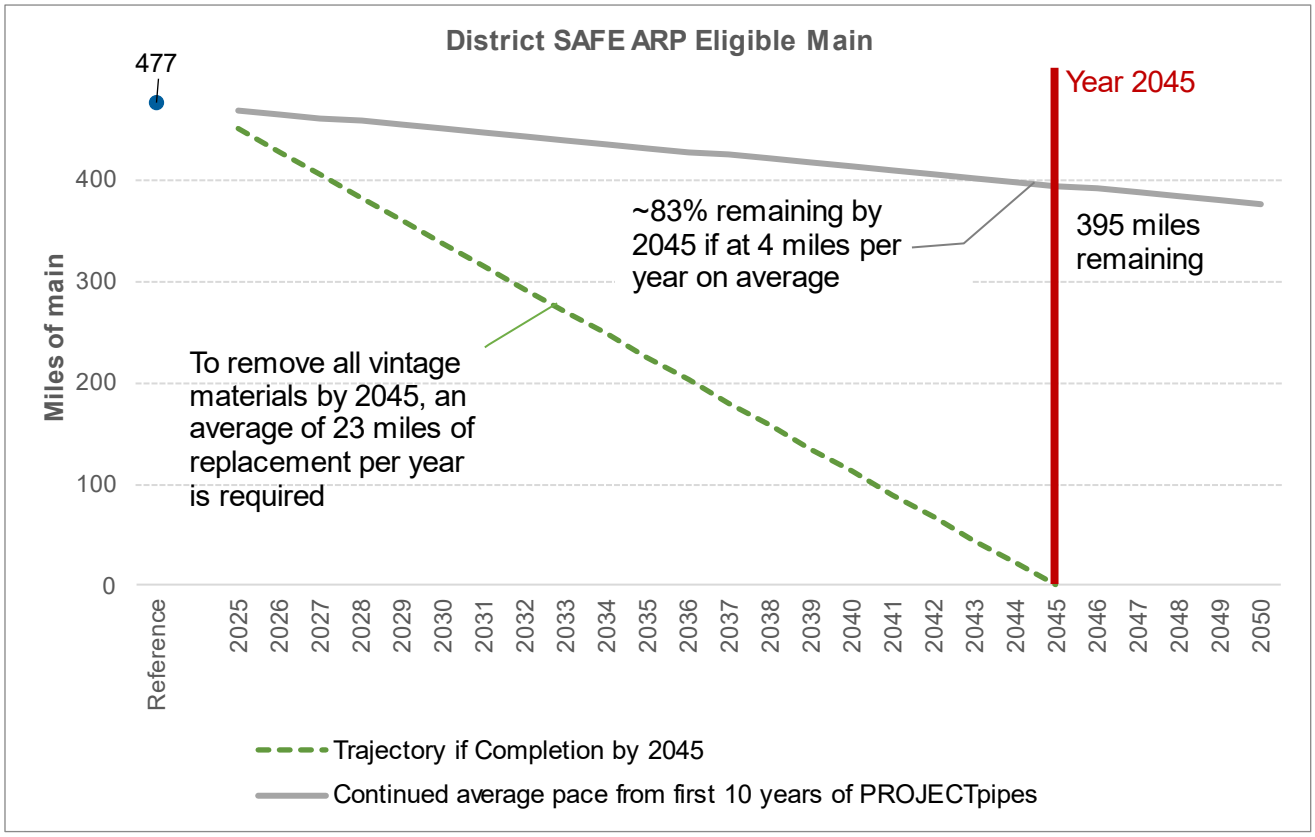
VIII. The Future of District SAFE

As proposed in this Plan, District SAFE will reduce the miles of at risk main and services in the District by retiring approximately 12 miles of main and 3,600 services from CY 2025 to CY 2027. This reflects only approximately 3% of the miles of main and about 15% of services that need to be retired in order to address the concerns identified by PHMSA. Under the Company's original PROJECT*pipes* plan, Washington Gas would not have completed the primary main replacement work targeting vintage materials until 2054.[52]

District SAFE will need to further accelerate in future years in order to address the safety concerns present on the system. In order to retire all cast iron, bare steel main and services, vintage mechanical coupled main and services, unprotected wrapped steel main and services, and copper services on a truly accelerated timeline – with a completion date on or before 2045 – the Company would need to retire or replace approximately 25 miles of main per year and about 1,500 services per year, as illustrated in Figure 18 and Figure 19 below for main and services, respectively.

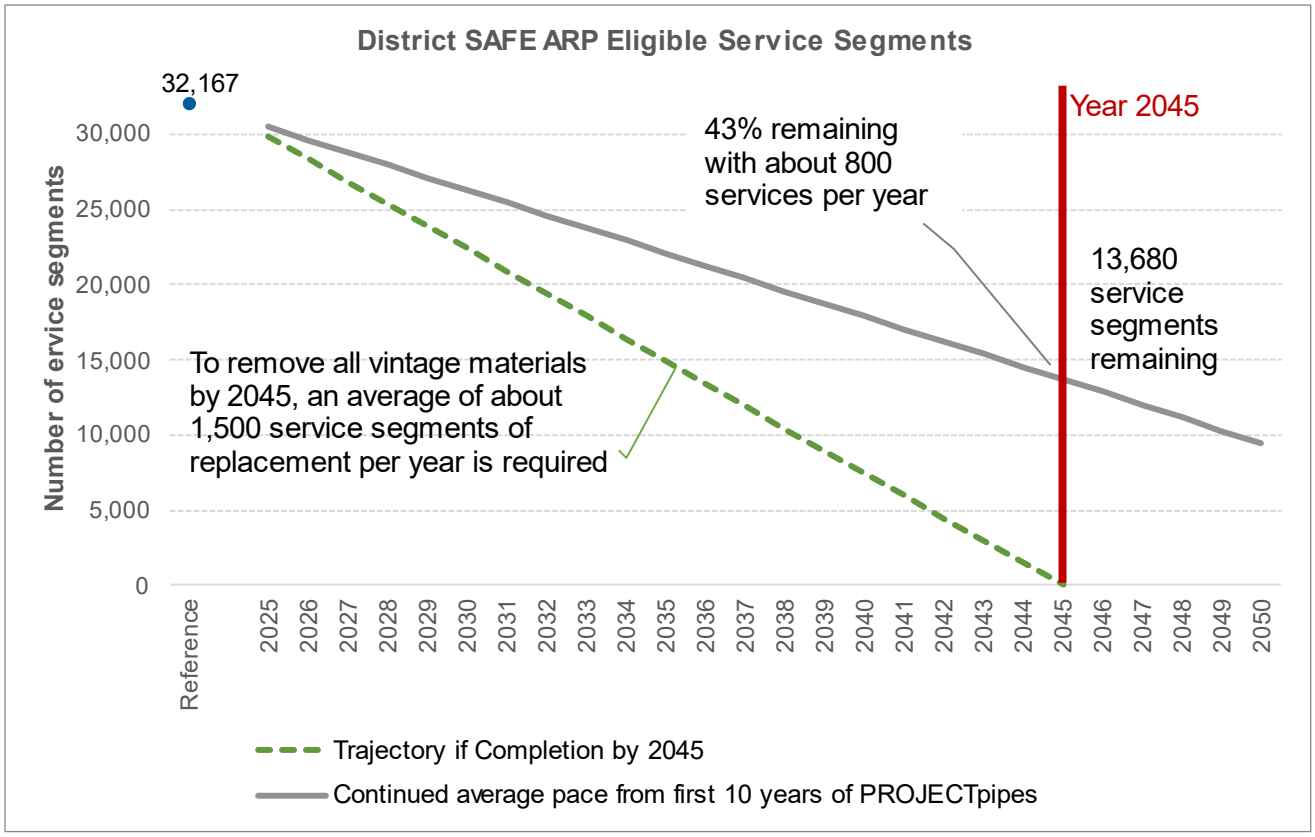
[52] The 2054 target did not include VMC plastic in its scope of work.

Figure 18: Forecast of Reductions in the District Distribution High-Risk Main through District SAFE Work



Note: Reference is 2023, graphs show high-risk main miles remaining at the end of each calendar year.

Figure 19: Forecast of Reductions in Distribution High-Risk Service Segments through District SAFE Work



Note: Reference is 2023, graphs show high-risk service segments remaining at the end of each calendar year.

As shown in Figure 18 and Figure 19 above, the Company has modeled two scenarios for both mains and services. One scenario shows the pace of activities needed to address all vintage facilities by 2045. The other scenario shows the replacements that will be accomplished if the Company is only approved to continue at an average pace of replacements achieved in PROJECT*pipes*. In order for the District to completely eliminate vintage materials on the system, in support of the District's carbon-neutral date of 2045, Washington Gas would need to replace services at a rate of 1,500 services per year and replace approximately 23 miles of high-risk main per year, starting in 2028. Commission support for the long term improvement of the gas system can lead to the potential

emissions endpoint for District SAFE previously illustrated in Figure 17. In general, the Commission should allow greater acceleration to ensure the safety of customers, particularly where the work is consistent with the goal of greater decarbonization.

Improvements in the District's policies that would reduce or remove the significant cost drivers (described in Section V(c)-(f)), adoption of the proposed Customer Choice Pilot Program (described in Section VII(c)), and the approval by the Commission of incremental dollars for accelerated replacement activity, beyond those presented in Table 4 (Section VI(a)) could help further accelerate strategic facility enhancements to the District's energy system, including a greater number of retirements and replacements of aging high-risk mains and services.

IX. CONCLUSION

The replacement activity reflected in District SAFE is critical to maintaining a safe and reliable system in the District. As described herein, it also supports the District's climate goals by lowering the emissions associated with energy consumption in the District. The Company asks for expedited approval of this Plan so that it can continue its progress and help the Commission rise to meet PHMSA's recommendations, communicated to the Commission in a letter dated May 13, 2024, to "remove and/or replace unprotected steel, cast iron, and other high-risk pipes within those gas distributions operators under the DCPSC authority" including monitoring and accelerating targeted replacements "as much as possible by the DCPSC until all high-risk pipe has been removed."[53]

[53] Letter from Pipeline Hazardous Materials Safety Administration to Public Service Commission of the District of Columbia, 2 (May 13, 2024) (emphasis added).

FC 1179 Agenda

No.	Date	Topics
1	August 1 (1 hour)	Baseline and Agenda
2	August 13 (2 hours)	Funding Considerations (a) What are the expected cost efficiencies from WGL's proposed plan after incorporating the following[1]: - Accountability for Cost Estimates. *Attachment to Order No. 22003 at ¶8*. - Differentiating "normal" and "accelerated" replacements. *Order No. 22003 at ¶51(n)*. (b) - How is Project PIPES currently funded and what are the impacts of inadequate funding? - What other options has Washington Gas explored for funding? - What federal and District funding is currently available? - What are other peer organizations spending on accelerated replacement activity? - What cost recovery mechanisms are available to limit stranded costs and encourage alignment with the District's goals? - How do current funding opportunities/long-term costs for safety work compare to electric efforts and costs?
3[2]	August 22 (2 hours)	State of the System Presentation and Risk Mitigation - Project EVA, Resource Loaded Integrated Schedule ("WGL is to apply EVA techniques to a subset of accelerated mains replacement projects in order to establish the schedule and budget performances.") *Attachment to Order No. 22003 at ¶10*. - Urban Challenges Benchmark/Best Practice Comparison (how many of the areas listed in the Order were included in the benchmark/comparison?) *Attachment to Order No. 22003 at ¶18*. o New Technology Investigation: this year's two new techniques, processes, and excavation methods. *Attachment to Order No. 22003 at ¶21*. - Projects based on only pipe age and material type. *Order No. 22003 at ¶49*. - Emissions/Leak Mapping. *Order No. 22003 at ¶¶49, 51(i)-(k), Attachment to Order No. 22003 at ¶¶4-5*. o What is the selected emissions/leak mapping methodology and software that "targets the

[1] Topic (a) was discussed in Meeting 4a
[2] In-person meeting

		highest-risk segments of the aging, leak-prone mains, and services"? o Expected emissions reductions from ALD incorporation into proposed project selection. o JANA's advantages. - What new pipe replacement methodologies adhere to Order No. 22241 at ¶8, and Order No. 22003 at ¶46-49? - Will WGL resolve inconsistent reports (different reported numbers) to the Metropolitan Washington Council of Governments, the PSC, and EPA for therms delivered, GHG emissions, and fugitive emissions? *Attachment to Order No. 22003 at ¶11.*
4[3]	August 29 (4 hours)	<u>Short-Term: Immediate Cost-Effective Emissions and Risk Reduction Strategies</u> - What options are immediately available to lower customer emissions? - Non-Pipes Alternatives: industry best practices and WGL's proposition. *Order No. 22003 at ¶51(p)*. - How can we make safety work more cost effective in the District? - What are the cost drivers and what policies/parties could be engaged to help lower costs? - How should reliability and resilience be considered?
5	September 12 (2 hours)	<u>Long-Term: The Future of Energy in the District</u> - What options are being considered for System Reliability Studies and modeling for proposed pipe decommissioning in response to increasing electrification? *Attachment to Order No. 22003 at ¶7*. - Customer programs currently available in the District - Visions for Decarbonization: what do participants think electrification looks like in practice? - How do we consider customer preferences and behavior? - What information needs to be collected to facilitate the District's goals? - What policies would facilitate the District's goals? - What policy questions need to be addressed by the Commission? - What policy issues are outside of the Commission's jurisdiction? - What policies should Washington Gas consider adopting?
6	September 23 (1 hour)	Presentation and Discussion on DC SAFE

[3] Meeting split into 4a and 4b. 4a covered District Policies and impacts on cost effectiveness and included a representative from DDOT and PEPCO. 4b covered emissions reductions strategies.

Service List for FC 1179 Meetings (August 1 – September 23, 2024)

Party	Individuals	Email
OPC	Laurence Daniels	ldaniels@opc-dc.gov
	Ade Adeniyi	AAdeniyi@opc-dc.gov
	Ankush Nayar	anayar@opc-dc.gov
	Jason Cumberbatch	jcumberbatch@opc-dc.gov
DOEE	Lancelot Loncke	Lancelot.Loncke@dc.gov
	Peter Damrosch	peter.damrosch@dc.gov
	Nick Burger	nick.burger@dc.gov
	Thomas Bartholomew	Thomas.bartholomew@dc.gov
	Katya Botwinick	Katya.botwinick@dc.gov
	Hussain Karim	Hussain.karim@dc.gov
OAG	Brian Caldwell	Brian.caldwell@dc.gov
	Wesley Rosenfeld	Wesley.rosenfeld1@dc.gov
AOBA	Frann Francis	ffrancis@aoba-metro.org
	Bruce Oliver	br.oliver@verizon.net
	Tim Oliver	tim.b.oliver@gmail.com
	Uatausha Taylor	utaylor@aoba-metro.org
	Kevin Carey	kcarey@aoba-metro.org
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	May Va Lor	mlor@liuna.org
	Erin Bryant	ebryant@liuna.org
Sierra Club	Timothy Oberleiton	toberleiton@earthjustice.org
	Susan Stevens Miller	smiller@earthjustice.org
	Erin Mettler	erin@rewiringamerica.org
	Amanda Sachs	amanda@rewiringamerica.org
	James Crowley	jcrowley@rwalkerconsultancy.com
EDF	Erin Murphy	emurphy@edf.org
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	John Macgregor	Beamup2@gmail.com
CCAN	Naomi Cohen-Shields	naomi@chesapeakeclimate.org
	Mustafa Abdullah	mustafa@chesapeakeclimate.org
Customers	Anne Debuys	anne.debuys@gmail.com
	Devan Sammant	ds4114@columbia.edu
DDOT	Williams Courtney	Courtney.Williams@dc.gov
PEPCO	Kimberly Curry	kimberly.curry@exeloncorp.com
	Poetri S Deal	pdeal@pepco.com
	Jamouneau Dennis	djamouneau@pepcoholdings.com

Issue	Forum	Commentary
Stakeholder Engagement and Public Outreach	FC1167	Cases involving coordination of gas and electric activities supporting climate objectives should be addressed in the climate policy docket, particularly where no infrastructure impacts exist. Notwithstanding the above, the Company's proposal in this proceeding incorporates advance notification of facilities that have been designated for replacement, thereby allowing the District and customers the opportunity to electrify where feasible.
Non-Pipes Alternatives	FC1167	The Company has a proposal currently on file to explore this topic. DOEE did not support a procedural schedule to advance the discussion on the policy issues around non-fossil infrastructure.
Data Sharing	FC1167	Cases involving coordination of gas and electric activities supporting climate objectives should be addressed in the climate policy docket, particularly those focused on heavy cross-utility activity (i.e., PEPCO is not in FC1179). Notwithstanding the above, the Company's proposal in this proceeding incorporates advance notification of facilities that have been designated for replacement, thereby allowing the District and customers the opportunity to electrify where feasible.
Mapping and Tracking Electrification	Base Rate Case or FC1167	To the extent DOEE is seeking information on customer usage patterns, that information is made available in base rate proceedings. However, proposals on data to support electrification as a climate objective should be addressed in the climate policy docket.
Scenario Modeling and Forecasting	Base Rate Case, FC874 or FC1167	To the extent DOEE is seeking information on customer usage patterns, that information is made available in base rate proceedings. If DOEE is seeking information regarding system use under various scenarios, then that is more appropriately addressed in the gas

		procurement and supply docket. However, proposals on data to support electrification as a climate objective should be addressed in the climate policy docket.
Planned Pipe Repairs/Replacements	FC1179	This is already being addressed.
Leak Mapping	FC1178 or FC1179	To the extent DOEE is interested in alternative leak identification approaches, this belongs in FC1178. To the extent this is about the incorporation of leak data into the risk model, that is already addressed in FC1179.
Address Inconsistent Reporting	FC874, FC1178 or FC1167	These issues around reporting appear to be focused on gas supply and associated emissions reporting. To the extent they are about supply activities, they belong in FC874. If they are regarding system leak issues, then that would be addressed under the broad policy umbrella of FC1178. If it is rather about comprehensive reporting, the Company has an existing proposal in FC1167 addressing gas supply reporting.
System Reliability	FC1179 or FC1167	The Company agrees that this is something that system safety and reliability is already being explored in FC1179. However, this proceeding is focused on replacement of used and useful assets that present the most risk on the Company's system. To the extent the issues raised are focused on electrification dynamics, particularly in conjunction with PEPCO's system, they should be addressed in FC1167.
Customer Education/Awareness of Options	FC1160	DOEE's issues and proposals appear related to customer appliances and programs oriented towards end use customer issues. These would be appropriately addressed in the energy efficiency docket. However, the Company's proposal in this proceeding incorporates advance notification of facilities that have been designated for replacement, thereby allowing the

		District and customers the opportunity to electrify where feasible.
Performance Incentives for Electrification	Base Rate Case or FC1160	Issues impacting rates and should be addressed in a base rate proceeding, however to the extent performance incentives were to be paired with specific program performance then that may also be appropriate for the energy efficiency docket. This cannot be accomplished in FC1179.
Value Capture	Base Rate Case or FC1167	This issue as identified by DOEE defies basic utility ratemaking principles, but to the extent the Commission believes it should be addressed, it must be addressed in a base rate proceeding. The Company also rejects the baseline premise that natural gas customers should fund electrification.
Demonstration Projects	FC1167	This is the kind of proposal that FC1167 was designed to accommodate. The Company has filed a number of proposals to open the discussion of pilot programs and demonstration projects at that docket.
Stranded Assets	FC1179	This is already being addressed.
Equity Analysis	FC1179; Base Rate Case or FC1167	To the extent DOEE seeks to evaluate whether the risk prioritization process is equitable, that is appropriately within FC1179. Issues regarding cost allocation or cost recovery or coordination of targeted electrification are issues for a base rate case, or FC1167 should they require gas/electric coordination.
Protections for Low-Income Ratepayers	Base Rate Case	The relationship between low income customer programs, usage issues, and rate relief are clearly within the scope of a base rate proceeding
Electrification Outreach and Engagement	Base Rate Case or FC1167	This issue appears to be focused on compelling a gas company market on behalf of the District government's electrification initiatives. This would require an expansion of the Company's marketing budget, and therefore must be done in either a base rate case or the climate docket.

ATTESTATION

I, JESSICA ROGERS, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

Jessica Rogers
Jessica Rogers (Sep 26, 2024 08:22 EDT)

JESSICA ROGERS

26/09/2024

DATE

WITNESS QUARTERMAN
EXHIBIT WG (B)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF	
THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

DIRECT TESTIMONY OF CYNTHIA L. QUARTERMAN
Exhibit WG (B)
(Page 1 of 1)

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Exhibits

EXHIBIT WG (B)

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF CYNTHIA L. QUARTERMAN

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Cynthia L. Quarterman and I am an independent consultant to Washington Gas Light Company ("Washington Gas" or "Company"). My mailing address is 2802 McGill Terrace, NW, Washington, DC 20008.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I received a Bachelor of Science degree in Industrial Engineering from Northwestern University and a Juris Doctorate from the Columbia University School of Law. I am filing this affidavit as an independent consultant to the Company. I have more than 35 years of experience in the energy regulatory area. I served as the Administrator at the US Department of Transportation's ("DOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA"). PHMSA is responsible for oversight of the safe transportation of oil, gas and other hazardous materials by all modes of transportation, including pipelines. From May 2019 until it was disbanded last October, I served as a member and then Chair of the independent Quality Review Board for NiSource Inc. The Quality Review Board was responsible for overseeing the adoption and implementation of NiSource's Safety Management System for its natural gas pipeline systems (and, to a certain extent, its electric utility) following its 2018

pipeline incident in Merrimack Valley, Massachusetts. In addition, since leaving PHMSA, I have been a Distinguished Fellow at the Atlantic Council's Global Energy Center. In that position, I consider topics and policies related to current energy issues throughout the world. I am appearing here in my private capacity as a former energy regulator with expertise in the safety of natural gas pipelines. I am also a resident of the District of Columbia. Attached as an exhibit is a copy of my Curriculum Vitae. See Exhibit WG (B)-1.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY TO THE PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA ("COMMISSION") OR ANY OTHER PUBLIC UTILITY COMMISSION?

A. No, I have not provided testimony to a public utility commission, however, I have appeared before federal commissions as an attorney and have testified in numerous Congressional hearings.

Q. WHAT MATERIALS DID YOU REVIEW IN PREPARING YOUR TESTIMONY?

A. In preparation for my testimony, I have reviewed the following orders and filings related to Washington Gas's accelerated replacement program for its pipeline system:

- Order No. 17431, Formal Case No. 1115 (Mar. 31, 2014);
- Order No. 17602, Formal Case No. 1115 (Aug. 21, 2014);
- Sensitivity Analysis, Formal Case No. 1115 (Oct. 20, 2014);
- Order No. 17789, Formal Case No. 1115 (Jan. 29, 2015);
- Final Report Management Audit of PROJECTpipes by The Liberty Consulting Group (Apr. 19, 2019);
- PROJECTpipes Cost-Benefit Analysis by Jacobs Consultancy, Formal Case Nos. 1142 & 1154 (Jul. 30, 2019);

- Order No. 20671, Formal Case No. 1154 (Dec. 11, 2020);
- Technical Conference Report on Washington Gas's Pipe Replacement Activities, Formal Case No. 1154 (Jul. 26, 2021);
- Technical Conference Report on Washington Gas's PROJECTpipes Program Implementation Plan and Liberty Audit Recommendations, Formal Case No. 1154 (Nov. 22, 2021);
- Washington Gas's Application for Approval of PROJECTpipes 3 Plan, Formal Case No. 1175 (Dec. 22, 2022);
- Rebuttal Testimony of Tracy Townsend, Formal Case No. 1169 (Jan.3, 2023);
- Comments of the District Department of Energy and Environment on Washington Gas Light Company's PROJECTpipes 3 Plan Application, Formal Gas No. 1175 (May 2, 2023);
- Comments of the District Department of Transportation on Washington Gas Light Company's PROJECTpipes 3 Plan Application, Formal Case No. 1175 (May 2, 2023);
- Comments of the Apartment and Office Building Association of Metropolitan Washington, Formal Case No. 1175 (Jun. 16, 2023);
- DC Climate Action's Initial Comments, Formal Case No. 1175 (Jun. 16, 2023);
- Office of the People's Counsel for the District of Columbia's Comments on Washington Gas Light's PROJECTpipes 3 Plan, Formal Case No. 1175 (Jun. 16, 2023);
- Sierra Club's Initial Comments, Formal Case No.1175 (Jun. 16, 2023);

- Rejoinder Testimony of Tracy Townsend, Formal Case 1169 (Jun. 23, 2023);
- Government of the District of Columbia, Advisory Neighborhood Commission 3B, Glover Park and Cathedral Heights, Resolution in Opposition to Washington Gas PROJECTpipes (Nov. 9, 2023);
- Independent Management Audit of PROJECTpipes2 by Continuum (Dec. 12, 2023);
- Washington Gas — Response to Notice of Commissioner Beverly, Formal Case No. 1154 (Jan. 17, 2024);
- Order No. 22003, Formal Case No. 1154, 1175 & 1179 (Jun. 12, 2024);
- Washington Gas's Application for Reconsideration of Order No. 22003, Formal Case No. 1175 (Jul. 12, 2024);
- Order No. 22294, Formal Case No. 1154 (Sept. 12, 2024); and
- Washington Gas's District SAFE PLAN.

II. PURPOSE OF TESTIMONY

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of Washington Gas Light Company ("Washington Gas" or the "Company").

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes, I sponsor Exhibit WG (B)-1 and WG (B)-2.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony, with accompanying exhibits, is to: (1) discuss PHMSA's Call-To-Action and the history surrounding that critical safety initiative; (2) identify the materials that should be subject to accelerated

replacement and the factors that necessitate expedited action; and (3) support the need for Washington Gas to continue to address vintage materials on an accelerated basis through its proposed District Strategic Accelerated Facilities Enhancement Plan (i.e., the Revised PROJECTpipes 3 Program) ("SAFE Plan") and to recommend that the Commission, **at a bare minimum**, approve Washington Gas's District SAFE Plan as sound public policy that is imperative to public safety in the District of Columbia.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. Specifically, my conclusion is three-fold: First, it is prudent to approve the District SAFE Plan and indeed it could be catastrophic if the plan was not approved and a pipeline-related incident occurred because of failure to adopt the plan. Second, such action is consistent with longstanding policy objectives of this Commission and federal regulators that have delegated their authority to the District. Third, such action may be required by federal rules and policy; failure to allow such action may elicit federal scrutiny.

III. THE CALL TO ACTION

Q. PLEASE EXPLAIN YOUR KNOWLEDGE WITH RESPECT TO THE REPLACEMENT OF HIGH-RISK PIPE.

A. The first and foremost mission of PHMSA is ensuring pipeline safety. During my tenure as PHMSA Administrator, I witnessed several low probability, high consequence oil and natural gas pipeline incidents that destroyed communities and caused catastrophic injuries and deaths. One of those natural gas incidents occurred on September 10, 2010, when a longitudinal seam on a

1956 era, non-industry standard steel natural gas transmission pipeline operated by PG&E ruptured and devastated an entire neighborhood in San Bruno, California, injuring 51 people, killing 8 and destroying 38 homes. Then on January 18, 2011, a break on a 1942 vintage 12-inch cast iron distribution main caused an explosion and death of a utility worker in Philadelphia, Pennsylvania. Shortly thereafter, on February 9, 2011, there was a catastrophic incident on a 1928 vintage 12-inch cast iron distribution main operated by UGI in Allentown, Pennsylvania, injuring 3 people, killing 5 and destroying 8 homes. Although the authority to oversee these pipelines had been delegated to state oversight agencies, so many harrowing pipeline incidents within a few months span caused the Department of Transportation to lead a nationwide Call to Action to replace, repair and/or rehabilitate the highest risk pipelines in April 2011.[1] The then-Secretary of Transportation, Ray LaHood, and I visited the communities in San Bruno and Allentown, met with those affected and saw first-hand the destruction that can occur from a natural gas incident.

As a part of that Call to Action, PHMSA chaired multiple meetings to listen to stakeholder concerns and encouraged expedited removal of the highest risk pipe. Among others, specifically referenced was cast and wrought iron, bare steel, copper, and certain kinds of welded pipe.[2] We also made speeches before, and entreaties to, the Federal Energy Regulatory Commission ("FERC"), the National

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[1] *See* DOT News Release, "US Transportation Secretary Ray LaHood Announces Pipeline Safety Action Plan," https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/dot4111.pdf(hereinafter "DOT Call to Action News Release").

[2] *See* U.S. Department of Transportation Call to Action to Improve the Safety of the Nation's Energy Pipeline System, *https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/Action%20Plan%20Executive%20Version%201%20NOV%2011.pdf*.

Association of Regulatory Utility Commissioners ("NARUC") and individual state utility commissions to ask for their support in identifying high-risk pipelines and accelerating pipeline replacement projects through appropriate rate recovery mechanisms. At the time of the Call to Action, PHMSA specifically highlighted as inadequate state programs such as those in Pennsylvania, New York, and Connecticut that did not require cast iron pipeline replacement for 100, 79 and 69 years, respectively.[3]

Q. WHY WAS ACCELERATED RATE RECOVERY A CRITICAL COMPONENT OF THE RECOMMENDATIONS MADE TO NARUC AND OTHER STATE COMMISSIONERS?

A. PHMSA's outreach to NARUC and state commissioners was deemed critical to the success of the initiative, so critical that Transportation Secretary LaHood addressed the NARUC general assembly personally and I addressed the NARUC Gas Committee and met with the FERC Chair and staff. The reason was because the Department recognized that in order to make the Call to Action succeed, it needed the commitment of utility commissions to dedicate themselves to prioritizing safe pipelines for the public. As a former attorney in rate proceedings, I understood that the only way to make pipelines safe was to ensure that pipeline operators had the funding necessary to replace high-risk pipelines as soon as possible. Because of the time delay in recovering costs using traditional ratemaking authority, the Department encouraged alternative expedited funding mechanisms. Fortunately, some states had already recognized the need for accelerated action and there were several approaches for operators

[3] *See* DOT Call to Action News Release at 3-4.

to consider when asking for additional funds to replace aging infrastructure more quickly than previously planned.

In my capacity as Administrator, I sent letters to every state (and the District) with a pipeline safety program asking for the current status of pipelines in their state and their plans to expedite high-risk pipeline removal. The responsive letter from this Commission stated that the District had 428 miles of cast iron main, some of which had been lined and/or the joints internally sealed, and a 7-year program to replace 26 miles of vintage mechanically coupled main and 3,500 vintage mechanically coupled services.[4]

Since that time, much to its credit, this Commission has approved an accelerated replacement program for the Company's vintage pipe and acknowledged repeatedly the need for such a program to replace the District's aging pipeline infrastructure, including going so far as to consider whether the replacement program should be expedited beyond the period proposed by the Company.[5]

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[4] *See* Letter from Commissioner Kane to Adminstrator Quarterman re Replacement Plans for High Risk Pipelines in the District of Columbia (Apr. 4, 2011), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/DC%20PSC%20Chairman%20Kane%20Letter%20to%20Administrator%20Cynthia%20Quarterman%20-%20April%2018%2C%202011%20DOT%20Pipeline%20Safety%20Forum_0.pdf.

[5] *See* Order 17132 at paras. 250 & 254 (May 15, 2013)("[The Commission] shares WGL's view that the District would benefit from a pipeline replacement program that targets the pipe with the highest risk and the highest leak rates" and "replacements, have important public safety implications"); Order 17431 at paras. 59 & 61 (Mar. 31, 2014)("[a]ging pipeline infrastructure that results in an increase in the number of gas leaks is a serious problem in the District."); Order 17602 at para. 133 (Aug. 21, 2014)(Commission requested a shorter 25-year analysis for replacement); Order 17789 at para. 63 (Jan.29, 2015)("accelerating replacement of gas pipelines that are leak prone or of such age to be subject to increased risk of leaks and/or failure is of paramount importance"); Order 20671 at para. 34 & 115 (Dec. 11, 2020)("[t]o ignore the age and leaks of the Company's distribution system in the District would ignore legitimate safety and reliability concerns" and "there is an imminent threat to public safety that requires WGL to continue to replace leak-prone, aging infrastructure"); *see also id.* at para. 22, noting that a cost-benefit analysis to accelerate pipe replacement from 40 to 30 years was considered during the settlement of the Washington Gas-Alta Gas merger.

Q. WHY WAS THE CALL TO ACTION IMPORTANT?

A. The 2011 Call to Action came on the heels of seismic change in the views of safety regulators in light of increasingly undeniable evidence. Specifically, while there had historically been a rule of thumb that many pipeline materials had an approximate life span in the 50 to 60 year time frame, the philosophy had changed to suggest that as long as a pipeline asset was well maintained and subject to good operating conditions, its life might be indefinite. Nonetheless, incident data pointed to serious concerns about certain pipeline materials that had been installed during earlier eras of pipeline construction. The Call to Action arose from an assessment of the accumulating evidence. Distribution lines were especially targeted because of their proximity to the public. The closer a pipeline is to a residence, business, or gathering place, the more likely an incident is to cause injury or death. In 2011, when the Call to Action was issued, it was apparent that many natural gas distribution pipelines were still relying on pipeline assets that were well beyond their initially forecasted life span.

These data points have only increased since. Although cast iron distribution mains only account for 1% of all distribution mains, they are responsible for 9% of all main-related incidents.[6] Cast and wrought iron main incidents are also twice as likely to cause fatalities and injuries (38% vs 19% on other mains).[7] Moreover, cast and wrought iron mains account for disproportionate numbers of fatalities and injuries on gas distribution mains (34%

[6] *See* PHMSA Cast and Wrought Iron Inventory, https://www.PHMSA.dot.gov/data-and-statistics/pipeline-replacement/cast-and-wrought-iron-inventory., (hereinafter "PHMSA Cast Iron Inventory").
[7] *Id.*

vs 16% on other mains).[8]

Q. HOW DID NATURAL GAS INFRASTRUCTURE DEVELOP OVER TIME?

A. In the US, pipelines were first installed in the 19th Century to transport manufactured gas to fuel gas streetlights in Baltimore, Maryland. Washington Gas Light followed in 1848, introducing gas pipelines to serve the Capitol in DC. Eventually, natural gas was produced and used for heating, and pipelines proliferated in the early 1900s. Prior to the 1940s, those initial pipelines were made of cast or wrought iron and, later, bare steel pipe. At the time of the Call to Action, in 2011, more than 50% of the nation's active pipelines were constructed before the 1970's in response to the post-World War II building boom. The first pipeline safety standards were not adopted until 1968, meaning any pipelines constructed before then were not subject to any standardized safety requirements. Not surprisingly, the earliest heavily populated cities and states are home to some of the oldest and highest number of pipeline miles made of high-risk material. An early adopter, the District of Columbia is one of those places, employing the largest percentage (32% cast iron) of the highest-risk distribution main pipeline materials in the nation.

Q. WHY WAS CAST IRON ESPECIALLY TARGETED IN THE CALL TO ACTION?

A. The Call to Action targeted the highest risk pipelines for repair, replacement or rehabilitation, but there were certain pipeline materials that were deemed inherently unsafe based on past experience and data. Included among that designation was bare steel pipe, cast and wrought iron pipe and certain early vintage plastic pipes. Cast iron pipe has been of particular concern. As a pipeline

[8] *Id.*

material, cast iron presents special challenges. It is an alloy of iron and carbon, which may not appear to be damaged when it corrodes, but leaves "a brittle sponge-like structure of graphite flakes."[9] "A completely graphitized buried cast iron pipe may hold gas under pressure but will fracture under a minor impact, such as being hit by a workman's shovel."[10] Such graphitization "allows far more dramatic failure modes such as rapid crack propagation, and circumferential breaks. Such failures are potentially more severe than more ductile failure modes commonly seen in today's pipe materials."[11] To further complicate things, cast iron cannot be welded or cut during repairs. In addition, special measures are required to protect cast iron pipelines that have been disturbed. These measures, including an elaborate series of efforts to protect it from damage from vibration, impact, earth movement, outside forces, and future excavations, must be invoked as well as permanent protection from external loads.[12] These extraordinary requirements are especially relevant here where substantial construction related to DC PLUG is being planned near existing cast iron pipelines.[13]

Dating back to the early 1990's, when another natural gas explosion occurred in Allentown, Pennsylvania involving a 4-inch cast iron main that was damaged from a leaky cast iron water main, cast iron took a front seat among safety concerns. That incident destroyed two row houses, killed one person and

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[9] *See* PHMSA Guidance Manual for Operators of Small Natural Gas Systems, January 2017 at III-5, https://www.PHMSA.dot.gov/sites/phmsa.dot.gov/files/doc/small_natural_gas_operator_guide_%28january_2017%29.pdf.

[10] *Id.*

[11] *See* PHMSA Part 192 Corrosion Enforcement Guidance at 150, https://www.PHMSA.dot.gov/sites/PHMSA.dot.gov/files/docs/corrosion_enforcement_guidance'part192_12_7_2015.pdf.

[12] *See* 49 C.F.R. 192.755.

[13] *See, e.g.,* D.C. Plug, *About*, https://www.dcpluginfo.com (last visisted Sept. 25, 2024).

injured 9 people. As a result, the National Transportation Safety Board ("NTSB") issued recommendations to PHMSA's predecessor agency, the Research and Special Programs Administration ("RSPA"), to:

> Require each gas operator to implement a program, based on factors such as age, pipe diameter, operating pressure, soil corrosiveness, existing graphite damage, leak history, burial depth, and external loading, to **identify and replace in a planned, timely manner cast-iron piping systems that may threaten public safety**.[14]

As a consequence, RSPA issued twin safety alerts echoing the NTSB's recommendations and reminding operators that "[c]urrent pipeline safety regulations require that cast iron pipe on which general graphitization is found to a degree where a fracture might result **must be replaced**."[15] In addition, even if there is no immediate hazard, but the pipe is in unsatisfactory condition, the operator is **required to initiate a program to recondition or phase out the pipe involved**.[16] Finally, it noted, any excavated cast iron pipe must be protected against damage, such as enumerated above.[17]

Those decades old safety alerts remain in effect and are relevant to this day. What they do not address is the practicalities of how to identify and survey effectively long buried cast iron pipe that has not been exposed for another reason. Following the 2011 Philadelphia and second Allentown incidents,

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[14] *See* NTSB Pipeline Accident Brief No. DCA90FP001 (Aug. 6, 1991) (emphasis added)https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/NTSB%20Recommendation%20to%20RSPA%20P91-12.pdf.

[15] *See* RSPA Alert Notice, ALN-92-02 (Jun. 26, 1992), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/RSPA%20Alert%20Notice%2092-02.pdf, *see also* RSPA Alert Notice (Oct.11, 1991)(requiring identification and replacement of cast iron piping systems that may threaten public safety), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/RSPA%20Alert%20Notice%2091-02.pdf; 49 C.F.R. 192.489.

[16] *Id.*

[17] *Id.*

PHMSA issued a further advisory bulletin regarding cast iron distribution pipe.[18] That advisory bulletin urged a comprehensive review of an operator's cast iron pipeline replacement program "to accelerate pipeline repair, rehabilitation, and replacement of aging and high-risk pipe" and to "develop and continually update and follow their plans[,] and **consider establishment of mandated replacement programs**."[19]

More recently, cast iron incidents have continued to occur, causing fatalities and injuries. The causes include rainfall after drought conditions, earth movement, freeze-thaw cycles, water erosion, improper backfill and compaction causing overload conditions, subsidence, and leaks at joints.[20] This performance is consistent with what DOT noted in its report on "The State of the National Pipeline Infrastructure" in 2011:

> One material that continues to be the focus of concern is cast iron…the small diameter cast iron pipes have low beam strength and are particularly susceptible to stresses from underground disturbances, such as ground movement, freeze-thaw cycles, soil erosion, undermining due to water main breaks, or nearby excavation activities. Most cast iron problems have been with small diameter, thin wall pipe. Larger, heavier pipe typically performs well, especially if not subject to graphitization…and when they have limited exposure to excavation damage.[21]

These historic incidents point to the relative fragility of cast iron pipes, the importance of their expedited removal, and the fact that any operations in their vicinity, such as those planned to support DC PLUG, must be handled with

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[18] *See* PHMSA Pipeline Safety: Cast Iron Pipe (Supplementary Advisory Bulletin), 77 Fed. Reg. 57 at 17119 (Mar. 23, 2012), https://www.govinfo.gov/content/pkg/FR-2012-03-23/pdf/2012-7080.pdf.
[19] *Id.* at 17120.
[20] *See* PHMSA Cast Iron Inventory.
[21] *See* HTTPS://www.PHMSA.dot.gov/sites/PHMSA.dot.gov/files/docs/secretarys%20infrastructure%20report_revised%20per%20phc_103111.pdf.

extreme caution and care.

Q. WHAT OTHER MATERIALS WERE TARGETED BY THE CALL TO ACTION?

A. The Call to Action targeted all high-risk materials in the Nation's pipeline system that had been deemed over time to be obsolete or had a history of poor performance. After construction of cast and wrought iron pipe began to be phased out, bare or uncoated steel pipe became the material of choice on distribution pipelines up until around the early 1960s, when plastic pipe became available, and the early 1970s, when regulations required steel pipe to be coated. The absence of any coating on a steel pipe to protect it from corrosion caused by its environment can lead to consequential failures. Washington Gas has real life experience with such failures on bare steel pipe in its system. The Company's unprotected bare steel mains have the highest number of leaks per mile of main (9.6 leaks/mi). Certain early vintage plastic pipe, installed from the 1960s to the early 1980s, have also been known to be vulnerable to brittle-like cracking. In addition to particular pipe materials, certain construction practices, such as dated welding and joining techniques, have been found to lead to leaks. For example, vintage mechanically coupled services in Washington Gas's system have the highest number of leaks per 100 service segments (10.6 leaks/100 service segments). All pipelines using those high-risk materials and techniques were targeted for accelerated removal by PHMSA in the Call to Action.

Q. SINCE THE CALL TO ACTION, WHAT HAVE STATES DONE TO REMOVE CAST IRON AND OTHER HIGH-RISK PIPELINES?

A. At the end of 2011, there were 33,669 miles of cast/wrought iron gas distribution main and 15,408 service pipelines, or approximately 3% of the

national gas distribution system.[22] Since the Call to Action, as of the end of 2023, there remained 15,872 miles of cast/wrought iron main and 6,694 services, or approximately 1% of the gas distribution system. In other words, more than 50% of cast and wrought iron mains and services have been retired since the Call to Action.[23] There are now 24 states and one territory that have completely eliminated cast and wrought iron gas distribution pipelines.[24] The 10 states (representing 80% of all the nation's cast iron mains in 2011) with more miles of cast iron mains than the District have since reduced their cast iron mileage by 33-70%, or by 46% on average, which is close to the national average.[25] By comparison, the District has 92% of its cast or wrought iron mains (and no services) from 2011 remaining.[26] Forty-one states and the District of Columbia had established some sort of state infrastructure replacement funding mechanism as of 2019 and were in a good place to retire aging pipelines.[27]

Similar to cast and wrought iron, at the time of the Call to Action, 63,019

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[22] *See* https://portal.PHMSA.dot.gov/analytics/sawdll?portalpages&portalpath=%2fshared%2fpdm%20public%20website%fci%20miles%2fgd_cast_iron (hereinafter "PHMSA Cast Iron Analytics").
[23] *Id.*
[24] *See* PHMSA Cast Iron Inventory.
[25] *See* PHMSA Cast Iron Analytics.
[26] *Id.*
[27] *See* American Gas Association, "State Infrastructure Replacement Activity" Report, Oct. 21, 2019, https://www.AGA.org/WP-content/uploads/2022/11/agastatereplacementactivity.docx; *see also* National Association of Regulatory Utility Commissioners, "Natural Gas Distribution Infrastructure Replacement and Modernization; A Review of State Programs" report, January 2020, https://pubs.naruc.org/pub/45E90C1E-155D-0A36-31FE-A68E6BF430EE?_gl=1*15x86qv*_ga*NzcwODg5NzI2LjE2ODQ0Mjg0NDI.*_ga_QLH1N3Q1NF*MTY5MjgxNTExOS4yNTguMS4xNjkyODE1Mzg2LjAuMC4w; *see also* examples of local distribution companies' programs to expedite removal of cast iron and unprotected steel pipelines, Department of Energy, Office of Energy Policy and Systems Analysis, "Natural Gas Infrastructure Modernization Programs at Local Distribution Companies: Key Issues and Considerations" January 2017 at 31-2, Table 2, https://www.energy.gov/sites/prod/files/2017/01/f34/natural%20gas%20infrastructure%20modernization%20programs%20at%20local%20distribution%20companies—key%20issues%20and%20considerations.pdf (hereinafter "DOE Modernization Analysis")

miles of bare steel distribution main pipe and 2,859,197 services were in use. As of the end of 2023, there were 35,126 miles of bare steel distribution main and 1,390,774 bare steel services remaining. That amounts to a decrease of 44% in bare steel mains and 51% in services. Compared to other jurisdictions, the District had a relatively small inventory of bare steel pipe with 19.78 (1.6%) miles of mains and 5,384 (4.3%) services as of the end of 2023. That is down from 28 main miles and 7,225 services in 2011, approximately a 29% and 26% decrease of bare steel main miles and services, respectively. So, while progress has been made on removing bare steel from the District's pipelines, that removal is still out of pace with the remainder of the country.

Q. WHAT POLICIES HAVE OTHER STATES ADOPTED THAT HAVE BEEN SUCCESSFUL IN ACCELERATING PIPELINE SAFETY WORK?

A. In its 2017 Natural Gas Infrastructure Modernization Programs at Local Distribution Companies (LDC) Report, the Department of Energy ("DOE") identified 15 state accelerated replacement programs that had been particularly successful at increasing annual pipeline replacement rates. I have included a table showing the current status of these plans as Exhibit WG (B)-2 attached to my testimony. It is important to note that the programs highlighted by DOE almost universally sought to eliminate high risk pipe on a 10- to 25-year schedule.

If one looks at the three states specifically cited by PHMSA as having excessively long cast iron replacement programs, one finds that between 2011 and 2023, Pennsylvania (100 years), New York (80 years), and Connecticut (79 years) managed to retire 41, 47 and 38 percent of their cast iron main, respectively, which, if they continue the pace, puts them on course to all be

complete in less than 32 years in total. These examples point to the very real possibility of doing what seems to be the impossible in terms of removing high risk pipelines on an expedited basis.

For a concrete example of the progress that can be made in a supportive regulatory environment,[28] UGI – the utility whose Allentown event was one of the catalysts for the Call to Action – adopted an accelerated replacement program that was approved by its state utility commission in 2014.[29] In 2012, prior to its accelerated program, UGI had a total of more than 1,800 miles of cast iron, wrought iron, and bare steel main on its system. In its accelerated program, UGI committed to remove all cast iron main within 14 years (by 2027) and all bare steel main within 28 years (by 2041). As of December 31, 2023, UGI had replaced more than 677 miles of high-risk main.[30] The Company is on track to remove all cast iron by February 2027.[31]

Q. **WHY IS IT NOT ENOUGH TO SIMPLY REPAIR AGING PIPELINES WHEN THEY LEAK?**

A. As mentioned above, these materials are well beyond their intended life span and may require extraordinary measures once they have been disturbed. Allowing such safety conditions to persist until a leak occurs would not be prudent and could be catastrophic as indicated by past fatalities and injuries related to cast iron pipelines. PHMSA requires that pipeline operators survey

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[28] For example, Act 11 of 2012 ("Act 11") authorized Pennsylvania utilities to adopt a long term infrastructure replacement program supported by accelerated cost recovery. In addition, Act 11 authorized utilities to file a base rate case using a fully projected future test year, further reducing regulatory lag and ensuring sufficient funding for intensive infrastructure replacement.

[29] *See* the Petitions for Long Term Infrastructure Improvement Plans filed by the UGI LDCs at Docket Nos. P-2013-2398833, P-2013-2397056, and No. P-2013-2398835.

[30] *See* UGI Utilities, Inc. – Gas Division Annual Asset Optimization Plan, Docket No. M-2024-3046954.

[31] *See* Petition of UGI Utilities, Inc. – Gas Division for Approval of its Third Long Term Infrastructure Improvement Plan, filed on August 16, 2024 at Docket No. P-2024-3050769.

their distribution pipelines periodically, identify leaks and repair them based on the urgency of the leak. The repair of those leaks is within the operator's regular operating and maintenance requirements. By contrast, accelerating the replacement or rehabilitation of the highest-risk pipe addressed in PHMSA's Call to Action requires operators to take extraordinary action beyond the wait-and-see approach of merely plugging leaks. Wise safety management mandates a more proactive replacement-focused approach. Solely repairing vintage facilities does not accomplish PHMSA's safety objectives.

Q. IS THE CALL TO ACTION STILL AN ONGOING CONCERN?

A. Yes, it is. Congress enacted the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, requiring the Secretary of Transportation to conduct a survey to measure the progress that operators were making in replacing cast iron gas pipelines, which PHMSA keeps current on its website.[32] Although it has been more than a decade since the Department of Transportation's initial Call to Action, the Department appears to remain laser focused on ensuring that high risk pipe is removed from the natural gas distribution system as soon as possible. The initial Call to Action, follow up reports, Safety Alerts and Advisories all remain in effect.

Moreover**,** the recently enacted Bipartisan Infrastructure Law of 2021 authorized a new Natural Gas Distribution Infrastructure Safety and Modernization Grant Program to repair, rehabilitate or replace municipal or community-owned distribution pipeline systems to reduce safety incidents and avoid economic loss. The law appropriated $1 billion to that cause for fiscal

[32] Public Law 112-90, 125 stat 1904 (Jan. 3, 2012).

years 2022 through 2026. Already PHMSA has issued more than $500 million in grants to communities and municipalities.

Finally, PHMSA recently sent a letter to this Commission noting the existence of 392.56 miles of cast iron mains remaining in the District and requesting that those types of pipes "be monitored and accelerated as much as possible by the DCPSC until all high-risk pipe has been removed."[33]

Q. ARE ANY OF THE AWARDEES OF PHMSA FUNDING SIMILARLY SITUATED TO THE SYSTEM IN THE DISTRICT?

A. Yes. It is worth highlighting that the PHMSA program has focused significant funding on utilities with profiles similar to Washington Gas's system in the District. Specifically, PHMSA has granted funding to the City of Richmond and Philadelphia Gas Works ("PGW"). The City of Richmond's system included facilities that were more than 170 years old at the time they were awarded funding, and were comprised of cast iron, ductile iron and bare steel.[34]

PGW, in particular, shares many of the circumstances that Washington Gas faces in the District. Philadelphia was an early natural gas adopter, and therefore has one of the oldest natural gas systems in the country, disproportionately comprised of cast iron. As of the end of calendar year 2021, 56% of the PGW system was comprised of at-risk distribution mains including

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[33] *See* Letter from Zach Barrett, PHMSA Director of State Programs to Public Service Commission of the District of Columbia Chairman Thompson, May 13, 2024 at 2.

[34] *See Biden-Harris Administration Announces Availability of Nearly $200 Million in Grants to Fix Aging Natural Gas Pipes*, Reduce Energy Costs, U.S. Department of Transportation press release issued June 18, 2024. https://www.transportation.gov/briefing-room/biden-harris-administration-announces-availability-nearly-200-million-grants-fix

1,246 miles of cast iron.[35] Similar to the District, PGW is also doing replacement work in a dense urban environment with narrow, highly trafficked streets and older building infrastructure. PGW's Third Long Term Infrastructure Plan committed to 30.4 to 31.55 miles of vintage facilities replacements per year for the five-year period from 2023 through 2027.[36] Despite the significant commitment by PGW, in its 2023 awards, PHMSA granted PGW more than $75 million to accomplish further replacement activities.[37] As shown by Congress' action and the PHMSA grants, replacement of high-risk pipe is an ongoing concern and focus.

Q. HAS PHMSA'S EXPANSION OF AUTHORITY TO INCLUDE EMISSIONS MINIMIZED ITS FOCUS ON REMOVAL OF VINTAGE MATERIALS?

A. No. In recent years, PHMSA has seen its authority expand to include minimizing greenhouse gas ("GHG") emissions. Congress passed the Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020 ("PIPES Act 2020") to strengthen PHMSA's jurisdiction to minimize methane emissions to improve public safety and the environment. This expansion of authority was in response to the current Administration's goal to address climate change in keeping with its aggressive climate-related timelines. One important mechanism to reach that goal is to reduce the GHG emissions associated with the transportation of natural gas by pipeline. PHMSA has issued regulations

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[35] *See* Petition of Philadelphia Gas Works for Approval of its Third Long-Term Infrastructure Improvement Plan for the Period Beginning September 1, 2022 and Ending August 31, 2027, at Docket No. P-2022-3032303 (Order entered August 25, 2022).

[36] *Id.*

[37] *See* PHMSA FY 2023 Natural Gas Distribution Infrastructure Safety and Modernization Grants, https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-05/PHMSAFY2023NaturalGasDistributionInfrastructureSafetyandModernizationGrantAwards-Website5.30.24.pdf

that expedite actions to address leaks on natural gas distribution facilities to reduce methane emissions. The need to replace high risk pipelines is consistent with these guidelines. In its June 2021 Advisory Bulletin addressing methane leaks, PHMSA reiterated that, in addition to addressing emissions, the PIPES Act of 2020 also "requires [operator's plans] to address the replacement or remediation of pipelines that are known to leak due to their material (including cast iron, unprotected steel, wrought iron, and historic plastics with known issues…49 U.S.C. 60108(a)2)(E))."[38]

In addition to DOT, other federal agencies, too, have remained committed to natural gas pipeline modernization. In 2014, for example, DOE launched a Natural Gas Infrastructure Modernization Initiative to improve safety and reduce methane emissions by, among other ways, accelerating pipeline replacement. In 2016, NARUC and DOE initiated a 3-year technical partnership on accelerating infrastructure modernization and repair to gas distribution pipelines. From 2016 until 2024, the Environmental Protection Agency ("EPA") oversaw a Voluntary Methane Challenge Partnership with local distribution companies ("LDCs") many of which committed to pipeline replacement projects to decrease methane emissions. While reducing methane emissions has become an important federal policy, this has not meant a move away from accelerating pipeline replacements. Indeed, pipeline replacements play a key role in reaching that goal, as acknowledged by many federal agencies and the District itself. As the Commission has noted "even as the District undergoes its

[38] *See* PHMSA Advisory Notice, Pipeline Safety: Statutory Mandate to Update Inspection and Maintenance Plans to Address Eliminating Hazardous Leaks and Minimizing Releases of Natural Gas from Pipeline Facilities (Jun. 3, 2021), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2021-06/PHMSA%20Advisory%20Bulletin%20-%20PIPES%202020%20Section-114_0.pdf.

energy transition… a strategically focused pipe replacement program needs to be considered to avoid cascading leaks in the future by replacing aging, leak prone high-risk mains and services, thereby enhancing the safety, reliability, and GHG emissions for District residents."[39]

Q. WHAT ARE YOUR RECOMMENDATIONS WITH RESPECT TO ACCELERATING PIPELINE REPLACEMENT FOR THE DISTRICT OF COLUMBIA?

A. In preparation for my testimony, I have had an opportunity to review the data associated with the current status of the Company's distribution pipeline infrastructure, as well as its past and current plans for accelerated removal of vintage pipe. I recommend that **at a bare minimum** this Commission approve the District SAFE plan for pipeline replacement, and not back away from continuing those efforts as the District moves towards its climate goals. To the contrary, I recommend that the Commission use every tool within its regulatory toolkit to further expedite removal of the highest risk pipe, and, if necessary, lead a District-level Call to Action to ensure that all affected agencies prioritize removal of high-risk pipe in the fastest, safest, most environmentally responsible, and least costly manner possible for District residents.

As noted above, the District has the unfortunate distinction of operating with the highest percentage of cast iron distribution main in the country—close to two times more than its closest statistical neighbor, Rhode Island, which is the second on the list. The majority of that cast iron pipeline is more than 100 years old, with more than one-seventh that has a vintage that is pre-1900s. In

[39] Order 22203 at para. 47 (Jun. 12, 2024).

addition, since the Call to Action was issued, the District's cast iron replacement has lagged drastically behind that of the average state. It is not time to turn back now, but to redouble its efforts. In addition to cast iron, the pipeline system contains not insignificant quantities of other high-risk pipeline that is targeted for removal, including bare steel (22 main miles and 7,798 services), vintage mechanically coupled wrapped steel pipe (23 main miles and 1,107 services), wrapped steel pipe without cathodic protection (54 main miles and 13,479 services), copper pipe (12,495 services) and pre-1975 vintage plastic pipe (7,628 services). The District's bare steel pipe has already demonstrated how vulnerable it is to incident. Similar to cast iron, the replacement of bare steel pipe in the District has been far behind other jurisdictions since the Call to Action was initiated. In total, 481 of the District's approximately 1200 miles of main qualifies as high-risk pipe. More than half of its distribution main was either built before the 1940s or is of unknown vintage. To permit this situation to remain unabated or to stall or not adequately support and fund future efforts to remove vintage pipe would not be just or reasonable and it would not further public safety in the District.

As a resident of the District, I am well aware of pipeline and other street-related construction practices. In 2018, Washington Gas replaced a 6" cast iron pipe in front of my home that was originally installed in 1928.

I am also aware of the many extraordinary challenges that the District brings to construction as the nation's capital and the leader of the free world, with the residences of the President, Vice-President, as well as other secure facilities including the United States Congress, the Supreme Court, security agencies, along with many foreign embassies and ambassadors, national park

lands and corporate offices. Challengingly, the ratepayer base is quite small with only around 165,000 natural gas customers, with approximately half of the system throughput going to federal entities. District streets sometimes seem to be in a permanent state of unrest between construction related to potholes, fiber optic cables, water and sewer mains, electric lines, and/or natural gas pipelines. From potholes to pipelines, these underground arteries are critical to the District and its continued operation, but the challenges are legion as demonstrated by the too frequent water main breaks and man-hole blow outs. Those challenges extend to the District's status as an early adopter of gas pipelines, dating to the 1840s, some of which probably remain in service to this day. As a former pipeline safety regulator, I concur with the Commission's stated view that the District's pipelines made of high-risk materials pose an imminent threat, and that it is of paramount importance they be replaced.

Q. WHAT POLICIES CAN THE DISTRICT OR COMMISSION ADOPT THAT WILL FACILITATE A BETTER AND MORE EFFECTIVE APPROACH TO ACCELERATED REPLACEMENT WORK?

A. The most important and key best practice for positively affecting accelerated pipeline replacement work is the same as for any utility work: coordination and communication. Just as everyone digging a hole by now should know from PHMSA's Pipeline Safety 811 "call before you dig" initiative—call once. The "Call 811" safety initiative was to get ahead of underground utility work by ensuring good coordination and communication among underground utilities initially to avoid pipeline safety incidents. The obvious next step is to ensure the same sort of coordination and communication occurs when utility construction happens by digging only once.

The "dig once" principle has already been embraced by the Federal Highway Administration to allow broadband installations during other road improvement projects.[40] Any state (or the District) that receives federal highway funds is required to assign a broadband utility coordinator to facilitate right of way construction efforts. The National League of Cities also endorses dig once policies for infrastructure projects.[41] The purpose of the policy, regardless of how many holes are dug, is to coordinate the excavation phase of major infrastructure projects through good communication. Minimizing the number of holes dug and optimizing the number of jobs done is the essence of that policy.[42] A policy initiative in this vein would go a long way towards improving coordination and communication among utilities and would also reduce project costs and local community impacts caused by the repeated opening of the street. Street repaving can be a major source of emissions,[43] and work that can be coordinated so that paving only needs to happen once would be in keeping with the District's climate objectives.

In addition to improving coordination and communication among utilities, it is important that all the District government affected agencies come to the table to consider existing policies that may hamper achieving the goal of expediting removal of aging infrastructure. All key stakeholders should discuss

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[40] *See* 23 C.F.R. 645.

[41] *See* https://www.jlc.org/article/2023/05/18/building-resilient-communities-the-power-of-dig-once-policies/.

[42] *See* "'Dig once' could help states manage material and worker shortages," McKinsey & Company, Public Sector Article (Aug. 24, 2022) (identifying challenges and advantages), https://www.McKinsey.com/industries/public-sector/our-insights/dig-once-could-help-states-manage-material-and-worker-shortages.

[43] *See generally* The Carbon Footprint of Asphalt Pavements, A Reference Document for Decarbonization, Shacat, Willis and Ciavola, published March 202 (on behalf of the National Asphalt Pavement Association) https://www.asphaltpavement.org/uploads/documents/Climate/NAPA-SIP109-TheCarbonFootprintOfAsphaltPavements-March2024.pdf

and be flexible about practices and policies that might overburden or inhibit the accelerated pipeline replacement project from moving forward. It may not be possible to make legal or policy changes overnight, but it should be feasible to agree to a set of project-specific operating stipulations to cut unnecessary red tape going forward.

Q. **HOW SHOULD THE COMMISSION CONSIDER THE IMPACTS OF THE DISTRICT'S ELECTRIC RELIABILITY INITIATIVE IN APPROVING ACCELERATED REPLACEMENT WORK?**

A. The District's DC PLUG Initiative, in partnership with PEPCO, to improve the District's electricity grid's reliability and resilience, is one that as a DC resident I heartily endorse. As a former safety regulator, I also endorse the opportunity to improve safety outcomes for electric utilities by burying lines wherever it is feasible. As a former pipeline safety regulator, I view the initiative both as a challenge and an opportunity. It is a challenge because of the number of public utilities, often antiquated, already buried in spaghetti like right-of-ways throughout the District. This is a particular challenge in the District where the natural gas distribution (as well as water and sewer) pipelines are ancient. In situ cast iron mains, of which there are hundreds of miles, have been serving the District safely and soundly for a century, on average. Those distribution mains have been operating so far, largely untouched. However, as discussed above, cast iron of that vintage must be handled gently. Water main breaks, changes in weather conditions, and earth movement from construction, such as that planned in DC PLUG, in the vicinity of old cast iron pipes pose risks that could lead to catastrophic results. The best course of action from a safety perspective is to replace the cast iron mains and any associated vintage

services near planned DC PLUG projects. The DC PLUG project presents an opportunity for this Commission to resolve two important safety issues for the District at once. I strongly urge the District to approach it as such. Not doing so will likely lead to significant impacts on the public, whether it be through a reduction in safety and reliability, or through increased leaks, cost, and inconvenience.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

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PROFESSIONAL EXPERIENCE

Distinguished Fellow, Global Energy Center October 2014 - Present
Atlantic Council Washington, DC

Advise on international energy security, the responsible development of energy resources, and energy governance issues. Provide strategic foresight to address critical energy challenges around the world.

Administrator, Pipeline & Hazardous Materials Safety Administration November 2009 - October 2014
Department of Transportation Washington, DC

Led 500 professional employees, including transportation specialists, engineers, lawyers, and economists, in five regions with a $200+ million budget. Oversaw a complex mission that ensured the safe transportation of: (1) energy products by more than 2.6 million miles of pipelines; and (2) about 1 million daily hazardous materials movements by ship, train, truck, and airplane. Represented the Administration before Congress, the media, the highest levels of foreign, federal and state governments, and the pipeline and the hazardous materials industries. Coordinated with other federal and state agencies and international bodies.

Specific Accomplishments include:

Safety/Environmental

- led the response to several high-profile, low probability, high consequence pipeline incidents;
- led the Secretary's initiative to repair, rehabilitate or replace the highest risk pipeline infrastructure;
- issued a record number of pipeline safety decisions in record time;
- issued record civil penalties for safety violations;
- closed a record number of National Transportation Safety Board recommendations;
- administered $60+ million annually in grants to states, tribes, NGO's, communities and others to improve safety;
- successfully oversaw reauthorization of two statutes;
- oversaw the lowest number of pipeline incidents with death or major incident in 30 years;
- finalized more than 45 rules on important safety issues;
- led the Secretary's initiative to improve the transportation of crude by rail;
- in 2010, oversaw the lowest number of hazmat incidents with death or major incident; and
- reengineered the special permits and approvals programs for all transportation modes;

Administrative

- issued streamlined 5-year strategic plan;
- improved low employee morale, safety culture, training, communication, management, and job satisfaction levels, leading to marked increase in employee survey results;
- reformed agency organization and ailing budget, finance, and HR administrative functions;
- cut days to hire almost in half;
- issued 90% of agency's administrative policies;
- increased budget and staffing levels; and
- increased public profile through more transparency, improved data, website, and social media use.

Partner September 1999 - November 2009
Steptoe & Johnson, LLP Washington, DC

Practiced transportation and natural resources law. Represented clients before the Surface Transportation Board, the Department of Transportation, the Federal Energy Regulatory Commission (FERC), the Department of the Interior, and various other agencies as well as in state and federal courts.

Presidential Transition Agency Review Team November - December 2008
Department of Energy Washington, DC

Prepared the Department's General Counsel's office, the Office of Hearing and Appeals, the Energy Information Agency, and the Office of Fossil Energy for transition to a new incoming Secretary of Energy.

Director, Minerals Management Service March 1995 - February 1999
United States Department of the Interior Washington, DC

Led an agency (now known as the Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement and Office of Natural Resources Revenue) of 1800+ professional and technical employees located across the US with $215+ million budget and two complex missions. Oversaw oil, gas and mineral leasing, exploration, development and pipeline safety on the nation's outer continental shelf, including the initial development of deepwater energy resources and strategy about offshore wind development. Collected billions in revenue from oil, gas and minerals production on Federal and Indian lands. Disbursed revenue to tribes, states, and the Treasury. Oversaw 20+ attorney appellant function as well as compliance with numerous environmental and safety laws.

Specific Accomplishments include:

- negotiated agreements to settle billion dollar claims on leases subject to moratoria offshore Alaska and Florida;
- resolved hundreds of millions of dollars in disputed royalty claims;
- assisted in passage of several federal laws;
- streamlined agency operations (decreased personnel 12% and operated without a budget increase for 4 years);
- managed 3 record-breaking Gulf of Mexico oil and gas lease sales in a row;
- modernized information systems for Year 2000 compliance and inaugurated popular, easy-to-use website;
- oversaw research into important ocean-related environmental, safety and technical matters;
- collected an additional $1 billion in royalty compliance efforts;
- developed innovative GovWorks acquisition program; and
- won the Vice President's Hammer Award for Reinvention of Government.

Deputy Director & **Acting Director, Minerals Management Service** July 1993 - March 1995

Chief Financial Officer and Chair of Internal Controls and Information Resources Management Boards.

Interim Management Team, Office of Surface Mining November 1993 - March 1994
United States Department of the Interior Washington, DC

Managed the daily operations of the agency during the search for, and confirmation of, a new Director. Consulted with staff and constituents to create a detailed action plan that was implemented by that Director. Received the Department of the Interior's Unit Award for Excellence of Service for contribution to that effort.

Associate July 1988 - July 1993
Steptoe & Johnson, LLP Washington, DC

Litigated and practiced administrative law before federal and state courts, the Interstate Commerce Commission, and FERC. Wrote briefs, took depositions, cross-examined witnesses, and argued motions.

Attorney May 1987 - June 1988
Benson & McKay Kansas City, MO

Participated in historic *Missouri v. Jenkins* school desegregation case. Second-chaired oral argument in 8th Circuit, cross-examined witnesses on busing at District Court, took depositions, and wrote briefs.

Cost Engineer May 1983 - August 1984 & Summer 1985
International Business Machines Corporation Owego, NY

Developed, analyzed and negotiated with Navy for computer systems for use in AWACS & other aircraft.

EDUCATION

Juris Doctorate May 1987
Columbia University New York, NY

Columbia Journal of Environmental Law, Executive Editor. Charles Evans Hughes Scholar.

Bachelor of Science, Industrial Engineering March 1983
Northwestern University Evanston, IL

National Achievement Scholar. National Action Council for Minorities in Engineering Scholar. Alpha Lambda Delta Honor Society. Phi Eta Sigma Honor Society. Dean's List. Resident Assistant.

PROFESSIONAL AFFILIATIONS

Independent Chair & Member, Quality Review Board May 2019 – October 2023
NiSource, Inc. Various

Assisted with the development, implementation, oversight and review of a Safety Management System after the Columbia Gas of Massachusetts pipeline incident in Merrimack Valley, Massachusetts.

Institute of Energy Law 2002 - 2009
Executive Committee

Columbia University Law School Alumni Association of Washington, DC 2000 - 2009
President & Board Member

Natural Gas Magazine 2000 - 2009
Advisory Board

Missouri/District of Columbia Bar Member 1987/1988 -

CIVIC AFFILIATIONS

Northwestern University 2022 - Present
Civil & Environmental Engineering, External Advisory Board Member Evanston, IL

Provide strategic advice on important Civil & Environmental Engineering department matters.

The Field School 2022 - Present
Board of Trustees Washington, DC

Provide oversight of a non-sectarian, non-profit, independent, private co-educational institution in DC.

Anacostia Watershed Society 2016 - 2022
Board Member

Provide oversight to help improve the water quality of the Anacostia River and its tributaries.

Gift of Adoption 2016-Present
Capital Region Chapter Board

Helped to inspire adoption by providing grants to qualified parents in the DC metropolitan area.

American Friends of the New Acropolis Museum 2008-2009
Founding Board Member

Supported opening and successful operation of New Acropolis Museum in Athens, Greece.

Shakespeare Theatre Company 2005-2009
National Council

Assisted the Shakespeare Theatre Company in broadening its reach nationally and internationally.

Columbia Hospital for Women 2000-2002
Board of Directors, Legal Committee

Assisted in the oversight and eventual closure of the hospital.

* * *

References & Publications Available Upon Request

CONGRESSIONAL TESTIMONY
by
Cynthia L. Quarterman

- June 3, 2014: SURFACE TRANSPORTATION REAUTHORIZATION

Senate Committee on Commerce, Science, and Transportation: Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety, and Security hearing to examine surface transportation reauthorization, focusing on examining the safety and effectiveness of transportation systems;

- May 20, 2014: REVIEW OF THE PIPELINE SAFETY, REGULATORY CERTAINTY, AND JOB CREATION ACT OF 2011

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing entitled ``A Review of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011'';

- April 3, 2014: APPROPRIATIONS--DEPARTMENT OF TRANSPORTATION MODES

Committee on Appropriations: Subcommittee on Transportation, Housing and Urban Development, and Related Agencies hearing on Oversight of Department of Transportation Modes;

- April 2, 2014: EXAMINING ISSUES FOR HAZARDOUS MATERIALS REAUTHORIZATION

House Committee on Transportation and Infrastructure: Subcommittee on Railroad, Pipelines, and Hazardous Materials hearing entitled ``Examining Issues for Hazardous Materials Reauthorization'';

- March 6, 2014: RAIL SAFETY

Senate Committee on Commerce, Science, and Transportation Subcommittee on Surface Transporation and Merchant Marine Infrastructure, Safety, and Security hearing to examine enhancing our rail safety, focusing on current challenges for passenger and freight rail;

- February 26, 2014: OVERSIGHT OF PASSENGER AND FREIGHT RAIL SAFETY

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing entitled ``Oversight of Passenger and Freight Rail Safety'';

- January 28, 2013: PIPELINE SAFETY

Senate Committee on Commerce, Science, and Transporation, field hearing on “An On-the-Ground Look at Safeguarding the Public” in Charleston, WV;

- October 18, 2011: PIPELINE SAFETY

Senate Committee on Commerce, Science, and Transportation: Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety, and Security concluded a hearing to examine pipeline safety since San Bruno and other recent incidents;

- July 20, 2011: YELLOWSTONE RIVER OIL SPILL

Senate Committee on Environment and Public Works: Subcommittee on Transportation and Infrastructure oversight hearing to examine the Yellowstone River oil spill;

- July 15, 2011: LEGISLATIVE MEASURES

House Committee on Energy and Commerce: Subcommittee on Energy and Power hearing entitled ``The American Energy Initiative'' focused on legislation regarding the ``Pipeline Infrastructure and Community Protection Act of 2011.'";

- July 14, 2011: PIPELINE SAFETY

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing entitled ``Silvertip Pipeline Oil Spill in Yellowstone County, Montana'';

- June 16, 2011: AMERICAN ENERGY INITIATIVE

House Committee on Energy and Commerce: Subcommittee on Energy and Power hearing entitled ``The American Energy Initiative.'' The hearing focused on pipeline safety oversight;

- June 2, 2011: DOMESTIC OIL AND NATURAL GAS

House Committee on Natural Resources: Subcommittee on Energy and Mineral Resources hearing entitled ``Domestic Oil and Natural Gas: Alaskan Resources, Access and Infrastructure.'' ;

- April 12, 2011: REDUCING REGULATORY BURDENS AND ENSURING SAFE TRANSPORTATION OF HAZARDOUS MATERIALS

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing on Reducing Regulatory Burdens and Ensuring Safe Transportation of Hazardous Materials;

- September 28, 2010: PIPELINE SAFETY

Senate Committee on Commerce, Science, and Transportation: Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety, and Security hearing to examine pipeline safety, focusing on assessing the San Bruno, California explosion and other recent accidents;

- September 23, 2010: PIPELINE SAFETY OVERSIGHT/LEGISLATION

House Committee on Energy and Commerce: Subcommittee on Energy and Environment hearing entitled ``Pipeline Safety Oversight and Legislation.'';

- July 21, 2010: PIPELINE SAFETY PUBLIC AWARENESS

House Committee on Transportation and Infrastructure: Subcommittee on Railroad, Pipelines, and Hazardous Materials hearing on Pipeline Safety Public Awareness and Education;

- July 15, 2010: HAZARDOUS LIQUID PIPELINES INTEGRITY MANAGEMENT

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing on the Safety of Hazardous Liquid Pipelines (Part 2): Integrity Management;

- June 29, 2010: HAZARDOUS LIQUID PIPELINE SAFETY

House Committee on Transportation and Infrastructure: Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing on the Safety of Hazardous Liquid Pipelines: Regulated vs. Unregulated Pipelines;

- June 24, 2010: PIPELINE SAFETY

Senate Committee on Commerce, Science, and Transportation: Subcommittee on Surface Transportation and Merchant Marine, Infrastructure, Safety, and Security hearing to examine ensuring the safety of our nation's pipelines;

- MAY 20, 2010: PIPELINE SAFETY

House Committee on Transportation and Infrastructure, Subcommittee on Railroads, Pipelines and Hazardous Materials hearing on “Implementation of the Pipeline Inspection, Protection, Enforcement and Safety Act of 2006 and Reauthorization of the Pipeline Safety Program”;

- April 22, 2010: HAZARDOUS MATERIALS MANAGEMENT

House Committee on Transportation and Infrastructure hearing on the Department of Transportation's Oversight and Management of Hazardous Materials Special Permits and Approvals;

- September 23, 2009: NOMINATIONS

Senate Committee on Commerce, Science, and Transportation: Committee hearing to examine the nomination of Cynthia L. Quarterman, of Georgia, to be Administrator of the Pipeline and Hazardous Materials Safety Administration, of the Department of Transportation;

- May 31, 1998: ROYALTY ENHANCEMENT ACT

House Committee on Resources: Subcommittee on Energy and Mineral Resources hearings on H.R. 3334, Royalty Enhancement Act of 1998, (Part II);

- May 14, 1998: OVERSIGHT--OUTER CONTINENTAL SHELF OIL AND GAS LEASING

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on Outer Continental Shelf Oil and Gas Leasing;

- May 3, 1998: ROYALTY ENHANCEMENT ACT

House Committee on Resources: Subcommittee on Energy and Mineral Resources hearing on H.R. 3334, Royalty Enhancement Act of 1998;

- February 26, 1998: INTERIOR DEPARTMENT--MISCELLANEOUS BUDGET REQUESTS

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on the Administration's FY 1999 budget request for three agencies within the Department of Interior: Office of Surface Mining, Minerals Management Service, and the Energy and Minerals programs of the Bureau of Land Management;

- July 31, 1997: OVERSIGHT

House Committee on Resources: Subcommittee on Energy and Mineral Resources held an oversight hearing on Royalty-In-Kind for Federal oil and gas production;

- July 25, 1996: OVERSIGHT--OUTER CONTINENTAL SHELF MORATORIA

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on Outer Continental Shelf moratoria;

- June 27, 1996: OVERSIGHT--NATURAL GAS-ROYALTY-IN-KIND PILOT PROGRAM

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on Royalty-In-Kind for natural gas (lessons learned from the Gulf of Mexico pilot program);

- June 17, 1996: CAN THE UNITED STATES INCREASE OIL ROYALTIES?

House Committee on Government Reform and Oversight: Subcommittee on Government Management, Information and Technology held a hearing on ``Can the United State Increase Oil Royalties?'';

- March 7, 1996: MINERAL MANAGEMENT SERVICE ORGANIC ACT

House Committee on Resources: Subcommittee on Energy and Mineral Resources hearing on H.R. 1813, Minerals Management Service Organic;

- September 14, 1995: FEDERAL OIL AND GAS LEASING

Senate Committee on Energy and Natural Resources: Subcommittee on Energy Production and Regulation concluded hearings on the following bills: S. 1014, to improve the management of royalties from Federal and Outer Continental Shelf oil and gas leases;

- July 27, 1995: OVERSIGHT

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on the management alternatives of Outer Continental Shelf oil and gas resources, including the Administration's proposals to (1) sell the royalty stream, and (2) transfer of the Minerals Management Service to another Federal agency;

- July 9, 1995: INTERIOR APPROPRIATIONS

Committee on Appropriations: Subcommittee on Interior and Related Agencies held a hearing on the Minerals Management Service, the Commission of Fine Arts, the Advisory Council on Historic Preservation, and on the Woodrow Wilson International Center for Scholars;

- February 14, 1995: OVERSIGHT

House Committee on Resources: Subcommittee on Energy and Mineral Resources oversight hearing on the Office of Surface Mining and Minerals Management Service Fiscal Year 1996 budget request;

- July 26, 1994: SAND AND GRAVEL

House Committee on Merchant Marine and Fisheries, Subcommittee on Oceanography, Gulf of Mexico and other Outer Continental Shelf and House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources joint hearing on H.R. 3678 to authorize negotiations for the use of outer contInental shelf sand, gravel, and shell resources;

- June 28, 1994: COASTAL ZONE MANAGEMENT ACT REAUTHORIZATION AMENDMENTS

House Committee on Merchant Marine and Fisheries: Subcommittee on Oceanography Gulf of Mexico, and the Outer Continental Shelf and Subcommittee on Environment and Natural Resources joint hearing on implementation of the Coastal Zone Reauthorization Amendments of 1990.

Table 1: Cast Iron and Bare Steel Status Comparison across Various Accelerated Replacement Programs Highlighting Complete or Near Complete Retirements

Company	Commission	Program	Term (years)	Status 2011	Status 2023
Yankee Gas[1]	CT PURA	PRP[2]	20 in 2011	431.9 mi CI main 30 CI serv 84.28 mi BS main 18,658 BS serv	166.4 mi CI main 6 CI serv 24.58 mi BS main 2,978 BS serv
Florida Public Utilities Company[3]	FL PSC	GRIP/ GUARD[4]	10 in 2013	3 mi CI main 195 mi BS main 7,695 BS serv	0 mi CI main 0 mi BS main 0 BS serv
Central Florida Gas	FL PSC	GRIP[5]	10 in 2013	145 mi BS main 757 BS serv	0 mi BS main 0 BS serv
AGL Resources Inc.[6]	GA PSC	PRP/ STRIDE[7]	10-15 in 1998	176 mi BS main 33,582 BS serv	0.2 mi BS main 0 BS serv
Peoples Gas[8]	IL CC	SMP/AMRP[9]	20 in 2011	1544.3 mi CI main 77 CI serv 6,250 BS serv	941 mi CI main 50 CI serv 3,301 BS serv
Vectren (Indiana Gas-North & South)[10]	IN URC	Tracker[11]	7 in 2015	161 mi CI main 667 mi BS main 579 serv	4.2 mi CI main 177.24 mi BS main 4,404 BS serv
Consumers Energy[12]	MI PSC	EIRP[13]	25 in 2012	623 mi CI main 1004 mi BS main 15,308 BS serv	224.9 mi CI main 586.86 mi BS main 6,556 serv
New Jersey Natural Gas[14]	NJ BPU	SAFE I & II[15]	4+5, in 2012, 2016	66 mi CI main 469 mi BS main 37,855 BS serv	0 mi CI main 0 mi BS main 0 BS serv

[1] Docket No. 10-12-02.
[2] The Pipe Replacement Program (PRP) covered cast/wrought iron (CI) and bare steel (BS) replacement. In 2018, it was expanded to include copper services, small diameter coupled steel mains, coupled steel services, unprotected coated steel mains and services; and refused to extend term of replacement.
[3] Docket Nos. 120320-GU; PSC-2012-0490-TRF-GU.
[4] The early Gas Reliability and Infrastructure Program (GRIP) surcharge to cover cast iron and bare steel mains and services, which recovered $203 million over 10 years, was replaced in 2024 by the Gas Utility Access and Replacement Directive (GUARD) estimated to cost $215 million over 10 years, to address problematic pipes.
[5] Docket Nos. 120320-GU; PSC-2023-0103-FOF-GU.
[6] Atlanta Gas & Light, Docket Nos. 8516, 29950
[7] In 1998, the Pipeline Replacement Program (PRP) monthly surcharge was approved for 10 years to cover replacement of bare steel and cast iron pipe. In 2005, the PRP term was extended to15 years at an estimated cost of $144 million. In 2009, the Strategic Infrastructure Development and Enhancement Program (STRIDE) surcharge was created for infrastructure expansion. In 2013, that program was extended to cover replacement of vintage plastic pipes.
[8] In 2011, the System Modernization Program (SMP) to replace cast iron main was expedited with the Accelerated Main Replacement Program (AMRP). In 2013, the Illinois General Assembly passed the Natural Gas, Consumer, Safety and Reliability Act, Public act 098-0057, allowing riders, estimated at $200-250 million/year for Peoples, for gas utility upgrades between 2014 and 2023.
[9] The AMRP covers replacement of cast/wrought iron, ductile iron, unprotected coated steel, unprotected bare steel, mechanically coupled steel, copper, cellulose acetate butyrate plastic, pre-1973 DuPont Aldyl-A polyethylene, PVC or other problematic pipe.
[10] Docket Nos. 43298, 43112, 44429.
[11] In 2006, Southern Indiana Gas and Electric Company was approved for a bare steel and cast iron replacement tracker. In 2008, Indiana Gas was approved for an infrastructure replacement tracker. In 2013, the Indiana legislature passed a bill, Public Law No. 133-2013, to allow cost recovery 7-year infrastructure trackers. In 2013, Vectren predecessor companies were approved for $765 million to remove 1,100 mi of bare steel and cast iron pipe, and in 2016 approved for $890 million in their 7-year modernization plans.
[12] Docket Nos. U-16855, U-17643.
[13] In 2012, a $56 million/year main replacement program was funded. In 2015, the 25-year Enhanced Infrastructure Replacement Program (EIRP) to upgrade gas infrastructure, including 540 mi of cast iron pipe and other high-risk pipe, was approved at a rate of $75 million/yr.
[14] Docket Nos. Go09010052, GR13090828.
[15] In 2009, it was approved to invest $71 million in infrastructure upgrades. In 2011, it was approved for $60 million for further upgrades in base rates. In 2012, the Safety Acceleration and Facility Enhancement (SAFE) Program was approved to replace 276 miles of cast iron and unprotected steel mains and services in four years at an estimated cost of $130 million. In 2016, it was granted an extension to SAFE (II), approving a $200 million modernization over 5 years.

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Table 1 (*Continued*): Cast Iron and Bare Steel Status Comparison across Various Accelerated Replacement Programs Highlighting Complete Retirements

Company	Commission	Program	Term (years)	Status 2011	Status 2023
AGL Resources Inc.[16]	GA PSC	PRP/ STRIDE[17]	10-15 in 1998	176 mi BS main 33,582 BS serv	0.2 mi BS main 0 BS serv
South Jersey Gas[18]	NJ BPU	AIRP	4+5, 2013,2016	236 mi CI main 955 mi BS main 31,955 BS serv	0 mi CI main 7.23 mi BS main 15,296 BS serv
New York State Electric & Gas[19]	NY PSC	Leak-prone pipe replacement[20]	24 mi & 1200 serv/yr in 2011	27.9 mi CI main 162.16 mi BS main 8,423 BS serv	2.9 mi CI main 27.56 mi BS main 4,178 BS serv
Columbia Gas Ohio[21]	OH PUC	IRP[22]	25 in 2008	231 mi CI main 3286 mi BS main 146,725 serv	70.8 mi CI main 1520 mi BS main 47,169 serv
Duke Energy[23]	OH PUC	AMRP[24]	15 in 2000	200.7 mi CI main 26 CI serv 62.02 mi BS main 6,793 BS serv	0 mi CI main 0 CI serv 0 BS main 0 BS serv
Enbridge (Dominion East Ohio)[25]	OH PUC	PIR[26]	25 in 2008	89.5 mi CI main 3597.78 mi BS main 3400 BS serv	17.9 mi CI main 3557.43 mi BS main 0 BS serv
Vectren Ohio (CenterPoint)[27]	OH PUC	DRR[28]	20 in 2009	166 mi CI main 0 CI serv 502 mi BS main 12,722 BS serv	5.4 mi CI main 5 CI serv 95.07 mi BS main 74 BS serv
Columbia Gas Virginia[29]	VA SCC	SAVE[30]	2010	4 mi CI main 235 mi BS main 3,712 BS serv	0 mi CI main 98.3 mi BS main 1,407 BS serv

Ä [illegible]

[16] Atlanta Gas & Light, Docket Nos. 8516, 29950
[17] In 1998, the Pipeline Replacement Program (PRP) monthly surcharge was approved for 10 years to cover replacement of bare steel and cast iron pipe. In 2005, the PRP term was extended to15 years at an estimated cost of $144 million. In 2009, the Strategic Infrastructure Development and Enhancement Program (STRIDE) surcharge was created for infrastructure expansion. In 2013, that program was extended to cover replacement of vintage plastic pipes.
[18] Docket Nos. GR 09110907, GR10100765, GO1100632. In 2013, the Accelerated Infrastructure Replacement Program (AIRP) was approved to spend $35.3 million/yr for 4 years to replace bare steel and cast iron mains and services. In 2016, the program was extended and approved to spend $302.5 million in 5 years.
[19] Docket Nos. 09-G-0716/09-G-0718, 15-G-0284
[20] In 2010, a leak-prone replacement schedule of 24 mi of main and 1200 services/yr was approved. In 2016, an acceleration of that schedule was approved to replace 26 mi/yr in 2017 (at a cost of $27 million/yr) and 28 mi/yr thereafter to replace leak-prone pipe in 11 years.
[21] Docket Nos. 08-72-GA-AIR, 11-5515-GA-ALT, 21-637-GA-AIR.
[22] In 2008, the Infrastructure Replacement Program (IRP) tracker was approved for the first five years of a $2.7 billion plan to replace 4,100 miles of cast/wrought iron, bare steel, and copper pipe. The IRP was extended for 5 years in 2011 and added replacement of Aldyl-A plastic pipe. In 2018, it was extended another five years.
[23] Docket No. 01-1228-GA-AIR.
[24] In 2000, an Accelerated Main Replacement Program (AMRP) was approved.
[25] Docket Nos. 08-169-GA-ALT, 09-458-GA-RDR, 11-3238-GA-RDR, 11-2401-GA-ALT, 15-362-GA-ALT, 18-1908-GA-UNC, 20-1634-GA-ALT.
[26] In 2008, the Pipeline Infrastructure Replacement (PIR) tracker was approved for the first 5 years of a 25- year program at $100 million/year for 5500 miles of main. In 2011, it was further accelerated. In 2015, the costs were approved for up to $200 million/year by 2018, plus 3% increases each year. The entire program was expected to cost $4 billion and covered bare steel, cast/wrought iron, copper, and ineffectively coated steel pipe.
[27] Docket No. 07-1080-GA-AIR, 22-738-GA-ALT, and U.S. DOT PHMSA Cast/Wrought Iron Pipeline Inventory Reports
[28] In 2009, a Distribution Replacement Rider (DRR) was approved for a 20- year program to replace 2603 miles of cast/wrought iron and bare steel pipe. In 2019, that program was extended to include pre-1971 coated steel. As of 2023, it has spent $613.16 million.
[29] Docket No. PUE-2011-00049.
[30] In 2010, the Virginia legislature enacted the Steps to Advance Virginia's Energy (SAVE) Plan Act allowing utilities to apply for a rider to recover gas replacement projects. In 2011, it approved a SAFE plan for $20 million/yr plus up to 5% for 5 years.

ATTESTATION

I, CYNTHIA QUARTERMAN, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

CYNTHIA QUARTERMAN

09/27/2024

DATE

WITNESS JACAS
EXHIBIT WG (C)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF	)	
THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	)	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

PUBLIC

DIRECT TESTIMONY OF WAYNE A. JACAS
Exhibit WG (C)
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Exhibits

EXHIBIT WG (C)

PUBLIC

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF WAYNE A. JACAS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Wayne A. Jacas, and I am the Director of Construction Program Strategy and Management ("CPSM") at Washington Gas Light Company ("Washington Gas" or "Company"). My business address is 6801 Industrial Road, Springfield, VA 22151.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY TO THE PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA ("COMMISSION") OR ANY OTHER PUBLIC UTILITY COMMISSION?

A. Yes, I testified on behalf of Washington Gas before the Commission in Formal Case Nos. 1154, 1175, and 1162 regarding Washington Gas's second and third PROJECT*pipes* Plans respectively, and PROJECT*pipes* projects to be included in the Company's base rates. I have also appeared before the Maryland Public Service Commission ("Maryland Commission") regarding the Company's accelerated pipe replacement ("ARP") programs and base rates, and the Commonwealth of Virginia State Corporation Commission ("Virginia Commission") regarding the Company's accelerated pipe replacement programs. Specifically, in Maryland Case Nos. 9486, 9708, 9605, and 9651, I testified regarding Washington Gas's second and third Strategic Infrastructure Development and Enhancement ("STRIDE 2" and "STRIDE 3") Plans and STRIDE projects to be included in the Company's base rates. In the

Commonwealth of Virginia Case No. PUR-2021-00283, I testified regarding Washington Gas's amended Steps to Advance Virginia's Energy ("SAVE") Plan. In addition, I have addressed the Maryland Commission at Administrative Meetings on various aspects of the Company's STRIDE program and participated in Technical Conferences in the District of Columbia regarding PROJECT*pipes*.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I received a Bachelor of Science degree in Civil Engineering from North Carolina State University and a Master's Certificate in Project Management from Villanova University. I am a certified Project Management Professional. I have 22 years of engineering, construction and operations experience, with 17 of those years in the natural gas industry. Prior to joining Washington Gas in 2017, I worked for North Carolina Department of Transportation, Atlanta Gas Light, Virginia Natural Gas, and Columbia Pipeline Group. My specific areas of natural gas experience have been in gas distribution, transmission, and compression. As Director of the Company's CPSM Department, I am responsible for the program management, including governance and reporting, of the Company's Accelerated Pipe Replacement Programs.

II. PURPOSE OF TESTIMONY

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of Washington Gas.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe the infrastructure replacement that has been accomplished by Washington Gas during the PROJECT*pipes* 2 Program ("PIPES 2" or the "PIPES 2 Plan"), and to explain the Company's plans for the proposed three-year District of Columbia Strategic Accelerated Facilities Enhancement Program ("District SAFE").

Q. WHAT PORTIONS OF DISTRICT SAFE ARE YOU SPONSORING?

A. I am co-sponsoring Section IV, Section V subparts (b – f) and Section VI of Exhibit WG (A) - 1 (the "Plan"). Section IV of Exhibit WG (A) – 1 includes the Company's performance under the PROJECT*pipes* Program. Section V subparts (b – e) discuss Washington Gas's performance compared to other utilities and the impacts of various restrictions in the District of Columbia. Section VI presents the proposed District SAFE Plan scope and cost estimate.

III. IDENTIFICATION OF EXHIBITS

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes, I am sponsoring one (1) additional exhibit. Exhibit WG (C) – 1 is the Company's response to the Commission's order on the Continuum management audit.

IV. PROGRAM BACKGROUND

Q. WHY DID THE COMPANY ADOPT AN ACCELERATED REPLACEMENT PROGRAM?

A. The Company adopted an accelerated replacement program in response to the federal Pipeline and Hazardous Materials Safety Administration's ("PHMSA") Call to Action, described in detail by Company Witness Quarterman. At the time of the Call to Action, significant portions of the Company's system in the District of Columbia ("District") were comprised of vintage materials, a condition that persists. In order to eliminate these leak-prone facilities and enhance the safety and reliability of the Company's gas infrastructure on an expedited and proactive basis, Washington Gas adopted a targeted program in the District. The proposed District SAFE Plan continues the Company's response to the federal government's Call to Action and extends the targeted effort to remove aging, high-risk infrastructure from the gas system while lowering Greenhouse Gas ("GHG") emissions, as discussed in detail in the Application and by other Company witnesses.

Q. PLEASE EXPLAIN THE PROCEDURAL BACKGROUND FOR THE PROJECT*PIPES* AND DISTRICT SAFE PROGRAMS.

A. The Commission approved the Company's initial plan in Order No. 17431 (approving the Revised Accelerated Pipe Replacement Plan ("Revised Plan")), subject to certain conditions provided in the order.[1] Having satisfied the Commission's conditions, Washington Gas was granted final approval of the Revised Plan in Order No. 17602.[2] Under the Revised Plan, for the first five (5)

[1] Formal Case No. 1093*, In the Matter of the Investigation into the Reasonableness of Washington Gas Light Company's Existing Rates and Charges for Gas Service, and Formal Case No. 1115, Application of Washington Gas Light Company for Approval of a Revised Accelerated Pipe Replacement Program,* Order No. 17431 (March 31, 2014)

[2] Formal Case No. 1115*, Application of Washington Gas Light Company for Approval of a Revised Accelerated Pipe Replacement Program,* Order No. 17602 (August 21, 2014).

years of the program, Washington Gas designed projects to replace: (1) bare and/or unprotected steel services; (2) bare and/or targeted unprotected steel main and affected services; and (3) cast iron main and affected services.[3] The Company further agreed to include the top three (3) Optimain[4] projects on its annual project lists.[5] On January 29, 2015, by Order No. 17789, the Commission approved the Unanimous Agreement of Stipulation and Full Settlement filed in Formal Case No. 1115, wherein the Company was authorized to implement a surcharge mechanism to recover the costs of the program ("Settlement Agreement").[6]

On December 11, 2020, by Order No. 20671, the Commission approved, in part, the Company's PIPES 2 Plan. Specifically, the Commission approved a three-year PIPES 2 Plan with a spending cap of $150 million. The Commission approved the following Company Distribution Programs: (1) bare and/or unprotected steel services; (2) bare and/or unprotected steel main and services;[7] (3) vintage mechanically coupled main and services,[8] (4) cast iron main,[9] (5) copper services, and (10) "Work Compelled by Others". Also, the Commission approved the implementation of the Company's Distribution Program 9, Advanced Leak Detection, but denied recovery of the program through the PROJECT*pipes* surcharge. The Company's PIPES 2 Plan was

[3] Formal Case Nos. 1093 and 1115, Order No. 17431 at 32.
[4] At this time, the Company uses the JANA risk model as its risk assessment tool for selecting main and service replacement projects each year. It is a probabilistic risk model, further discussed by Company Witness Stuber.
[5] Formal Case No. 1115, Order No. 17602 at 50.
[6] Formal Case No. 1115, Order No. 17789 at 37.
[7] Including contingent main and affected services.
[8] Including contingent main and affected services.
[9] Including contingent main and affected services.

extended under Order No. 21960 for one-year beginning March 1, 2024, through February 28, 2025, for an additional $50.0 million.

On December 22, 2022, the Company filed its PIPES 3 Plan in Formal Case No. 1175, proposing the third tranche of the PROJECT*pipes* program. This application was dismissed by the Commission on June 12, 2024, in Order No. 22003,[10] and Formal Case No. 1179 was opened to consider a restructured accelerated replacement plan.

Q. WHY IS WASHINGTON GAS SEEKING APPROVAL OF THE NEXT PHASE OF ITS PLAN NOW?

A. PIPES 2, including the one-year extension, will conclude on February 28, 2025. To maintain the continuity of work and critically important qualified contractor crew resources, the Company is submitting its District SAFE application as directed in Formal Case Nos. 1154, 1175, and 1179, Order No. 22003.[11] The timely approval of District SAFE will ensure the continuity between both plans and assist the Company in retaining and securing contractor resources needed to continue this accelerated replacement work. As part of this testimony, the Company is also addressing items identified in Order No. 22003.

V. PIPES 2 PROGRESS

Q. DOES WASHINGTON GAS CURRENTLY HAVE AN ACCELERATED REPLACEMENT PLAN IN PLACE?

[10] Formal Case No. 1154, *In the matter of Washington Gas Light Company's Application for Approval of ProjectPipes 2 plan*: Formal Case No. 1175, *In the Matter of Washington Gas Light Company's Application for Approval of ProjectPipes 3 plan*; And Formal Case No. 1179, *In the Matter of the Investigation into Washington Gas light Company's Strategically Targeted Pipe Replacement plan,* Order No. 22003 (June 12,2024)

[11] *Id*.

A. Yes. As noted above, Washington Gas currently has a Commission-approved replacement plan, the PIPES 2 Plan, which has been in place since 2021. The PIPES 2 Plan covers Year 7 through Year 10 of the accelerated replacement program, which includes the 12-month extension of the program through February 2025. The Company has been executing this phase of its accelerated pipe replacement plan since January 1, 2021.[12] Each year, the Company provides robust reports on program progress to the Commission pursuant to reporting requirements established by Order Nos. 20671 and 20773.[13] The Company's current PIPES 2 Plan consists of the following programs set forth in Table 1 below:

Table 1: Washington Gas's Current PIPES 2 Programs

Program No.	Program Description
1	Bare and/or Unprotected Wrapped Steel Services
2	Bare and/or Unprotected Wrapped Steel Main and Services (including Contingent Main[14] and Affected Services[15])
3	Vintage Mechanically Coupled Main and Services (including Contingent Main and Affected Services)
4	Cast Iron Main (including Contingent Main and Affected Services)
5	Copper Services
10	Work Compelled by Others[16]

[12] The Company currently has approved accelerated pipe replacement programs in Maryland and Virginia. Maryland STRIDE has been approved under Case No. 9708 for a total of $330 million over a five-year period, ending December 2028. Virginia SAVE was approved under PUR 2021 – 00283 for a total of $877.6 million over a five-year period ending December 2027.

[13] Formal Case No. 1154 Order No. 20671 (December 11,2020), Order No. 20773 (July 22, 2021)

[14] Contingent main refers to instances where non-program specific main materials (*i.e.*, pre-1975 Plastic, Protected Wrapped Steel, etc.) are encompassed within the bounds of program eligible materials and logically grouped with program eligible main for replacement.

[15] Affected services (*i.e.*, pre-1975 Plastic, Protected Wrapped Steel, Copper, etc.) will be replaced when exposed and connected to a portion of main in a program.

[16] Program 10 is comprised of the District of Columbia Department of Transportation Advance of Paving, DC PLUG, and PEPCO Capital GRID projects that intersect the Company's PIPES eligible facilities.

Q. WHAT BENEFITS HAS THE PIPES 2 PROGRAM PROVIDED TO THE COMPANY'S DISTRICT OF COLUMBIA CUSTOMERS?

A. The Company's accelerated replacement work conducted through its PIPES 2 program benefits District customers through the enhanced safety and reliability of Washington Gas's distribution system with the additional benefit of Greenhouse Gas reduction as discussed by other Company witnesses, consistent with the Company's Revised Plan approved by Commission Order No. 17431. During the PIPES 2 program, the Company successfully replaced 16.8 miles of higher-risk main and replaced 3,697 higher risk services, as of December 2023, to the benefit of its customers and the District. The Company outperformed the targets set by the Commission in Order No. 20671, completing 117% of the main replacements and 106% of the service replacements.

Additionally, the Company is providing the leak comparison tables below to show the effectiveness of *accelerated replacement activities* in reducing leaks on its aging infrastructure. These tables compare the most recent program year, 2023, with 2019, showing an overall reduction of total leaks on the system by 28%.[17] As the vintage distribution system is replaced with modern polyethylene main and services, the leak rate will decrease to near zero (*i.e.*, the leak rate of modern polyethylene pipe). The impact of the replacement of vintage materials is shown in the District SAFE Plan, provided in Exhibit WG (A) – 1.

[17] Total leak counts in the District for mains and services combined from revised PHMSA F7.100 Reports filed on August 13, 2024, and the 2023 DOT Report.

Table 2: 2019 PHMSA Leak Data vs. 2023 PHMSA Leak Data				
Leak Location	2019	2023	Change	% Change
Main Leaks	958	668	-290	-30%
Service Leaks	797	590	-207	-26%

Table 3: 2019 PHMSA Leak Data vs. 2023 PHMSA Leak Data				
Leak Type	2019	2023	Change	% Change
Corrosion Leaks	537	368	-169	-31%
Pipe, Weld, or Joints	774	482	-292	-38%

Of course, even as the effective PROJECT*pipes* and other replacement work is occurring, the balance of the distribution system continues to age. For this reason, the Company is continuing to reflect the need to further accelerate replacement activities after the three years of District SAFE proposed herein.

Q. HAVE THERE BEEN ADDITIONAL BENEFITS FROM THE COMPANY'S ACCELERATED REPLACEMENT ACTIVITIES?

A. Yes. The Company has also enhanced safety with the installation of Excess Flow Valves[18] ("EFVs") and Thermal Shutoff Valves ("TSVs"). In addition, under the PIPES 2 Plan, the Company continued to install marking technology to minimize third-party damage, associated GHG emissions and related customer outages. Finally, the Company has updated as-builts and has improved reliability through uprating low-pressure systems to medium-pressure, which

[18] The Company installs Excess Flow Valves ("EFV") with each affected service that has the potential to reduce emissions from third-party damages.

reduces the potential for water infiltration into pipelines causing outages as well as risks of over pressurization.

Q. HAS THE COMPANY REVIEWED LESSONS LEARNED?

A. Yes, the Company began formal lessons learned meetings during PIPES 1, in addition to informal discussions that occur as part of the day-to-day project management and construction activities performed. The Company currently has a project closeout process that discusses and implements changes based upon lessons learned on an individual project level with construction, project management, and the Company's construction contractor. These meetings provide insights into the evolving requirements (discussed later in my testimony) being imposed on the Company by the District of Columbia that affect future project designs and associated construction costs. Additionally, these evolving requirements are used to inform the Class 3 estimates and cost drivers.

The lessons learned meetings have identified processes that have worked well, challenges that affect the DC PIPES work, and identified changes to processes that did not work well. These meetings have facilitated continuous improvement over the duration of PIPES. For example, in PIPES 1, the Company filed annual project lists with the total project scope, rather than an annual scope, even if the project was intended to span multiple construction years. This required the Company to maintain multiple project lists at the same time without tracking annual schedule performance. Washington Gas improved this with the revised project list format in PIPES 2 and enhanced its ARP dashboards with program management metrics accordingly. The Company implemented these dashboards in 2018 and continues to refine them and will

do so again in accordance with the Continuum Management Audit ("Continuum") Recommendations discussed in Exhibit WG (C) – 1. I provide further discussion of the Continuum recommendations in Section IX of my testimony, below. Washington Gas will continue to hold both formal and informal lesson learned meetings throughout District SAFE.

VI. JUSTIFICATION FOR THE DISTRICT SAFE PLAN

Q. WHY IS DISTRICT SAFE NECESSARY?

A. Safety is a core value for Washington Gas and continuing accelerated replacement of vintage infrastructure is compatible with that core value. In addition, as described by Company Witness Quarterman, Washington Gas has a federal obligation to remove vintage materials from its system. Commission approval of the District SAFE Plan and a surcharge recovery mechanism will provide the Company with the regulatory and financial certainty necessary to accelerate the replacement of the high-risk pipe in the distribution system. The current process gives the stakeholders an opportunity to review the annual planned work in advance of Commission approval of the project lists, rather than the base rate process that provides no such opportunity.

In District SAFE, the Company has identified some of the highest-risk natural gas distribution pipes based on various factors, including assessed risk as identified through the Company's Distribution Integrity Management Plan ("DIMP"). The Company must continue replacing this higher risk pipe on an accelerated basis and should be allowed to recover the associated costs through the surcharge mechanism previously approved by the Commission.

Q. WHAT WILL DISTRICT SAFE ACCOMPLISH?

A. When the Commission approves the District SAFE Plan, the Company will be able to accelerate the pace of replacement in the proposed 3-year tranche. Prior to its accelerated replacement program, the Company's pace would take more than 100 years for removal of vintage materials. At the outset of its accelerated program, the Company committed to a 40-year timeline for replacement (*i.e.*, removal of all vintage materials by 2054). However, Company Witness Quarterman's testimony encourages the Company and the Commission to act with more haste to remove vintage materials. Therefore, the first three years of District SAFE reflect the initial phase of a reasonable ramp up toward a more accelerated pace**.**

Q. WHY IS FURTHER ACCELERATION NEEDED?

A. Further acceleration is needed because each year these facilities are left in the system, age-related threats such as corrosion increase and the risk of a safety incident increases. In addition, a ramp up is required to re-grow the Company's construction resources, because the instability caused by the regulatory uncertainty over the last 18 months and the significant drop in the Commission-approved budget for this work caused the Company to lose crews that took many years to secure.

Q. WHY DOES IT TAKE TIME TO BUILD CREWS?

A. Underground natural gas construction crews are some of the most skilled and highly trained field workers in the District. They require extensive training before they are qualified to safely perform work on natural gas facilities. The

Company's contractors invest significant resources to get its workers field qualified, and once they are, it is important that there is a steady stream of projects in order not to lose these workers to other areas of the country or to different utility/infrastructure work opportunities.

VII. STRUCTURE AND OBJECTIVES OF DISTRICT SAFE PLAN

Q. PLEASE DESCRIBE WHAT IS IN THE DISTRICT SAFE PLAN.

A. The Plan contains a comprehensive roadmap of where the system is today, what has been done over the last ten years, the Company's plan for replacing targeted high-risk infrastructure over the next three years, and what the future needs are for this system. This plan includes detailed information related to the circumstances in the District that will impact the timing and cost of replacement activities.

Q. HAS THE PROPOSAL FOR DISTRICT SAFE CHANGED FROM THE PREVIOUSLY APPROVED PIPES 2 PLAN?

A. For the portion of the Plan I am sponsoring, the Company is not fundamentally altering the District SAFE Plan approach from what the Commission approved through the PIPES 2 proceeding. Overall, the Company will continue to target the same vintage materials that comprise PIPES 2, while incorporating the Company's experiences and lessons learned. However, the District SAFE Plan has incorporated the Commission's requirements in Order No. 22003, offering

targeted replacements of some of the highest risk pipes in the Company's distribution system.

Q. HOW HAS THE COMPANY MODIFIED THE PROGRAM STRUCTURE TO ALIGN WITH THE COMMISSION'S ORDER?

A. The Company is no longer breaking out its planned work into the programs that were used in PIPES. Instead, the Company is focused on replacing eligible materials based on the JANA risk model and the risk-reduced-per-dollar-spent metric regardless of material type to maximize benefits and efficiently remove the most risk from the distribution system.

The Company will continue to address work compelled by others (*i.e.*, District of Columbia Department of Transportation Advance of Paving work). The Company's accelerated replacement program has encountered persistent and increasing pressure to complete work compelled by others as it relates to the replacement of bare steel, unprotected wrapped steel, vintage mechanically coupled wrapped steel, and cast-iron main, including contingent main and affected services, on timelines that would otherwise conflict with the Company's annual risk-based work prioritization. However, the mains inventory eligible for replacement under work compelled by others continues to be the population of materials identified as high-risk. Accelerating its replacement will reduce risk and enhance the safety of the Company's distribution system by making sure that the piping is replaced faster than the Company's risk-based schedule would provide for, clearing the way for other infrastructure projects that are important

to the District, and avoiding adverse impacts arising from the construction activities of other entities. In addition, accelerating the replacement of these facilities reduces future impacts on customers and local businesses by eliminating the need for duplication of construction zones and repetitive disruption to the community that would otherwise occur if the work was completed out of sync with the work compelled by others. Construction work on or immediately adjacent to the Company's existing aging facilities, most importantly cast iron, has an increased leak risk due to the ground movement impacts on the vintage pipe, as discussed by Company Witness Quarterman.

Q. HOW WILL MAIN PROJECTS BE SELECTED FOR REPLACEMENT UNDER THE DISTRICT SAFE PLAN?

A. Main projects will be initially identified by the Company's JANA risk model. Washington Gas will review the risk profile of all main projects within District SAFE. The Company will identify and prioritize those projects with the highest risk scores. However, because the risk scores are calculated without considering relative economics and operational considerations, the Company will also target those projects that optimize reductions in risk on a risk-reduced-per-dollar-spent basis which was approved in Formal Case No. 1154, Order No. 20671. Company Witness Stuber discusses the Company's new risk-ranking tool and methodology.

In addition, as was approved by the Commission in PIPES, projects may be selected due to operational considerations and as a result of direct field

assessments or to avoid future leaks from heavy construction around cast-iron mains that are then susceptible to cracking and increased joint leaks.

Q. HOW WILL SERVICE-ONLY PROJECTS BE SELECTED FOR REPLACEMENT UNDER THE DISTRICT SAFE PLAN?

A. To maximize the construction efficiency of replacing bare steel, vintage mechanically coupled, unprotected wrapped steel, and copper services within the Company's District distribution system, the Company will use key factors in prioritizing the replacement of such services. Most of the services in the District SAFE Plan will be replaced in conjunction with main replacement projects. Services not being replaced in conjunction with main replacements will be grouped geographically by the Company. Each geographic area will then be ranked from highest risk to lowest using the Company's risk-ranking tool and prioritized using the same risk-reduced-per-dollar-spent metric. The risk will be determined by the Company's JANA risk-model discussed in Company Witness Stuber's testimony.

Q. WILL ADVANCE LEAK DETECTION ("ALD") BE USED IN THE PRIORITIZATION OF THE MAIN AND SERVICE ONLY REPLACEMENT PROJECTS IN DISTRICT SAFE?

A. Washington Gas is not proposing the direct use of ALD for District SAFE at this time because the Company is awaiting new PHMSA regulations that may direct how natural gas companies deploy ALD. Washington Gas will prioritize and

design the District SAFE project list based on the JANA risk model and other considerations to remove the most risk from the system and avoid future leaks.[19] As the Company continues to perform ALD on its system, the results will be incorporated into the Company's JANA risk model to inform future risk prioritization.

Q. DOES THE COMPANY HAVE A METHOD FOR TRACKING ESTIMATED LEAK REDUCTIONS AND GHG EMISSIONS REDUCTIONS THAT CONSIDERS THE ACTUAL CONDITION, PREVIOUS LEAKS, AND MATERIAL TYPE OF THE PIPES ACTUALLY REPLACED (IN CONTRAST TO THE CURRENT APPROACH FOR CALCULATING FUGITIVE EMISSIONS, WHICH RELIES ON GENERAL ASSUMPTIONS BASED ON THE PIPE MATERIAL)?[20]

A. The Company does not have an alternative methodology that factors in all of the elements outlined by the Commission in its Order. To the Company's knowledge, there is no single method of tracking estimated leak reductions and GHG emission reductions that considers actual condition, previous leaks and pipe material type. While some of these factors are considered in the predictive JANA risk-ranking tool used by the Company to prioritize pipe replacements, the Company is not aware of an accounting methodology that calculates these reductions based on the factors identified by the Commission. In its Order, the Commission even noted that some of the additional information requested by

[19] Washington Gas is currently performing ALD of the PIPES 2 approved project mains and services using car mounted technology and prioritizing the replacements in accordance with the highest emissions rates, where feasible.

[20] Formal Case Nos. 1154, 1175 and 1179, Order No 22003, at 51 subpart J.

the Partial Concurrence "may not be useful since it deals with moving targets such as the location, concentration, volume, and grade of leaks."[21] Requiring Washington Gas to develop its own new and novel methodology, on a very short timeline, in order to consider the actual condition and previous leaks of the pipes actually replaced presents moving targets that would provide little if any benefit to informing program design while likely requiring significant additional resources to track. However, the Company is awaiting new PHMSA regulations that may direct how natural gas companies deploy ALD and upon implementation of the ALD guidelines the Company may use the ALD measured/calculated emissions in the project areas to determine GHG reductions to the extent it is appropriate and probative.

Q. DOES THE COMPANY HAVE AN UPDATED PLAN TO ADDRESS THE REMAINING VINTAGE MATERIALS IN ITS DISTRICT OF COLUMBIA DISTRIBUTION SYSTEM?

A. Yes. As provided in Exhibit WG (A) – 1, the Company has a total of 477 miles of main and 32,167 service segments, including approximately 393 miles of cast iron main, remaining in the District of Columbia. The Company's prioritization of work to retire cast iron main and other facilities will be in accordance with the JANA risk model, with the objective of removing the most risk from the distribution system to enhance safety and reliability while avoiding future leaks. As shown in Exhibit WG (A) - 1, the Company intends to slightly accelerate its

[21] *Id*. at 18 n.126.

service replacement pace, and significantly accelerate its main replacement pace to make greater progress in ensuring safety and reliability.

Q. ARE THERE VINTAGE MAINS THAT CAN BE ABANDONED IN THE DISTRICT OF COLUMBIA WITHOUT REPLACEMENT?

A. The Company has identified approximately 15 miles of cast iron main segments throughout the District without any active services that are being evaluated for potential abandonment. These facilities are included in the JANA risk model. If these mains can be abandoned without adversely impacting the reliability or operations of the Company's distribution system, then they will be removed without replacement as informed by the JANA risk model and the risk-reduced-per-dollar-spent metric.

Q. DO THE DISTRIBUTION INFRASTRUCTURE REPLACEMENTS INCLUDED IN THE COMPANY'S DISTRICT SAFE PLAN IMPROVE PUBLIC SAFETY OR INFRASTRUCTURE RELIABILITY?

A. Yes. All the Company's proposed replacements for District SAFE improve public safety by reducing the potential for future leaks on highly leak-prone assets and installing updated safety features. Notwithstanding the obvious safety benefit of reducing leaks, additional benefits of the District SAFE Plan include the installation of EFVs on service lines and TSVs on meter sets. Further, the Company will continue to utilize new marking technology when installing new pipes and relocate inside meters outside when feasible to

enhance safety on the distribution system. The Company's District SAFE Plan will also improve reliability by upgrading low-pressure systems to medium-pressure systems. This can reduce water infiltration into the pipeline which causes outages and reduces the risk of over pressuring customer house piping, as occurred in the Merrimack Valley incident.

Q. HOW DOES THE COMPANY IDENTIFY THE VINTAGE MATERIALS TO TARGET UNDER THE DISTRICT SAFE PLAN?

A. The Company identifies the materials to be included in the District SAFE plan through the Company's DIMP Plan, which is a required plan under federal law.[22] District SAFE seeks to align regulatory approvals with these requirements and will allow the Company to continue its accelerated replacement activities consistent with federal law and the Company's DIMP Plan.

Consistent with the approach in the prior filings in Formal Case Nos. 1115 and 1154, and as explained in Exhibit WG (A)–1, the Company analyzed the updated leak and maintenance history of its main and service pipes by material type for the period January 2019 to December 2023. The Company's analysis of this data was used to reaffirm the population of the main and service pipes to be replaced in District SAFE.

[22] *See* Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006 § 9, 49 U.S.C. § 60109 (2006); 49 CFR Part 192 Subpart P.

Q. WHAT IMPACT WILL THE DISTRICT SAFE PLAN REPLACEMENTS HAVE ON LEAKS?

A. Over time, the Company's replacement activity will result in a reduction of leaks across the system, and the Company will continue to track the number of gas leaks on its piping system. Although year-to-year variations may arise due to continued aging infrastructure and weather conditions, the leak rate (excluding leaks from third-party excavation damages) for the modern pipe is near zero. Therefore, as more of the system is comprised of modern pipe, the location of leaks will be confined to a smaller number of assets. It is critical to reiterate that the remaining pipe will continue to age and the leaks and associated leak rates on the remaining targeted pipe can be expected to increase until replaced, which is another factor supporting an accelerated rate of replacement. These leak rates will continue to be exacerbated by others working in close proximity to aging piping, particularly cast iron.

Q. IN ADDITION TO SAFETY AND RELIABILITY, WHAT OTHER BENEFITS WILL BE ACHIEVED AS A RESULT OF THE DISTRICT SAFE PLAN?

A. There are several benefits that will be achieved. First, as part of service replacements, inside meters and regulators will be moved outside where feasible, thereby providing the Company with direct access to the meter and regulator without the need for the customer to be present and eliminating the inconvenience of providing access for routine maintenance. Relocating meters

and regulators also allows fire departments and Company personnel to shut off gas to the property from the outside more quickly in the case of an emergency. The costs associated with meter moves are not recovered through the accelerated replacement surcharge but through the normal ratemaking process.

Second, where feasible, the Company will upgrade low-pressure systems to medium pressure. In this process of upgrading low-pressure systems to medium pressure, the Company will not increase revenues by directly connecting the infrastructure replacement to new customers.[23]

Upgrading low-pressure systems will eliminate the required maintenance to pump out and properly dispose of water and other liquids collected in piping system drips. Further, there are environmental benefits associated with this upgrade because it removes the potential for environmental hazards and spills during this required maintenance. This upgrade also eliminates the need for quarterly lab testing of liquids collected and the associated resources to perform this testing, which results in cost savings.

In addition, upgrading low-pressure systems to medium pressure will provide customers with the opportunity to install high-efficiency appliances, such as tankless water heaters, that cannot operate with low-pressure deliveries. Besides the environmental benefits from the improved efficiencies, customers will likely realize cost savings, all else being equal, due to the reduced gas consumption. Another advantage of medium-pressure deliveries

[23] Order No. 17431 at 33.

is the opportunity to replace diesel back-up generators with gas-fired backup generators that may require the higher delivery pressure. Customers will thus be able to enhance the reliability of electric use by having greater access to gas-fired backup generators. Again, as noted above, this activity is not intended to increase revenues by directly connecting the infrastructure replacement to new customers.[24] The benefits I've described here are in addition to the emissions benefits identified in the Plan and discussed by Company Witness Rogers.

VIII. DISTRICT SAFE INVESTMENT STRATEGY

Q. WHAT IS THE COMPANY'S PROPOSED INVESTMENT LEVEL FOR THE THREE YEARS OF DC SAFE?

A. Washington Gas intends to invest $215 million over three (3) years in District SAFE (*i.e.*, March 1, 2025, through December 31, 2027). Details of Washington Gas's proposed expenditures are in Section VI of Exhibit (A) - 1. Based on the Company's current risk assessments, the distribution program budget will be allocated across the District of Columbia projects from the top down utilizing the risk-reduced-per-dollar-spent metric applied across all vintage materials.

Q. IS THE $215 MILLION INVESTMENT SUBJECT TO CHANGE?

A. There may be some small variations year over year for the proposed annual budget; however, the proposed budget creates an upward maximum boundary

[24] *Id.*

of investment dollars that will be included in the rider surcharge each year for cost recovery. The Company anticipates that the annual investment for the programs may vary based upon changes in schedules and priorities due to changing risk profiles, operational conditions and/or opportunities for construction efficiencies. However, the current budget provides strategic direction for allocating District SAFE resources on a long-term basis. Year-to-year project selections will be developed based on both short and long-term considerations and will be presented to the Commission annually for review and approval following the existing process for project list submittals already approved by the Commission. The Commission and all parties should view the Company's annually filed project lists as indicative of its year over year investment targets.

Q. WHAT REPLACEMENTS DOES THE COMPANY BELIEVE IT WILL ACCOMPLISH OVER THE NEXT THREE YEARS UNDER THE PLAN?

A. The Company is currently projecting the following replacements under District SAFE:

Table 4: Projected Replacements under the District SAFE Program

Total Units Replaced/Remediated	CY 2025[25]	CY 2026	CY 2027	Total
Miles of Main	2.2	2.5	7.7	12.4
Services Replaced	1,191	1,515	902	3,608
Services Transferred	39	116	399	554

[25] March 1, 2025, through December 31, 2025

Service Only Replacements	1,036	1,298	278	2,612
Service Replacements with Main	155	217	624	996
Service Transfers with Main	39	116	399	554

This reflects a reduction of 3% of the vintage mains on the system, and 15% of the vintage services-only work. To the extent the final approval in this proceeding reduces the investment level available, the Company will be required to lower the projected replacements accordingly.

Q. WILL THE COMPANY CONTINUE TO REPLACE PIPING THROUGH NORMAL REPLACEMENTS?

A. Yes. The Company routinely performs normal replacement work throughout the year. Normal replacement work includes but is not limited to: non-vintage main relocations/replacement; pressure improvements for reliability; service replacement/relocation; and emergency main replacements. The work can include District SAFE eligible and ineligible mains and service facilities. Additionally, beginning in District SAFE and per the Commission's order, the Company's scattered emergency service replacements performed in response to Grade 1 leaks will also be qualified as normal replacement work.

Q. ARE THERE ANY DRIVERS THAT COULD IMPACT THE COMPANY'S ABILITY TO ACHIEVE ITS REPLACEMENT PROJECTIONS?

A. Yes. The Company's construction budgets are heavily impacted by the District's road permit policies. As shown in the Section V sub-part C-E of the Plan and discussed further below in my testimony, the District has adopted a number of onerous policies in recent years that have dramatically increased the cost and slowed the pace of replacement activities. To the extent the District adopts further measures, these could have a negative impact on the replacement pace and cost that is entirely outside of the Company's control. Similarly, to the extent the District removes some of the barriers that are currently in place, the Company could see greater efficiency and increased cost-effectiveness.

Q. WHAT COORDINATION EFFORTS HAS THE COMPANY TAKEN TO IMPROVE COST-EFFECTIVENESS AND REPLACEMENT TIMING?

A. The Company performs an annual analysis of its current and projected contractor crews and other resources to create yearly resource plans. These plans are revisited throughout the year as necessary. When feasible, Washington Gas has sought to replace eligible main in coordination with DDOT, Potomac Electric Power Company ("PEPCO") and other agencies/entities. These efforts can reduce the impact to customers, allow for the possibility of shared restoration costs, and prevent any leaks caused by construction on a cast iron main. These coordination efforts will continue both in the Company's accelerated replacement programs and its normal business practices to ensure cost and construction efficiencies and customer considerations.

Additionally, throughout PIPES 2, the Company has met with the Commission Staff, PEPCO, DDOT leadership and the Mayor's Office to negotiate some of the restrictions imposed on Washington Gas construction. The Company has presented information on the benefits of less restrictive work conditions, such as no work hour restrictions, increased work zone size and the use of typical traffic control plans. In one example, the extended working hours allowed the Company to utilize 12 crews,[26] increasing the productivity rate by approximately 40% and decreasing what would normally be a 40-week project to a 2-week project to replace over one-half (0.5) mile of main, 38 services, and removing a regulator station. This translated to a reduction in project costs by over 30%. This translates to less impact on the public as a result of fewer overall hours of construction, shorter parking restrictions, fewer steel plates (lessening noise complaints), less time that chain link fencing surrounds the job site, a faster restoration timeframe, safer traveling conditions by reducing the amount of time traffic had to be re-routed, reduced permitting fees, and more flexible hours to accommodate customers that need service replacements. Washington Gas will continue these coordination efforts to serve the customers in the District.[27]

In addition to these meetings, the Company has met with Pepco and Commission Staff, presenting multiple technical conferences on unit cost, normal replacement work, accelerated replacement, and the Company's

[26] Typically, Washington Gas is allowed one (1) crew per three (3) block radius per DDOT.
[27] Formal Case Nos. 1154, 1175, and 1179, Order No. 22003 (June 12, 2024).

management practices.[28,29,30] Washington Gas will continue these coordination efforts with the Mayor, DDOT and other parties to best serve the customers in the District, and looks forward to the Commission facilitating additional discussions.[31]

IX. PROJECT MANAGEMENT PRACTICES

Q. PLEASE EXPLAIN HOW THE COMPANY ESTIMATED PROJECT COSTS UNDER PIPES 2.

A. Under the current PIPES 2 Plan, the Company generated and presented three cost estimates. First, the Company estimated the total cost and total duration of each individual program. Second, the Company estimated the costs for the next three (3) years of the program, which was set by the Commission not to exceed $150 million. In the development of the PIPES 2 three-year tranche, the Company utilized various internal data sources to construct cost estimates, including its Asset Resource Management System ("ARM"), formerly referenced as Work Management Information System ("WMS"), and Powerplant system. Washington Gas extracted direct contractor costs from ARM. Paving, Other Direct Costs, and Allocations are extracted from Powerplant. The Paving and Other Direct costs were calculated as percentages of the contractor charges. Applying the percentages to the ARM average costs results in fully loaded average unit costs for the main and services to be replaced. Main costs were

[28] Formal Case No. 1154, *Technical Conference Report on PROJECTpipes Unit Costs* (May 19, 2021).
[29] Formal Case No. 1154, *Technical Conference Report on PROJECTpipes Program Implementation Plan and Liberty Audit Recommendation* (July 26, 2021).
[30] Formal Case No. 1154, *Technical Conference Report on Washington Gas's Pipe Replacement Activities* (November 22, 2021).
[31] Formal Case Nos. 1154, 1175, and 1179, Order No. 22003 (June 12, 2024).

expressed as cost per foot of main. Service costs were expressed as cost per service. All unit costs were expressed on an individual program basis. These estimates were derived using historic average costs plus inflation from past replacement construction work in the District. Third, the Company created an annual project list with project specific Association for the Advancement of Cost Engineering ("AACE") Class 3 estimates.

Q. DOES THE COMPANY PROPOSE TO FOLLOW THE SAME COST ESTIMATION PROCESS IN ITS DISTRICT SAFE PLAN?

A. Yes.

Q. HAS THE COMPANY IDENTIFIED PARTICULAR COST DRIVERS THAT ACCOUNT FOR VARIANCES IN PROJECT*PIPES*?

A. Yes. The Company participated in a Technical Conference regarding PROJECT*pipes* unit costs in accordance with Order No. 20671 on April 22, 2021. The Company identified the following items driving cost increases in the District: (1) main replacement mix of work, (2) service replacement changes, (3) restrictions on work hours, (4) spoils removal, (5) tree protection, (6) design and oversight, (7) labor costs, (8) paving limits, (9) permitting requirements, and (10) Traffic Control. Since the technical conference, DDOT has continued to impose additional restrictions on the Company.

Q. HOW HAVE DDOT TRAFFIC CONTROL PLAN CHANGES IMPACTED THE COMPANY'S PROCESS?

A. In 2021, traffic control plans ("TCP") were changed to expire within 6 months of their approval date. This has led to multiple renewals and additional permitting and design costs, plus added challenges during active construction when the originally approved TCP is denied on second review. Along with the shortened TCP expiration, DDOT enforced a 1,200 linear foot trench restriction. This requires the Company to complete the final paving restoration prior to the project's completion, breaking the work into multiple phases, increasing restoration costs. Also, in some cases, the Company's underground construction crews had to demobilize from the work zone until paving was completed when they could have been working concurrently.

In 2022, DDOT began restricting the Company's total allowable Traffic Control Plan work zone to 200' in length which included the required traffic control and construction area, limiting the space for the Company to work into near infeasible conditions. The Company met with DDOT to explain this was not feasible and needed at least a minimum of 419' for main installations in order to follow their standards on a 25-mile-per-hour roadway. DDOT decided to only allow for a 300' work site instead. For example, a typical TCP may require 100' for the first taper, and 50' for the buffer zone which prohibits the Company from parking equipment in this area, and another 50' for the end buffer. That only allows the Company 100' in which to park a tool truck, as well as perform the excavation which requires an excavator, dump truck, and sometimes a vacuum excavator. A single service replacement requires a minimum of 127' construction area and 209' when installing main. DDOT also created a limit for the number of pages that can be included in a TCP, increasing the number of TCPs the Company is required to design, and increasing costs.

Most recently, in 2023, DDOT ended the use of construction traffic control plans for paving. Washington Gas is now required to submit a separate TCP for paving and restoration of a project, requiring additional design hours, causing project delays and further increasing costs.

Q. HOW HAVE LABOR CONSTRAINTS IMPACTED THE COMPANY'S ACTIVITIES?

A. The Company continues to experience cost escalations associated with the growing demand for qualified underground contractor crews to perform work on accelerated infrastructure replacement programs as well as the overall effort to coordinate projects with external parties. Also, the Company expects to experience cost increases associated with prevailing wage obligations that will impact District SAFE in the amount of an approximate 10% increase in costs for distribution construction projects, and an approximate 12% increase in paving costs, based on current, ongoing, and expected contract negotiations and renewals with contractors that will perform work in the District.

Q. WHAT OTHER OUTSIDE COST PRESSURES HAS THE COMPANY FACED IN COMPLETING ITS PIPES 2 PLAN THAT IT FORESEES IMPACTING DISTRICT SAFE?

A. Currently, Washington Gas is experiencing cost increases across its operations and in relation to supply chain items and contracted field work. The Company expects that its current cost estimates will be subject to change as the Company executes its projects and gains experience with prevailing marketplace circumstances. The Company's current expectation based on supply chain

experience is that an increase in contract price should be anticipated. The Company has accounted for that margin in the program estimates.

Furthermore, in addition to the increased costs due to the extended amount of time required to complete a single service replacement and main installation, the paving costs have continued to rise. The current restrictions, combined with DDOT inspector final approval, have increased the square footage of paving required for a service replacement or main installation. The outside forces driving the Company's costs have increased labor, design work, duration of work, restoration requirements, and permitting fees, in turn, increasing the overheads and allocations.

Q. WHAT STEPS DID THE COMPANY TAKE TO TRY TO CONTROL COSTS UNDER ITS PIPES 2 PLAN?

A. The Company relied on two key processes to manage construction costs under its PIPES 2 Plan. First, Washington Gas has relied on contractors for pipeline construction and replacement services. Washington Gas has, to date, entered multi-year, alliance-type construction contracts with three diverse vendor pipeline contractors through competitive bidding and negotiated unit pricing (per foot or a lump sum) to obtain the most competitive unit prices in the market from qualified contractors. Each of the unit-based contracts includes very specific per unit prices for various units of work completed as part of a project.

Second, the Company has a multi-level process whereby management personnel review and reject or approve all units necessary and appropriate for each project before payment. Through this multi-level process, Washington Gas's management personnel provide oversight for all work performed on the

Company's system. Company management personnel provide oversight of the pipeline contractors to verify installation of the facilities per required specifications, including contract pricing schedules and definitions. This oversight not only promotes safe, quality installations, but also provides thorough oversight of all proposed field design changes and any associated pay items required to complete the work on each project.

Collectively, these processes work together to ensure that expenditures are necessary and prudent and follow contract pricing.

Q. WHAT ADDITIONAL COST CONTROLS ARE IN PLACE FOR PROJECT*PIPES*?

A. Pursuant to Formal Case No. 1142, Merger Commitment 72, the Company does not recover in the surcharge any replacement/remediation expenditures for completed program work incurred post-Merger Close (Fiscal Year 2019 and beyond) that exceed 120 percent of the rolling two-year annual average program cost (calculated from program years 2017 and 2018) of the per unit and per program material replacement/remediation cost. These "excess costs" for cast iron replacement/remediation costs, "are defined as costs above 120% of the Class 3 estimates for such projects until Washington Gas has sufficient data to establish average costs of cast iron replacements/remediation by pipe diameter.[32]

[32] Formal Case No. 1142*, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.,* Order No. 19396, Appendix A at 26 – 27 (Commitment 72) (June 29, 2018).

Q. HOW DOES THE COMPANY'S COST PER FOOT OF MAIN RETIREMENT COMPARE TO OTHERS IN THE INDUSTRY?

A. It is challenging to compare the work performed in the District to work performed elsewhere, due to the differences in the composition of the geographic area, variations in requirements between jurisdictions, the limited contract resources available, and the challenges posed by various governing bodies. However, Washington Gas completed the main retirements in PIPES 2 for an approximate cost of $6.8 million per mile retired. This is roughly comparable to that of Consolidated Edison in New York, which replaced aging main for approximately $5.0 million per mile retired. 49% of the main replacement work Consolidated Edison accomplished was in Westchester County, a suburb of New York City. In fact, the average main replacement cost in Manhattan, while only accounting for 10% of all replacements, costs an average of **$8.7 million per mile retired**.[33] Furthermore, the Peoples Gas and Coke Co. in Chicago has replaced mains at an average cost of $4.1 million per mile retired in neighborhoods and $5.7 million per mile retired for projects in conjunction with a third-party conflict (*i.e.*, work compelled by others) or to address reliability concerns over the last five years.[34] Therefore, the Company's costs are in line with other utilities working

[33] Case 19-G-0066, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Gas Service* Gas Capital Expenditures Year-End Reports (2019, 2020, 2021, and 2022).

[34] Illinois Docket No. 16-0376, Peoples Gast Light and Coke Company Safety Modernization Program ICC 2023 4th Quarter Report (February 14, 2024), Peoples Gast Light and Coke Company Safety Modernization Program ICC 2022 4th Quarter Report (February 14, 2023), Peoples Gast Light and Coke Company Safety Modernization Program ICC 2021 4th Quarter Report (February 14, 2022), Peoples Gast Light and Coke Company Safety Modernization Program ICC 2020 4th Quarter Report (February 16, 2021), Peoples Gast Light and Coke Company Safety Modernization Program ICC 2019 4th Quarter Report (February 18, 2020).

within particularly dense urban areas, as previously affirmed in the Liberty Management Audit which concluded:

> Our examination of Year 1 and 2 work occurred well after its actual performance, making direct observation of work methods and practices impossible. The descriptions given of them, however, generally accorded with what we would expect of replacement work in dense urban areas. Our direct observations of work methods and practices during Year 4 found them in accord with descriptions we had received during our work addressing Years 1 and 2. We also found them in accord with good utility practice.[35]

Q. IF THE COMPANY SPENDS BELOW THE ANNUAL DISTRICT SAFE BUDGET FOR A PROJECT YEAR, DOES THE COMPANY INTEND TO DEPLOY THE UNUSED FUNDS IN THE FOLLOWING PROGRAM YEAR?

A. Yes. The Company endeavors to complete all accelerated replacement projects prioritized within each program year and allocates the budget accordingly. However, if the Company does experience unused funds, it will carry these funds over to the following District SAFE program year as outlined below.

When the Commission approves an annual project list submitted by the Company, it approves both the proposed work on that list and the associated cost estimates. The Company anticipates that, similar to PIPES 2, District SAFE will encounter instances in which actual costs for units completed may be less than what was estimated, resulting in unused funds. Also, the Company may not be able to complete all projects on a project list in the relevant year due to factors outside of the Company's control which would also result in unused

[35] *Formal Case No. 1115, Final Report Management Audit of PROJECTpipes,* prepared by the Liberty Consulting Group at 129 (April 19, 2019).

funds. Both scenarios, which might result in unused funds, may apply to projects that span multiple years, referred to as "phased projects."

Accordingly, the Company plans to carry forward unused dollars to complete work previously approved by the Commission on a project list or on newly approved projects. Furthermore, if unused dollars continue to remain, the Company will continue to manage District SAFE at a program level and consider additional District SAFE projects that will enhance the safety and improve reliability of its distribution system in the District. This approach is consistent with the goals of accelerating the replacement of targeted higher-risk materials and maximizing the risk reduced per dollar spent.

X. DISTRICT SAFE REPORTING

Q. HOW WILL THE COMMISSION TRACK THE COMPANY'S PROGRESS IN REPLACING PIPE UNDER THE DISTRICT SAFE PLAN?

A. Washington Gas proposes to continue to file all reports consistent with what the Commission has required of the Company to file with respect to its PIPES 2 Plan, and consistent with Merger Commitments in Formal Case No. 1142.[36] The Company will continue to file semi-annual and annual Reconciliation Reports, and associated attachments, in accordance with Order Nos. 20671 and 20773, which are subject to review and comment by the parties in this case, as well as the Quarterly Accelerated Replacement Community Liaison Reports.

[36] Formal Case No. 1142, Order No. 19396, Appendix A at 20, 26, and 28 (Commitments 53, 72, and 74).

XI. CONTINUUM MANAGEMENT AUDIT

Q. WHAT WAS THE SCOPE OF THE CONTINUUM MANAGEMENT AUDIT?

A. The Commission issued Order No. 20671 on December 11, 2020, approving in part the Company's Application for Approval of the PROJECT*pipes* 2 Plan. In the Order, the Commission directed Washington Gas to have an independent management audit conducted to cover the first two (2) years of PROJECT*pipes* 2, to evaluate the Company's performance in implementing PROJECT*pipes* in a manner that increases the District's safety and reliability in a cost-effective manner, which was subsequently expanded in Order No. 21560 on December 16, 2022. Per Commission Order No. 21620, the Company engaged Continuum Consulting Group ("Continuum") to conduct an independent management audit of PROJECT*pipes*.

The scope of the Continuum Audit was to examine three (3) task areas. Those three (3) task areas included: Task 1 to include the PROJECT*pipes* Project Selection and Management; Task 2 to include the Washington Gas Implementation of Liberty Management Recommendations and Program Implementation Plan; and Task 3 to include the review of "excess costs" under Formal Case No. 1142 Merger Commitment No. 72).

Q. HOW EXTENSIVE WAS THE CONTINUUM MANAGEMENT AUDIT?

A. The audit engagement with the Company spanned 6 months and included hundreds of man hours of discussions between Continuum and Company personnel, as well as approximately one hundred seventy-one (171) data requests with sub-parts and responses.

Q. WHAT IS WASHINGTON GAS'S CONCLUSION ON THE CONTINUUM MANAGEMENT AUDIT ("AUDIT REPORT")?

A. The Company generally agrees with the Audit Report's overall findings and recommendations. Washington Gas has made great strides since the prior Audit of PROJECT*pipes* performed by the Liberty Consulting Group, and this is reflected in Continuum's findings. Additionally, Continuum found that "WGL has demonstrated prudence in implementing PROJECT*pipes* 2 projects regarding the reasonableness of actual costs."[37] The Company has consistently successfully incorporated the prior audit findings to improve its program, making this the Company's second successful audit.

Q. DID CONTINUUM MAKE ANY RECOMMENDATIONS IN THE MANAGEMENT AUDIT OF PROJECT*PIPES*?

A. Continuum made 21 recommendations in their Management Audit. Continuum made two (2) recommendations for Task 1, 17 recommendations for Task 2, and two (2) recommendations for Task 3 of the audit. The Company filed a response to each of the 21 recommendations, generally agreeing with the recommendations, and added two (2) additional general comments to the filing with the Commission on January 22, 2024.

Q. DID THE COMMISSION AGREE WITH THE 21 RECOMMENDATIONS MADE BY CONTINUUM?

[37] Formal Case No. 1154, Continuum *Independent Management Audit of PROJECTpipes* 2, page 18 (December 12, 2023).

A. The Commission accepted Continuum's Management Audit, stating "the Commission accepts the Audit findings that WGL completed the projects prudently, with sound engineering judgement, and constructional integrity. We also accept the Audit Report's finding that the work WGL performed reduced the risk, leaks, and improved safety within the District." The Commission provided an addendum to Order No. 22003 containing an Audit Report Summary of which they agreed, or partially agreed, with 19 of the 21 recommendations made by Continuum.[38] Washington Gas is complying with the Commission's recommendations and Audit Report Summary, as provided in Exhibit WG (C) – 1.

XII. RESPONSE TO COMMISSIONER BEVERLY'S PARTIAL CONCURRENCE

Q. PLEASE RESPOND TO COMMISSIONER BEVERLY'S RATE OF REPLACEMENT GRAPH ON PAGE 2 OF HIS CONCURRENCE IN ORDER NOS. 22003 AND 22004.

A. Commissioner Beverly provided a graph of cast and wrought iron mains replaced by percent since 2005. Other companies in the United States are remediating cast iron at a faster rate than Washington Gas, which highlights the necessity for the District SAFE program. The Company is executing the accelerated replacement of cast iron and other aging materials at a rate limited by the Commission-approved surcharge mechanism. Furthermore, in Washington Gas's distribution system, other aging materials have a higher

[38] Formal Case Nos. 1154, 1175, and 1179, Order No. 22003, (June 12, 2024).

relative risk and have an increased likelihood to leak compared to the cast iron main in the District, as shown by the leak rates in Exhibit WG (A) – 1. This means that to remediate the cast iron main, enough funding must be available not only to remediate the cast iron, but also bare steel, vintage mechanically coupled pipe, and unprotected wrapped steel mains that will continue to exhibit a relatively higher risk to effectively avoid future leaks and increase safety.

Q. DO YOU HAVE ANY COMMENTS ON THE RELATIVE AMOUNT OF CAST IRON REMAINING ON WASHINGTON GAS'S SYSTEM?

A. Yes. In 2005, Washington Gas had the 26th highest total miles of cast iron main in its system;[39] and in 2023, Washington Gas had the 12th highest total number of miles of cast iron main remaining in its system.[40,41] Of the 55 companies that had 100 or more miles of cast iron main in 2005, 17 companies have removed all cast iron from their systems, and another 15 have removed 75% or more from their systems. Washington Gas has removed the least by percentage, at 14%. For other utilities, their progress was made possible through supportive regulatory environments and aggressively accelerated funding levels approved by their commissions. For example, Duke Energy, one of the pioneers of the accelerated replacement program, was granted a 15-year program at an original estimated cost of $716 million that was completed in 2015. That is an average

[39] 2005 PHMSA DOT F7.100 Report
[40] 2023 PHMSA DOT F7.100 Report
[41] This analysis assumes that Keyspan Energy Delivery – Boston Gas, Keyspan Energy Delivery – Colonial Lowell, and Keyspan Energy Delivery – Essex Gas from 2005 have merged into Boston Gas Co. in 2023 and therefore the Company is assuming them to be a single Company for this analysis.

of $47.7 million per year ending in 2015.[42] That is nearly double what Washington Gas was approved to spend annually throughout PIPES 1, and nearly as much as Washington Gas was approved to spend on an annual basis in PIPES 2, not accounting for the significant inflationary impacts over the last five years. The same Commission that approved Duke Energy's Accelerated Main Replacement Plan ("AMRP") has also approved Columbia Gas's Infrastructure Replacement Program ("IRP"), which has removed 75% of their cast iron main since 2005.[43] Columbia Gas's current plan in Ohio is on its 16th year of a 30-year plan, and Columbia Gas invested nearly $2.5 *billion* dollars through 2023, or an average of $155.8 million per year.[44,45] This is consistent with other gas utilities that have remaining cast iron main.

Most recently, BGE, which has 913 miles of cast iron remaining in its system, as of 2023,[46] has spent approximately $784.9 million in its Maryland STRIDE Program (2019 – 2023), or approximately $157.0 million per year.[47] Consolidated Edison ("Con Ed") in New York, which has 811 miles of cast iron remaining in its system, has spent approximately $1.8 billion between 2019 and

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[42] Ohio Gas Main Replacement Programs Table, Ohio Public Utilities Commission, Natural gas pipeline safety in Ohio | Public Utilities Commission of Ohio, last visited on July 24, 2024.
[43] 2005 and 2023 PHMSA DOT F7.100 Reports
[44] Ohio Gas Main Replacement Programs Table, Public Utilities Commission of Ohio, Natural gas pipeline safety in Ohio | Public Utilities Commission of Ohio, last visited on July 24, 2024.
[45] Does not include costs for meter move-outs, hazardous service line replacements, risers, automated meter reading devices and other costs.
[46] 2023 PHMSA DOT F7.100 Report.
[47] Maryland Case No. 9468, *In the Matter of the Application of Baltimore Gas and Electric Company for Approval of a New Gas System Strategic Infrastructure Development and Enhancement Plan and Accompanying Cost Recovery Mechanism,* "BGE STRIDE Program and Project Cost Variance Information" (March 23, 2020), "BGE STRIDE Program and Project Cost Variance Information; BGE STRIDE Rate True-Up Information" (March 15, 2021), "Errata to BGE STRIDE Program and Project Cost Variance Information" (April 1, 2022), "BGE STRIDE Program and Cost Variance Information; BGE STRIDE Rate True-Up Information" (March 15, 2023), and "Errata to BGE STRIDE Program and Project Cost Variance Information" (April 3, 2024).

2022, alone, under their safety and reliability surcharge mechanism. This equates to an average $441.3 million per year.[48]

Washington Gas's divergence from the remaining companies when replacing cast iron and other aging mains is not only due to the jurisdictional challenges discussed previously, but disproportionately lower funding between Washington Gas and others. The levels of replacement achieved by others can only be met by Washington Gas through additional funding and coordination with DDOT and other infrastructure stakeholders to negotiate the ever-changing, burdensome restrictions on construction activity in the District of Columbia.

Q. PLEASE RESPOND TO COMMISSIONER BEVERLY'S ANNUAL CAST/WROUGHT IRON MAIN REPLACEMENT (MILES) GRAPH ON PAGE 3 OF HIS CONCURRENCE.

A. The Company notes that there are approximately 40 miles of cast iron remaining in Maryland (less than 1% of pipe), and under 14 miles of cast iron remaining in Virginia (less than 0.5% of pipe). The Company has active accelerated replacement programs in both jurisdictions, each of which includes a cast iron replacement program. However, as in the District, cast iron main elsewhere in the Company's system has a lower historical leak rate than bare steel, unprotected wrapped steel, and vintage mechanical coupled pipe. The

[48] Case 19-G-0066, *Proceeding on Motion of the Commission as to the Rates, Rules and Regulation of Consolidated Edison Company of New York, Inc. for Gas Service,* "Gas Capital Expenditures Year End Report" (February 28, 2020), "Gas Capital Expenditures Year End Report" (March 1, 2021), "Gas Capital Expenditures Year End Report" (March 2, 2022), "Gas Capital Expenditures Year End Report", (February 28, 2023).

Company is currently performing a majority of vintage mechanically coupled steel replacements in both jurisdictions in accordance with the Company's JANA risk model. Both Maryland and Virginia have large populations of vintage mechanically coupled main, unlike the District, and which inform the Company's deployment of resources to remove the most risk from the system to increase the safety and reliability of the current infrastructure in those states. While the graph provided by Commissioner Beverley shows a decrease in the miles of cast iron main replaced annually, the Company has invested resources to remove the most risk from the system, removing bare and unprotected wrapped steel and vintage mechanical coupled wrapped steel, which is not shown on this graph. In fact, the Company has replaced more miles of main annually in PIPES 2 than in PIPES 1.

Q. COMMISSIONER BEVERLY STATES THAT THE COST PER MILE OF MAIN REPLACEMENT IN 2022 WAS $7.8 MILLION AND THE COST PER SERVICE WAS $23,000. IS THIS ACCURATE?

A. No. In 2022, the Company replaced each mile of main, which included replacing/transferring all attached services and their associated costs, for $6.4 million per mile, and each service-only replacement was an average of $22,300.[49] As noted previously in my testimony, DDOT policies are a large cost driver around these average replacement costs. Additionally, the Company is constrained by Merger Commitment No. 72, which allows Washington Gas only to recover 120% of the previous two-year rolling average in the surcharge.

[49] Washington Gas retired 5.2 miles of main in 2022 for $33,439,137 and retired 879 services only replacements for a $19,576,170.

Q. COMMISSIONER BEVERLY STATES THAT WASHINGTON GAS HAS 'BY FAR THE MOST EXPENSIVE COST OF PIPE REPLACEMENT IN MARYLAND,"[50] DO YOU AGREE?

A. No. In the Company's STRIDE 2 Programs, Washington Gas replaced main at an average cost of $2.54 million per mile, while BGE replaced main at a cost of $2.73 million per mile.[51]

Q. COMMISSIONER BEVERLY STATES THAT THE COST PER MILE OF REPLACEMENT IS HIGHER IN THE DISTRICT THAN THE WORK PERFORMED IN MARYLAND. WHY IS THIS?

A. The cost of pipe replacement in the District is greater than the cost in Maryland and Virginia due to the additional jurisdictional constraints imposed on the Company in the District, as discussed previously in my testimony. Washington Gas's master service agreements negotiate the same unit pricing, *i.e.*, cost per service replacement by direct bury, saw cutting, cost per mile of 2" install, etc. However, due to the work restrictions in the District, these unit costs are higher in the District to account for the added cost of these requirements. For example, a standard service replacement in the District takes approximately two and a

[50] Formal Case Nos. 1154, 1175, and 1179, Order No. 22003, *Partial Concurrence of Commissioner Beverly to Order Nos. 22003 & 22004*, paragraph 7 (June 12, 2024).

[51] Maryland Case No. 9468, *In the Matter of the Application of Baltimore Gas and Electric Company for Approval of a New Gas System Strategic Infrastructure Development and Enhancement Plan and Accompanying Cost Recovery Mechanism,* "BGE STRIDE Program and Project Cost Variance Information" (March 23, 2020), "BGE STRIDE Program and Project Cost Variance Information; BGE STRIDE Rate True-Up Information" (March 15, 2021), "Errata to BGE STRIDE Program and Project Cost Variance Information" (April 1, 2022), "BGE STRIDE Program and Cost Variance Information; BGE STRIDE Rate True-Up Information" (March 15, 2023), and "Errata to BGE STRIDE Program and Project Cost Variance Information" (April 3, 2024).

half (2.5) days on average to complete, while a standard service replacement in Maryland or Virginia can be completed in a single working day owing to less onerous time work restrictions, such as additional time needed to set up protection and traffic control, the limited work zone, etc.

The Company's internal accelerated replacement construction practices do not differ between the three jurisdictions. Each jurisdiction utilizes the same design contractor, the same permitting resources, internal qualified construction supervisors to oversee projects and approve the work, and Washington Gas even has a third-party construction contractor that performs work in both Virginia and the District. The cumbersome restrictions imposed by DDOT make work much more difficult, slower, and more costly compared to surrounding areas, which is ultimately reflected in the cost borne by our customers. The Company continues to pursue negotiations to mitigate or eliminate some of these restrictions with DDOT thanks to facilitation by the Commission in accordance with Order No. 22003.

Q. COMMISSIONER BEVERLY STATES THAT WASHINGTON GAS SPENDS MORE ON SERVICES THAN MAINS. WHY IS THIS THE CASE?

A. Washington Gas prioritizes removing the most risk from the system on an annual basis. The Company has many relatively higher-risk services attached to non-eligible main. These services are being prioritized in accordance with the JANA risk model, as discussed by Company Witness Stuber, and these rankings will dictate the dollars spent on main versus service-only replacement work to continue to address the most risk in the District in order to enhance safety and reliability of the system for the benefit of our customers. While

Commissioner Beverly points to BGE's practices, there can be many operational and risk-driving reasons that BGE runs its program differently than Washington Gas. The Company does not have specific information regarding the risk drivers that dictate BGE's spending split between mains and services, however, even if it did, that would not provide a basis for Washington Gas to deviate from the risk prioritization process recommended by JANA.

XIII. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND PROVIDE YOUR RECOMMENDATION TO THE COMMISSION.

A. Washington Gas is seeking Commission approval of its District SAFE Plan and continuation of the accelerated pipe replacement surcharge mechanism, as described in this and other supporting testimony. I have noted in my testimony the Company's accomplishments under its current PIPES 2 Plan. Under its proposed District SAFE Plan, the Company will continue to enhance the safety and reliability of its gas distribution system in the District. Lastly, during the execution of its District SAFE Plan, the Company will continue to inform the Commission of its accelerated replacement efforts by continuing to meet all reporting obligations.

Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?

A. Yes.

EXHIBIT WG (C)-1

CONTINUUM AUDIT RECOMMENDATIONS

1. **RECOMMENDATION 1.1 – COMPLY WITH THE REQUIREMENT TO COMPLETE A VARIANCE ANALYSIS ON ANY PROJECT THAT EXCEEDS FIVE PERCENT (5%) POSITIVE OR NEGATIVE VARIANCE FROM THAT ORIGINAL ESTIMATE AS IS REQUIRED IN ORDER NO. 20313. FORMALLY USE THIS VARIANCE ANALYSIS TO MAKE PROCESS IMPROVEMENTS IN ESTIMATION TO ACTUAL VARIANCE. (SEE RECOMMENDATIONS 2.10: DASHBOARD AUGMENTATION FOR RELATED DISCUSSION OF VARIANCE ANALYSIS)**

   - **WGL INITIAL RESPONSE:** Washington Gas has performed the variance analysis and reporting in full compliance with Order No. 20313 in Year 1 and Year 2 of PIPES 2. The Company will continue to provide variance explanations for any project with plus or minus 5% cost variance in the upcoming annual reconciliation report due March 31, 2024. The Company will continue to use this analysis to improve our project estimates as we have done over the course of PIPES. However, this requirement does not comport with the American Association of Cost Engineering ("AACE") Class 3 estimating accuracy range of minus 20% to plus 30% variance. The Company recommends that this reporting requirement be amended to provide variance reporting of plus or minus 20%, consistent with the AACE Class 3 estimating range.

   - **COMMISSION RESPONSE: ACCEPT:** For Task 1, Audit Report Recommendation 1.1 (Variance Analysis), the commission accepts the recommendation that WGL shall complete a variance analysis on any project that exceeds five percent (5%) positive or negative variance from that original estimate and formally use this analysis to make process improvements in estimation to actual variance.

   - **WGL REPLY COMMENTS:** Washington Gas will continue to file variance analysis for projects that are plus or minus five percent (5%) variance from the AACE Class 3 estimate for the semi-annual and annual reconciliation reporting each year and further formalize the variance analysis in the Program Implementation Plan.

2. **RECOMMENDATION 1.2 – GIVEN THE APPROPRIATE AND CONSERVATIVE APPROACH TAKEN TO ESTIMATING BY WGL, THE DC PSC SHOULD CONSIDER STRUCTURING THE REGULATORY REQUIREMENTS TO OFFER MORE FLEXIBILITY TO WGL TO BACKFILL FOR ADDING WORK IN ANY GIVEN YEAR AS IT BECOMES APPARENT THAT THERE IS SCHEDULE OR CREW SPACE AND SPENDING AVAILABLE IN THAT YEAR.**

   - **WGL INITIAL RESPONSE:** Washington Gas supports allowing additional flexibility to the annual project list beyond the Company's current authorization to change/add two projects at a maximum of $1 million annually per project, in accordance with Order No. 17500, to more efficiently and effectively manage the program.

- **COMMISSION RESPONSE: REJECT:** The Commission rejects Task 1, Audit Report Recommendation 1.2 (Project Addition Flexibility) to increase flexibility for WGL to backfill work.

- **WGL REPLY COMMENTS:** Washington Gas is requesting the Commission reconsider and approve the Auditor's recommendation. Due to the schedule uncertainty that can occur related to obtaining permits, customer scheduling, or other non-gas related work intersecting planned gas replacement projects the Company should be allowed to add projects without limitations that meet the requirements set forth in Order No. 17431, if Washington Gas is completing units on the current approved project list below the original estimate. This would allow the Company to remove additional risk without increasing the annual approved expenditure.

3. **RECOMMENDATION 2.1 – RETAIN PROGRAM 1 AS A SEPARATE PROGRAM AND THE DC PSC SHOULD CONSIDER ALTERING THE COST RECOVERY TO TAKE INTO CONSIDERATION THE CLASSIFICATION OF ANY OCCURRING LEAK THAT IS PART OF THE PROGRAM THAT YEAR AND THE LEVEL OF RISK TO ASSIGN THE SEVERITY.**

- **WGL INITIAL RESPONSE:** The Company agrees that service only replacements should remain a separate program under PROJECTpipes, consistent with the Commission's approval in Order Nos. 174311 and 20671

  However, Washington Gas does not agree with Continuum's proposal to remove scattered services replaced due to a Grade 1 leak from the PIPES 2 program. Continuum suggested that emergency work should be included under "normal replacement" unless the service is part of the planned program for the year. The Company designs each tranche of its PROJECT*pipes* program to include the replacement of an average quantity of "scattered" services annually. Although the exact service addresses are not identified on the annual project list, they are still presented with an estimated unit replacement target and corresponding cost estimate on the annual project list which is reviewed and approved by the Commission. Note, these services also meet the eligibility requirements set forth in Order No. 17431, paragraph 68, specifically subpart (d) and are a part of the entire population put forth for replacement in PROJECT*pipes* since the program's inception.

  This process was discussed and agreed upon by Washington Gas, the Office of the People's Counsel for the District of Columbia ("OPC"), and the Apartment and Office Building Association of Metropolitan Washington ("AOBA") in Formal Case No. 1115 and upheld by the Commission in Order No. 17789. Under this requirement, Washington Gas must track scattered service replacements by individual unique Work Request number which are generated based upon field observations/activities and reconcile them annually.

[1] Formal Case No. 1093*, In the Matter of the Investigation into the Reasonableness of Washington Gas Light Company's Existing Rates and Charges for Gas Service,* and Formal Case 1115, *Application of Washington Gas Ligny Company for Approval of a Revised Accelerated Pipe Replacement Program,* Order No. 17431 (March 31, 2014).

This methodology and corresponding reporting requirements should be upheld for scattered service replacements. The PIPES program allows Washington Gas to replace high-risk leaking services to further accelerate the removal of all eligible services. If the Company repairs a leaking service rather than replacing it, there is the potential for repeat call outs causing cost inefficiencies due to making multiple visits and a negative customer experience. By completing a service replacement, the Company is therefore enhancing safety and improving reliability by preventing a future leak, decreasing the impact to the customer, and avoiding the need for future operations and maintenance expenses.

Additionally, while the Company is currently utilizing a fully probabilistic model to prioritize main and service replacements, it predicts the risk and potential of future leaks. This model, while an industry best practice, does not supersede direct observations of the pipe condition or an active leak which may indicate that the pipe is in current need of full remediation via replacement. The Commission has determined that "if a high-risk pipe is identified for replacement (based on risk assessment criteria), it can be accelerated for faster replacement and will no longer be considered normal replacement. We took this position because we want high risk pipes to be replaced proactively regardless of whether they were originally slated for normal replacement or not and we have given WGL the flexibility to move mains and services that would otherwise be 'normal replacement' or 'AOP-related projects' into the APRP bucket if they are pipes that meet the APRP criteria."

The existing and approved practice promotes the accelerated replacement of relatively high-risk, PIPES-eligible infrastructure regardless of whether the service replacement was driven by field observations, a leak, or the Company's risk-based modeling tool.

- **COMMISSION RESPONSE: ACCEPT:** The Commission agrees with Recommendation 2.1 to retain Program 1 (Scattered Services) as a separate program, but to remove all emergency work from eligibility even when the material replaced would be otherwise qualify.

- **WGL REPLY COMMENTS:** Washington Gas will remove scattered service replacements performed as emergency work from the Company's accelerated replacement program in Formal Case No. 1179, per the Auditor recommendation.

4. **RECOMMENDATION 2.2 – WGL SHOULD TAKE ONE OF THREE ACTIONS RELATIVE TO PROGRAM 1 REPLACEMENT PACE: 1) REVISE THE ESTIMATED SERVICES THAT CAN BE REPLACED IN THIS PROGRAM BY THE END OF THE CURRENTLY ANTICIPATED 15-YEAR PERIOD; 2) REVISE THE FORECASTED END DATE OF THE PROGRAM OF THIS PROGRAM GIVEN THE CURRENT PACE; 3) PROPOSE A SPECIFIC MITIGATION PLAN WITH MILESTONES AND SPECIFIC ACTIONS THAT WILL BE TAKEN TO COMPLETE THIS PROGRAM IN ITS ORIGINAL 15 YEAR PLANNED LIFE. (SEE RECOMMENDATION 2.11: LIFE-OF-PLAN FOR ADDITIONAL LIFE-OF-PLAN DESCRIPTIONS.)**

- **WGL INITIAL RESPONSE:** The Company will provide an updated accelerated replacement plan Plan that will include an update to the estimated completion duration for all programs and an update to the remaining units in each program. The Company planned to provide this information during the litigation of PROJECT*pipes* in Formal Case No. 1175.

- **COMMISSION RESPONSE: ACCEPT:** With respect to Recommendation 2.2 (Service-Life-of-Plan), of the three options presented (revise the estimated service that can be replaced, revise the forecasted end date; or propose a specific mitigation plan), WGL proposed to update completion dates for all programs consistent with Option 1. Although we are moving away from a program that contemplates the complete replacement of all high-risk materials, we believe that there is still merit in an ongoing evaluation of the Company's performance. WGL's updated Application must also consider future electrification programs in the District.

- **WGL REPLY COMMENTS:** Washington Gas will provide an updated forecast for the District SAFE program, including life-of-plan in Formal Case No. 1179 in accordance with Order No. 22003.

5. RECOMMENDATION 2.3 – UTILIZE A FOCUSED PROGRAM AND RISK RANKING METHODOLOGY TO ELIMINATE SMALL-DIAMETER (8" OR LESS) CI MAIN AS SUGGESTED IN THE 2019 LIBERTY AUDIT.

- **WGL INITIAL RESPONSE:** The methodology used to identify on macro level proposed programs in PIPES is based on the Distribution Integrity Management Program ("DIMP") analysis and leak rates. Individual project prioritization is primarily done through risk modeling. Since all diameter of cast iron is evaluated on an annual basis via risk modeling, the risk results will dictate which specific facilities should be replaced. The Company recently transitioned to a fully probabilistic risk model, identified by the Pipeline and Hazardous Materials Safety Administration ("PHMSA") as an industry best practice, and will use this model to continue to prioritize projects for replacement. Furthermore, Washington Gas utilizes a risk reduced per dollar metric which results in optimizing the amount of risk removed from the District's distribution system in that plan year. This metric considers both the cost and risk-reduction, thus eliminating the need for a separate program for a diameter specific consideration.

- **COMMISSION RESPONSE: PARTIALLY ACCEPT:** The Commission accepts in part Recommendation 2.3 (Small-Diameter Main Focus). WGL's DIMP analysis and risk-modeling evaluation includes consideration of the risk from small diameter pipe along with the attempt to maximize total risk removed through the Risk Reduced per Dollar Spent ("RRDS") metric. WGL claims that the Company does not need to utilize a separate program specifically for a small diameter main; however, the Commission believes more information is needed on the operation of WGL's JANA risk model and how it evaluates both small diameter and other types of main. The recommendation otherwise reiterates the 2019 LMA recommendation. The Audit Report notes that, at a certain point, the RRDS6 metric will be similar for many programs, including both large and small diameter mains, and at that point WGL will need to prioritize small diameter mains. The Commission previously elected not to implement this

Recommendation from PIPES 1 in favor of the RRDS approach. The Commission believes there is value in a tiebreaker or sub-prioritization as recommended by Continuum as many projects have had very similar RRDS scores, but the Commission does not believe a separate program is required at this time.

- **WGL REPLY COMMENTS:** Washington Gas will utilize the JANA risk model to identify projects based on the risk reduced per dollar metric. In the event that the risk reduced per dollar is the same for one or more projects, their prioritization will be given to the replacement of smaller diameter pipe. This enhanced process will be documented in the Company's Program Implementation Plan.

6. **RECOMMENDATION 2.4 – APPLY EARNED VALUE ANALYSIS (EVA) TECHNIQUES, FOR THE ENTIRETY OF THE ACCELERATED MAIN REPLACEMENT PROGRAM, TO ESTABLISH SCHEDULE AND BUDGET PERFORMANCE ON THE ENTIRETY OF THE ACCELERATED MAIN REPLACEMENT PROGRAM AND REPORT INTERNALLY TO SENIOR EXECUTIVE(S) (VP OF CONSTRUCTION AND/OR ARP EXECUTIVE GOVERNANCE COMMITTEE) QUARTERLY TO MAKE A COURSE CORRECTION AS NECESSARY. (SEE RECOMMENDATION 2.8: PROJECT EVA, RESOURCE LOADED, & INTEGRATED SCHEDULE FOR RELATED RECOMMENDATION.)**

   - **WGL INITIAL RESPONSE:** Washington Gas currently performs earned value reporting at the program level on main replacement programs. However, in light of the recommendation made by Continuum, the Company will evaluate how to enhance the current EVA for main replacement programs and will present the outcome within 6 months of the approval of a an accelerated replacement program. Based on the outcome of this evaluation, the Company will add appropriate tracking and/or management process into the Program Implementation Plan ("PIP").

   - **COMMISSION RESPONSE: ACCEPT:** The Commission accepts Recommendation 2.4 (Earned Value Analysis Program) to allow the EVA techniques to be applied throughout the course of the accelerated mains replacement program; to establish a schedule and budget performance on the entirety of the accelerated mains replacement program; and report quarterly to senior executives, allowing for course corrections as necessary. WGL indicated that the Company already performed an EVA reporting at the program level, and they plan to improve reporting and will submit a presentation of improvements within 6 months of approval of an updated Application and PIP updates. Because of the PIPES 2 extension, and the evaluation period for a new Application filing, the Commission directs the Company to update the EVA implementation as part of this and any future PIPES plans.

   - **WGL REPLY COMMENTS:** Washington Gas will seek to enhance its current EVA methodology relative to existing EVA reporting at the program level. The Company's EVA implementation will be documented in the Program Implementation Plan and submitted in the second quarter of 2026.

7. **RECOMMENDATION 2.5 – ENSURE THAT A RESOURCE-LOADED SCHEDULE, THAT IS FULLY INTEGRATED ACROSS PLANNING, BUDGETING, ENGINEERING, DESIGN, PERMITTING, CONSTRUCTION, AND CLOSE OUT, IS DEVELOPED FOR**

THE ENTIRETY OF THE ACCELERATED MAIN REPLACEMENT PROGRAM AND UPDATED QUARTERLY AT A MINIMUM TO MONITOR THE PROGRESS AND ACCURACY OF THE SCHEDULE AND RESOURCE FORECAST. REPORT INTERNALLY TO SENIOR EXECUTIVE(S) (VP OF CONSTRUCTION AND/OR ARP EXECUTIVE GOVERNANCE COMMITTEE) QUARTERLY TO MAKE COURSE CORRECTION AS NECESSARY. THE RESOURCE-LOADED AND INTEGRATED SCHEDULE SHOULD ADDRESS THE FOLLOWING COMPONENTS, ACTIVITIES, AND FRAMEWORK: (SEE RECOMMENDATION 2.8: PROJECT EVA, RESOURCE LOADED, & INTEGRATED SCHEDULE FOR RELATED RECOMMENDATION.)

- **WGL INITIAL RESPONSE:** The Company's Engineering department maintains a Project Design and Authorization Tracking workbook that was implemented in 2023. The engineers meet weekly with the Company's design contractor to track a project from inception through design authorization.

  For post-design authorization tracking, the Project Management team created an Integrated Master Schedule ("IMS") in 2023 utilized to track individual PIPES projects from design finalization through the BCA closure. The Project Management team and Construction meet regularly with stakeholders and contractors to discuss planning, status, execution, progress, priorities, and risk/impediments and identify and coordinate potential project restoration. This includes bi-weekly Project Management meetings, contractor meetings, permitting meetings, and project close-out meetings.

  This process allows the Company to monitor progress and the accuracy of the schedule and quickly determine project delays and/or milestones that are at risk. In addition to the IMS, Construction maintains a DC Project workbook that it uses to document weekly updates with contractors including weekly comments on project performance and challenges as well as current contractor crew resources deployed.

  These tracking mechanisms are used in concert to inform the annual PIPES project list and schedule planning with remaining work identified on carryover projects, taking into consideration permit status, schedule, construction resources, and productivity. These are all used to create the annual project list by updating resource plans, schedule, and staffing required to execute the work.

  Finally, the Company's Property Accounting team creates monthly BCA Project Variance reports that show estimated pay items in individual Class 3 estimates vs. actual pay items cost-to-date. The combined processes above were implemented in 2023 and meet the requirements set by Continuum's Recommendation 2.5 and will continue to be used on a project level to track design variances, schedule variances, and cost variances. Additionally in 2024, the Project Management teams will utilize the reporting currently completed by the Engineering Department to inform the integrated master schedule to track the life of a project from concept to BCA close. The Company will also supplement its executive reporting to include a dashboard that captures these activities by January 2025.

- **COMMISSION RESPONSE: ACCEPT:** The Commission accepts the Audit Report's Recommendation 2.5 (Integrated & Resource Loaded Schedule Program) to require WGL to develop a resource-loaded schedule that is fully integrated across planning, budgeting, engineering, design, permitting, construction, and close out, for the

entirety of the accelerated mains replacement program, and updated quarterly to demonstrate the progress and accuracy of the schedule and resource forecast. The updated processes shall contain a master schedule, as OPC requests, with all the components of an integrated schedule recommended by the Audit Report. We believe fully integrating the design, budgeting, and planning process with the construction process will not only increase reporting visibility but will provide a complete view of the Company's plans and progress. The resource loaded integrated schedule shall contain following:

a. Components:
   i. Start dates, end dates, durations, remaining duration.
   ii. Total quantities, remaining quantities.
   iii. Resources.

b. Activities:
   i. Planning activities.
   ii. Budgeting activities.
   iii. Estimating activity.
   iv. Design activities.
   v. Contractor work distribution process as an activity.
   vi. Permitting activity.
   vii. Cover construction including various parts such as paving (currently included in annual project list).
   viii. Close out activities.

c. Framework:
   i. Cost-loaded schedule.
   ii. Labor loaded schedule.
   iii. Program baseline schedule.
   iv. Project by project breakdown.

- **WGL REPLY COMMENTS:** The Company's integrated schedule will be enhanced and be documented in the Program Implementation Plan and submitted in the second quarter of 2026.

8. RECOMMENDATION 2.6 – BUILD A REQUIREMENT OF ACCOUNTABILITY INTO THE COST ESTIMATING AND PROJECT MANAGEMENT FUNCTIONS BY REQUIRING THE PROJECT MANAGER TO DEVELOP AND/OR SIGN OFF ON THE COST ESTIMATE BEFORE IT IS SUBMITTED TO THE CONSTRUCTION MANAGER FOR APPROVAL.

- **WGL INITIAL RESPONSE:** Washington Gas's AACE Class 3 estimating process currently is initiated by engineering and reviewed and revised as necessary by construction management prior to approval. Construction is tasked with executing the work based on the estimate for the project. However, in its annual "Lessons Learned" activity, the Company will continue to evaluate the current process to identify if any process improvements are needed and if the Project Management Department's sign-off prior to project authorization needs to be incorporated into the

process. As is the Company's continuous improvement practice, any revision to a process will be formalized in a process map and included in the Company's revised Program Implementation Plan, if implemented.

- **COMMISSION RESPONSE: ACCEPT:** Audit Report Recommendation 2.6 (Accountability for Cost Estimates) recommends development of a requirement of accountability into the cost estimate and project management function, which will require the project manager to develop and/or sign off on the cost estimate before it is submitted to the Construction Manager for approval. WGL indicates that the Company will consider whether Project Management department sign off should be incorporated into the process. The Commission accepts this recommendation and directs this measure to be included in the new/updated Application.

- **WGL REPLY COMMENTS:** Washington Gas will update its process to require the project manager to sign off. This process will be documented in the Company's updated Program Implementation Plan and submitted in the second quarter of 2025.

9. RECOMMENDATION 2.7 – HAVE THE PMO GO THROUGH THE PROCESS OF STRATEGIC PLANNING EVERY TWO TO THREE YEARS TO ALIGN THEIR PLAN AND RESOURCES TO AN OVERARCHING CONSTRUCTION STRATEGY AND CORPORATE STRATEGY. THE VP OF CONSTRUCTION AND/OR ARP EXECUTIVE GOVERNANCE COMMITTEE IS RESPONSIBLE FOR APPROVING THIS PLAN OR SENDING IT BACK FOR REFINEMENT WHEN PRESENTED.

- **WGL INITIAL RESPONSE:** Washington Gas currently designs its program plan in five (5) year tranches. This long-range strategic plan considers available and needed resources to execute the PIPES program. Additionally, this long-range strategic plan aligns with the Corporate Strategy to provide a safe and reliable service to its customers by accelerating the replacement of higher-risk pipe based on factors identified in the Company's Distribution Integrity Management Program. The proposed PIPES plan is presented to the Company's senior executive leadership for refinement and alignment with the Company's long-term strategic plan.

  Once a PIPES plan is approved by the Commission, the Company performs monthly and annual reviews of its resource needs.

- **COMMISSION RESPONSE: ACCEPT:** Audit Report Recommendation ("ARP") 2.7 (PMO Strategic Planning) suggests that the PMO must go through the process of strategic planning every two to three years to align their plans and resources to an overarching construction and corporate strategies. The VP of Construction and/or ARP Executive Governance Committee is responsible for approving this plan or sending it back for refinement when presented. WGL states that the Company works in five-year tranches for planning purposes, and that this long-range plan considers both available and needed resources for the PIPES programs. The plan is vetted by the Company's senior executive leadership for alignment with the Company's long-term strategic plans. The Commission accepts the Audit Report recommendation of shortening the strategic plan, and directs that the new/updated Application provide for a three-year process to better align with the District's climate goals.

- **WGL REPLY COMMENTS:** The Company will complete these strategic planning efforts in conjunction with the revised accelerated replacement program application in Formal Case No. 1179 and any future three-year plan amendments.

10. RECOMMENDATION 2.8 – APPLY EARNED VALUE ANALYSIS (EVA) TECHNIQUES, FOR A SUBSET OF ACCELERATED MAIN REPLACEMENT PROJECTS, TO ESTABLISH SCHEDULE AND BUDGET PERFORMANCE ON THESE PROJECTS. BUILD A RESOURCE-LOADED AND FULLY INTEGRATED SCHEDULE FOR A SUBSET OF ACCELERATED MAIN REPLACEMENT PROJECTS AS PART OF THE PMO PHILOSOPHY. (SEE RECOMMENDATION 2.4: EVA PROGRAM, AND RECOMMENDATION 2.5: INTEGRATED & RESOURCE LOADED SCHEDULE PROGRAM FOR RELATED RECOMMENDATIONS.)

- **WGL INITIAL RESPONSE:** See the Company's response to Recommendations 2.4 and 2.5.

- **COMMISSION RESPONSE: ACCEPT:** For Audit Report Recommendation 2.8 (Project EVA, Resource Loaded Integrated Schedule), the Commission accepts the recommendation that WGL is to apply EVA techniques to a subset of accelerated mains replacement projects in order to establish the schedule and budget performances. The Audit Report recommends building resource-loaded and fully integrated schedule as part of the PMO philosophy. The new/update plan shall utilize the same resource-loaded integrated schedule noted in Recommendation 2.5 for analysis.

- **WGL REPLY COMMENTS:** See the Company's responses to Recommendations 2.4 and 2.5.

11. RECOMMENDATION 2.9 – REVERT TO THE MORE ROBUST AND DETAILED REPORTING ASSOCIATED WITH THE RECONCILIATION REPORTS PREPARED AS PART OF PROJECTPIPES 1 AND INCLUDE THE SAME PRESENTATION FORMAT AND DATA SET EVERY YEAR FOR HISTORICAL COMPARISON PURPOSES.

- **WGL INITIAL RESPONSE:** The Company enhanced the tracking of projects during PIPES 2 versus PIPES 1. This enhanced tracking included maintaining a single project list, rather than multiple lists that are worked concurrently as was the process in the PIPES 1 program. Unlike PIPES 1, the Company brings a non-Closed BCA from a prior list onto the next year's project list to ensure that the project is adequately tracked from the concept to closeout phase. Also, the historical performance is readily available by looking at the Company's previously filed annual reconciliation report.

  Additionally, the Company has made changes to the reconciliation report format; however, Washington Gas does continue to provide the same information as requested and provided in the PIPES 1 program, as well as the added requirements in accordance with Order No. 20671, as shown below:

Reporting Metric	PIPES 1 Reconciliation	PIPES 2 Reconciliation

Annual Summary (BCAs, Cost, Miles of Main, Services)	Cover Letter	Cover Letter
Cost Breakout - Direct, Allocation, D&D, Total	Cover Letter	Cover Letter
Class 3 Performance	Cover Letter	MC 72 Filing and Attachment B
Annual Summary by Program	Attachment A	Cover Letter
Project Estimates	Attachment A	Attachment A
Project Actuals	Attachment B	Attachment A
Variance Reporting	Attachment C	Attachment B
LP - MP Replacements	Attachment D	Attachment D
Program 10 Summary	n/a	Cover Letter + Attachment A
Non-Program 10 Summary	n/a	Attachment C

- **COMMISSION RESPONSE: PARTIALLY ACCEPT:** The Commission partially accepts Audit Report Recommendation 2.9 (Standard Reconciliation Reporting), which requires WGL to provide more robust and detailed reporting associated with the reconciliation reports prepared as part of PIPES 1. The ability to accurately compare the performance each year to prior years is important in evaluating progress on any pipe replacement program. To that end, in the new/updated Application, WGL should maintain the presentation format and data set each year. Additionally, although WGL notes that the historical data is available in previous filings, we believe it would be an easier comparison of the data and to track progress for any PIPES program if the Company re-submitted a consolidated report on all PIPES 1 and PIPES 2 projects in a single format.

- **WGL REPLY COMMENTS:** The Company will include its previous Table 1, Table 2 of the cover letter, and Attachment A from its Year 6 Annual Reconciliation filing[2] in future annual reports. Table 1 will include the current actuals as well as prior calendar years in the approved plan, with the number of BCAs each year, the dollars spent, the miles of main installed and retired and the affected services. Table 2 will include the annual expenditures for the current and prior years in the approved plan (*i.e.* direct, allocations, and design and development costs). Finally, Attachment A will include each project year at a glance, including the number of BCAs by sub-program, the estimated and actual scopes and cost, and the count of BCAs by project status.

12. RECOMMENDATION 2.10 – AUGMENT THE EXISTING PROJECTPIPES CURRENT PROGRAM (TYPICALLY 3-5 YEARS IN LENGTH) DASHBOARD IN THREE WAYS: (SEE RECOMMENDATIONS 1.1: VARIANCE ANALYSIS FOR RELATED DISCUSSION OF VARIANCE ANALYSIS).

- **WGL INITIAL RESPONSE:** The Company's Accelerated Replacement Program ("ARP") dashboards currently include graphs and metrics showing the actual performance versus the DC 3-year plan as well as the cumulative annual project list proposals. A second table also provides the year-to-date performance by program.

[2] Formal Case Nos. 1115 and 1154, *Washington Gas's Completed Projects Reconciliation Report* (March 31, 2021).

Washington Gas will include a narrative describing the pace of the program regarding the expected completion success.

The Company tracks and reports to Senior Executives the anticipated units to be completed on a monthly basis. Construction Program Strategy and Management Department ("CPSM"), referenced herein as "PMO" by Continuum, will continue to monitor the cumulative year-to-date units completed and engage with Project Management and Construction to determine if any corrective actions are warranted. Any resultant variance will be presented in the ARP Governance Meeting and to the Executive Governance Committee team upon approval of a PIPES 2 extension or District SAFE Plan.

- **COMMISSION RESPONSE: ACCEPT:** Audit Report Recommendation 2.10 (Dashboard Augmentation) proposes augmenting the existing PROJECTpipes program dashboard to include the following requirements: (a) Compare the total program units and costs plan to year-over-year and year-to-date actual performance, and provide a short (1-3 sentence) narrative describing if the entire program is on pace for successful completion; (b) When a monthly variance exceeds 10%, or an accumulated year-to-date variance exceeds 10%, a formal root cause analysis should be conducted to establish the source and cause(s) of the variance; and (c) When a monthly variance exceeds 10%, or an accumulated year-to-date variance exceeds 10%, a formal mitigation plan should be submitted to the VP of Construction and/or ARP Executive Governance Committee for approval and implementation. WGL states that it uses the dashboard to update senior executives with metrics and graphs of actual performance (versus a 3-year plan) on a monthly basis, and to track year-to-date units, project management, and construction work in order to determine if corrective actions are necessary. Although WGL maintains a robust year-to-date reporting infrastructure, the year-over-year and program total reporting is lacking and should be enhanced to ensure that the total program remains on course. Therefore, for the new/updated plan, the Commission accepts the recommendation to add year-over-year and sum-of-program reporting requirements to ensure the overall replacement of high-risk pipes if the District continues on schedule, and that WGL's program remains on track in support of improved safety, reliability, and the District's climate goals.

- **WGL REPLY COMMENTS:** Washington Gas will implement these recommendations in its internal monthly reporting. The requirements will be included in the Company's Program Implementation Plan.

13. RECOMMENDATION 2.11 – REPORT ANNUALLY TO THE DC PSC, THROUGH A NEW SECTION IN THE PIP, WHERE PERFORMANCE TO MEET LIFE-OF-PLAN EXPECTATIONS IS DESCRIBED IN THREE WAYS. (SEE RECOMMENDATION 2.2: SERVICE LIFE-OF-PLAN FOR ADDITIONAL LIFE-OF-PLAN DESCRIPTIONS.)

- **WGL INITIAL RESPONSE:** The PROJECT*pipes* program enhances safety and improves reliability of the Company's distribution system while reducing greenhouse gas ("GHG") emissions.

  Replacing vintage pipes with high GHG emission factors with more modern materials with lower GHG emission factors reduces Scope 1 emissions related to the delivery

of natural gas. According to the Environmental Protection Agency ("EPA"), emissions factors relating to cast iron main and unprotected steel are approximately 14.5 and 18.9 times greater respectively than the polyethylene pipe that is being used to replace them.

As documented at each PIPES renewal filing with the Commission, the replacement of pipe throughout PROJECT*pipes* has reduced GHGs released by an estimated cumulative reduction total of 23,726 metric tons of carbon dioxide (or CO2 equivalent) through September 2022. Similar "Life of Plan" emissions data is also already incorporated into "Washington Gas Light Company's Annual GHG Emissions Report" that the Company files with the Commission. Within the report, emissions from Company infrastructure shown in the line items titled "Distribution Mains" and "Distribution Services" accounted for approximately 83% of the Company's Scope 1 emissions in 2022. Ongoing reductions in emissions from main and services are almost entirely attributable to the pipeline replacement activity carried out through the PROJECT*pipes* program.

Reductions from these replacement activities are also an important element of the Company's long-term Climate Business Plan ("CBP"). The CBP was developed based on existing laws and regulations and in recognition of the Commission's collaboratively established MEDSIS Vision and Guiding Principles that reflect Washington Gas's role of providing essential safe, reliable, and affordable energy to its customers.

While PROJECT*pipes*' primary purpose is to enhance safety and improve reliability, its emission reduction benefits are significant and reflect "ready now" actions that immediately reduce the cumulative impact of Scope 1 greenhouse gas emissions.

Furthermore, the Company creates a life-of-plan for the units in each program proposed on the 5-year tranche of the PIPES program. This includes the estimated annual miles of main and number of services by program. The dynamic nature of the risk profiles prioritization does not allow for a reliable prediction of the exact main, including size, material, and location and specific services to be completed year over year for the life of the program. Moreover, the Company is unable to predict the financial landscape of the future, *i.e.,* the Covid-19 Pandemic, high inflation rates, supply chain disruptions, etc. While the Company can employ a standard inflation rate, the actual external factors that affect construction costs including jurisdictional requirements and material costs cannot be known or quantified with any real certainty. Considering these items, the Company submits an application for its PIPES program in 5-year increments and further refines on an annual basis in the annual project list filings.

- **COMMISSION RESPONSE: ACCEPT:** The Commission accepts Audit Report Recommendation 2.11 (Life-of-Plan Reporting; see also Recommendation 2.2), which requires annual performance reports to meet Life-of-Plan expectations. The reporting shall include the following: (a) Compare the Life-of-Plan expectation for units to year-over-year actual performance, and provide a short (1-3 sentence)

narrative describing if the Life-of-Plan is on pace for successful completion; (b) When an annual variance against Life-of-Plan expectations exceeds 10%, a formal root cause analysis should be conducted to establish the source and cause(s) of the variance; and (c) When an annual variance against Life-of-Plan expectations exceeds 10%, a formal mitigation plan should be submitted to the VP of Construction and/or ARP Executive Governance Committee for approval and implementation. WGL asserts replacing pipe throughout the District has reduced risk and GHG emissions, by the Company's calculations a cumulative 23,726 metric tons of CO2 equivalent to date.

WGL also asserts the GHG performance metrics are already incorporated in filings in Formal Case 1162. The Company argues that the dynamic nature of risk profile prioritization does not allow for reliable predictions of the exact mains to be replaced (including size, material, location, or specific services), and thus year over year comparisons are not possible. The Company argues this complexity is further exacerbated by the difficulty to predict events such as rapid inflation or the COVID-19 pandemic. OPC argues the Audit Report's re-defining of a new normal for WGL lowers the standards for evaluating the Company's performance. OPC also expresses concerns on the challenges of DC undergrounding work, as well as concerns on District ratepayers having to bear the cost for acceleration as the District transitions toward electrification. The Commission notes that replacements play a significant role in ensuring the safety and reliability of the gas distribution system in the District. We believe that the pipe replacements completed through the PROJECTpipes program have significantly aided in the reduction of gas leaks, and in the maintenance of a safe and reliable gas system in the District. Keeping this in mind, we believe that the new/updated plan will need to establish a new baseline to help reflect the changing environment in the District, including the District's climate goals and ongoing electrification efforts. Although WGL submits robust annual reports on replacements, costs and project status, those reports provide little information on the overall progress of PROJECTpipes against the long-term targets for pipe replacement. The Commission believes that accepting this recommendation and requiring WGL to include it in the new/updated plan will produce better Life-of-Plan reporting and analysis to ensure that PROJECTpipes remains on track as a cohesive plan to accomplish these objectives.

- **WGL REPLY COMMENTS:** The Company will include the Auditor Recommendation 2.11 sub-parts (a) and (b) in the annual reports in Formal Case No. 1179. The Auditor Recommendation 2.11 sub-part (c) will be discussed with the ARP Executive Governance Committee. Additionally, see the Company's response to Recommendation 2.2.

14. RECOMMENDATION 2.12 – COVER PAGE PLUS THREE PAGES FOR EACH APPROVED PROGRAM (CURRENTLY SIX APPROVED PROGRAMS) - CURRENT YEAR, CURRENT YEAR IN PROJECTPIPES, CURRENT YEAR IN LIFE-OF-PLAN – LIST MEASURES/OBJECTIVES FROM THE TABLE INCLUDING: (SEE RECOMMENDATION 2.2: SERVICES LIFE-OF-PLAN, RECOMMENDATION 2.4: EVA PROGRAM, AND RECOMMENDATION 2.11: LIFE-OF-PLAN FOR RELATED COMMENTARY).

- **INITIAL WGL RESPONSE:** See the Company's response to Recommendations 2.4, and 2.5.

  Washington Gas will update the Program Implementation Plan to include an Executive Summary inclusive of the current year's performance in PIPES compared to both the annual project list and the current approved PIPES plan for each sub-program. Additionally, the Company will provide the Program 10 performance as it relates to each sub-program. Finally, Washington Gas will document the average number of crews used to complete the prior year's work as well as the estimated number of crews anticipated to meet the remainder of the current PIPES Plan.

- **COMMISSION RESPONSE: ACCEPT:** With respect to Audit Report Recommendation 2.12 (Executive Summary for the PIP), the Commission accepts the recommendation to provide a cover page plus three pages for each approved program (currently six approved programs): Current year, current year in PROJECTpipes, and current year in Life-of-Plan – (See Recommendation 2.2: Services Life-of-Plan, Recommendation 2.4: EVA Program, and Recommendation 2.11: Life-of-Plan for related commentary). The new/updated plan shall include: (1) an executive summary that provides the current year compared to both the Annual Project List, and the overall approved plan filtered by sub-program; (2) Program 10 performance as related to each sub-program to help track progress on each material category; and (3) current crews and estimates on crews required to complete the current PIPES plan.

- **WGL REPLY COMMENTS:** Washington Gas will create an executive summary to be submitted with the Company's updated Program Implementation Plan in the second quarter of 2025 and subsequent years.

15. RECOMMENDATION 2.13 – THERE ARE MULTIPLE RECOMMENDATIONS OR ACTIONS THAT ORIGINATED FROM THE MAY 19, 2021, TECHNICAL CONFERENCE WHERE ADDITIONAL EFFORTS OR FOCUS REMAIN APPROPRIATE. CONTINUUM REINFORCES THE FOLLOWING INITIATIVES AND ENCOURAGES WGL TO TAKE DEFINED ACTION ON THESE TOPICS AND EITHER IMPLEMENT THEM, REFINE AND IMPLEMENT THEM, OR DEFINE WHY THEY ARE INAPPROPRIATE AND REPORT THESE EFFORTS ANNUALLY AS PART OF THE PIP.

- **WGL RESPONSE:** The Company has solicited external stakeholder involvement in working with DDOT to effectuate changes in rules and regulations that would lead to reducing pipes costs. However, to date, Washington Gas has not received actionable support from external stakeholders in executing this recommendation. Washington Gas regularly meets with DDOT permitting staff to discuss the inconsistent and ever-changing requirements of traffic control plans, construction drawing reviews, and other impacts to the Company's underground replacement work.

- **COMMISSION RESPONSE: PARTIALLY ACCEPT:** The Commission accepts with modifications the Audit Report Recommendation 2.13 (Cost Driver Conference). The Audit Report recommends encouraging WGL to take definitive action with respect to its interaction with DDOT and to implement, refine, or define why they are inappropriate, and annually report these efforts as part of the PIP. The

recommendations or actions include: (a): develop a committee (DDOT Regulation Refinement Committee) comprised of affected utilities and interested stakeholders to present a cost and impact analysis of DDOT's current requirements and propose changes to DDOT's regulations to the D.C. Council; (b) assist the DC UCC regulation refinement efforts by participating in the Utility Coordination Committee (UCC), which includes utilities operating in the District of Columbia and DDOT, to allow discuss issues affecting all participants, such as proposed DDOT regulation changes and impacts on ratepayers, better coordination on projects, and comparison of permit approval requirements; and (c) Conducting a formal Impact Study on permitting in D.C. Code and regulations to suggest ways to streamline the permitting process. WGL states that the Company solicits external stakeholder involvement and that it is not opposed to these recommendations. The Commission recognizes that this has been an ongoing challenge for WGL, and permitting delays affects the Company's productivity and costs. The Commission will facilitate additional technical conferences with DDOT and WGL to continue the ongoing dialogue started in 2023.

- **WGL REPLY COMMENTS:** The Company has met with DDOT and the Deputy Mayor's Office, however, these efforts have not resulted in any policy change. Washington Gas is available to identify specific projects that may be feasible to initiate a pilot program, lessening the construction restrictions, to be coordinated with DDOT. The Company continues to believe it is in the best interest of its customers and the residents to increase collaboration and seek actionable solutions that will facilitate the efficient replacement of aging infrastructure within the District of Columbia while balancing DDOT and other policy priorities. Washington Gas will await action of the Commission, per Order No. 22003 whom will be facilitating these discussions.

16. RECOMMENDATION 2.14 – MAKE A FORMAL ASSESSMENT OF THE OPPORTUNITY, STRENGTHS, AND WEAKNESSES OF INTERNAL CREW USE BY WGL AS PART OF A LARGER CAPITAL CONSTRUCTION AND O&M STRATEGY TO SUPPORT PROJECTPIPES LIFE-OF-PLAN REQUIREMENTS AT EACH PROJECTPIPES RENEWAL OR EVERY FIVE YEARS, WHICHEVER IS SHORTER.

- **WGL INITIAL RESPONSE:** Washington Gas, at various intervals, has evaluated the utilization of internal versus external crew resources. The decision to proceed with external crew resources has granted the Company the maximum flexibility to increase or decrease resources with the fluctuation of PIPES work. The Company will complete a documented assessment at each PIPES renewal of the use of internal versus external crew resources.

- **COMMISSION RESPONSE: ACCEPTS:** Audit Report Recommendation 2.14 (Internal Crew Usage) makes a formal assessment of the opportunity, strengths, and weaknesses of internal crew use by WGL as part of a larger capital construction and O&M strategy to support PROJECTpipes Life-of-Plan requirements at each PIPES renewal, or every five years, whichever is shorter. WGL states the Company appreciates the flexibility to use internal and external crews, but the Company will make a formal assessment of internal/external crews in a PIPES renewal request. In addition, WGL notes that it has benchmarking analysis for 2023 for similar utilities, in accordance with Audit Report Recommendation 2.15, and will evaluate the results. WGL ALSO noted the Company plans to include their evaluation of new technologies with the District SAFE Annual Report, as recommended by Audit Report

Recommendation 2.17. PWBLDC asserts the Commission should reject the recommendation and notes the extensive training necessary to bring on qualified crews. The Commission accepts Recommendation 2.14 and modifies the recommendation to include the suggested evaluations to be added to the restructured PROJECTpipes Application. The new/updated plan should include the aforementioned modifications.

- **WGL REPLY COMMENTS:** The Company will conduct a formal assessment for the use of internal versus external crews to be submitted within 18 months of the approval of "DC SAFE" in Formal Case No. 1179.

17. RECOMMENDATION 2.15 – PERFORM A BENCHMARK AND BEST PRACTICE COMPARISON OF MAJOR URBAN CITIES WHERE CRITICAL COORDINATION ON UNDERGROUND INFRASTRUCTURE CONSTRUCTION IS NECESSARY AMONG CITY PERMITTING AUTHORITY, CITY TRANSPORTATION AUTHORITY, ELECTRIC UTILITY, GAS UTILITY, AND SEPARATE 811 AUTHORITY. THE OBJECTIVE OF THIS STUDY IS TO ESTABLISH THE PROCESS SPECIFICALLY USED TO COORDINATE UNDERGROUND CONSTRUCTION AND THEN DOCUMENT THE BEST PRACTICES USED TO CONTROL COST, PROTECT THE PUBLIC, SPEED THE RESOLUTION OF WORK, ETC.

WGL RESPONSE: [BEGIN CONFIDENTIAL] [redacted] **[END CONFIDENTIAL]** This was affirmed in the previous management audits conducted by Jacobs Engineering[3] and the Liberty Consulting Group.[4] In Q4 of 2022, the Company established a Business Transformation Office that is evaluating end-to-end process flows to explore potential improvement opportunities.

Construction conditions in DC pose unique challenges that are not necessarily present in other cities which make benchmarking efforts without direct and active participation likely to result in incorrect conclusions due to the inability to compare true like-kind conditions. The referenced types of unique construction conditions in DC include but are not limited to: restricted work hours on all work; limited to 300' or less work zones; mandated saw cutting of hard surfaces which include ~10" of concrete base throughout the majority of DC streets; site specific traffic control plans ("TCPs") and no usage of typical TCPs even when slight changes are needed; installation of chain link fence tree protection around all trees in the work zone regardless of whether they will actually be impacted; requirement to hand dig or use vacuum excavation around all tree roots; no stockpiling of materials onsite and complete haul-off; significant traffic control restrictions; the maintenance of pedestrian and bicycle pathways through the worksite instead of detouring them around the worksite; unmarked dense underground facilities; jurisdictional restriction on placing main facilities behind the curbs in green space thus forcing installation in

[3] GT97-3, GT06-1 and Formal Case No. 1027, WGL VMCR Program Management Audit Report – Public Version (February 6, 2016) at 66.

[4] Formal Case No. 1115, Liberty Consulting Group Management Audit of PROJECT*pipes* Final Report – Public Version (April 19, 2019) at 10.

hard surface roadways; jurisdictional discretion on paving limits and requirements; and special considerations for historical infrastructure, age of the system, and various other factors that were presented in the Company's Technical Conference Report on Lowering PROJECT*pipes* Unit Costs.[5] Due to the efforts the Company has undertaken and continues to do so related to construction best practices and cost controls, the Company disagrees with this recommendation.

- **COMMISSION RESPONSE: ACCEPTS:** The Commission accepts Audit Report Recommendation 2.15 (Urban Challenges Benchmark/Best Practice Comparison), which suggests that WGL perform a benchmark and best practice comparison of major urban cities where critical coordination on underground infrastructure construction is necessary among city permitting authority, city transportation authority, electric utility, gas utility, and separate 811 authority. The objective of this study is to establish the process specifically used to coordinate underground construction, and then document the best practices used to control cost, protect the public, and speed the resolution of work. Areas that should be used for potential benchmark and best practice comparison include:

City	Gas	Electric	Separate 811
Birmingham, AL	Spire	Alabama Power	No
Boston, MA	National Grid	Eversource	No
Brooklyn, NY	National Grid	ConEd	Yes
Chicago, IL	Peoples Gas	Exelon	Yes
Columbus, OH	NiSource	AEP	No
Jacksonville, FL	TECO	JEA	No
Las Vegas, NV	Southwest Gas	NV Energy	No
Los Angeles, CA	SoCal Gas	LADWP	No
Philadelphia, PA	PGW	PECO	No
Phoenix, AZ	Southwest Gas	Arizona Public Service	No
St. Louis, MO	Spire	Ameren	No

WGL conducted a benchmark assessment in 2021 to evaluate contract rates and terms, and concluded their rates were below benchmark averages. In 2022 Q4 the Company established a Business Transformation Office for the purpose of evaluating potential process improvements. In 2023, WGL supported an industry peer review of construction best practices and plans to evaluate those results once they are available. PBWDLC was supportive of the benchmarking recommendations and requested to be included in any benchmarking studies. We believe that the recommendation of benchmarking and best practice comparisons with major urban cities is a good suggestion, even where WGL faces challenges that may not be comparable to other jurisdictions. WGL shall provide the results of their 2023 best practices evaluation and work with peers who have similar dense urban environments to evaluate further potential improvements and best practices.

- **WGL REPLY COMMENTS:** Washington Gas participated in a peer review of construction best practices in 2023, however, the supporting Company did not complete the study, therefore, this evaluation is not available to be submitted. The

[5] Formal Case No. 1154, Technical Conference Report on Lowering PROJECT*pipes* Unit Costs (May 19, 2021).

Company will continue to participate in best practice discussions and employ realistic, efficient technology in the District where deemed prudent and reasonable.

18. RECOMMENDATION 2.16 – AS IS RECOMMENDED IN THE IPC STUDY, WGL SHOULD ADOPT A GIS SYSTEM FOR ASSET MAPPING AND REQUIRE NOTIFICATION THROUGH 811 USING GPS COORDINATES. DCPSC SHOULD ALLOW THE RECOVERY OF THE COST TO ELECTRONICALLY MAP THESE ASSETS AS IT BOTH PROTECTS AND EXTENDS THE LIFE OF UNDERGROUND ASSETS.

- **WGL INITIAL RESPONSE:** Washington Gas currently uses a GIS system (Smallworld) for asset mapping. The Company intends to start the buildout to transition away from its current mapping system SmallWorld to ESRI ArcGIS estimated starting in Q2 of 2024. The current plan is slotting this effort to last through 2026. After the ESRI ArcGIS system is updated and active, the Company will be able to assess the feasibility of electronically mapping its assets with GPS accuracy which is currently not available with the existing platform.

- **COMMISSION RESPONSE: REJECT:** Audit Report Recommendation 2.16 (GIS System Adoption), would require WGL to adopt a GIS system for asset mapping, and require notification through 811 using GPS coordinates.39 In response, WGL contends it uses Smallworld as their GIS asset mapping, but plans to build out and transition to ESRI ArcGIS in 2Q of 2024, with completion in 2026, and will reevaluate mapping at that time. Smallworld is incapable of mapping with GPS accuracy. The Commission rejects this recommendation as premature, since WGL is transitioning to a new GIS system for asset mapping that will not be operable until 2026. The evaluation of the new software will be part of future prudency review and rate case evaluations and should be handled at that time.

- **WGL REPLY COMMENTS:** No comment required.

19. RECOMMENDATION 2.17 – WGL HAS SIGNIFICANT EXPERIENCE WITH CONTINUOUS IMPROVEMENT AND PROCESS IMPROVEMENT EFFORTS, PARTICULARLY IN VIRGINIA AND MARYLAND. IT IS RECOMMENDED THAT WGL SET UP A CONTINUOUS IMPROVEMENT AND PROCESS IMPROVEMENT EFFORT IN DC WITH A TARGET OF INVESTIGATING A MINIMUM OF TWO NEW TECHNIQUES, PROCESSES, EXCAVATION METHODS, ETC. ANNUALLY AND REPORT THE RESULTS OF THE TESTS ON THEIR IMPACT ON REDUCED COST INCURRED, FIELD PRODUCTION, AND SAFETY TO VP OF CONSTRUCTION AND/OR ARP EXECUTIVE GOVERNANCE COMMITTEE.

- **RESPONSE:** See the Company's response to Recommendation No. 2.15 regarding benchmarking.

  Washington Gas is a participant in numerous natural gas industry resource groups and organizations. Through the collaboration efforts with these various forums, the Company is continuously looking for ways to enhance and streamline the delivery of natural gas to its customers and to increase construction efficiency. Washington Gas implements these process improvements in the District of Columbia, Maryland,

and Virginia service territories. The Construction Team works together across territories to ensure consistency in its processes and procedures regardless of area.

Washington Gas is a member Company in the American Gas Association ("AGA") and has representatives on the AGA Board, as well as the engineering and operations committees. The Company's participation involves a regular cadence of meetings which include presentations, white papers, round table discussions, operations conferences, and exhibitions by vendors of new technologies. This involvement provides Washington Gas with networking to discuss with peer's pilots and implementation of various technologies across the industry as well as leading practices, and new processes to better address the resource needs of the industry. Washington Gas has the same Board level and committee level participation in the Southern Gas Association ("SGA").

In addition to AGA and SGA, Washington Gas funds memberships for Gas Technology Institute ("GTI") Operations Technology Development ("OTD") and Sustaining Membership Program ("SMP"). These organizations focus on research and development ("R&D") from proof of concept to full commercialization of products and technologies revolving around enhancing safety for both people and pipeline and focusing on efficiency and effectiveness of processes. The Company has employed new technologies through these coordination efforts such as keyhole technology and materials tracking and traceability.

Washington Gas also belongs to numerous other groups, both regionally and nationally, such as the Gas Pipeline Advisory Committee ("GPAC") and Northeast Gas Distribution Council ("NEGDC"), etc. which further establishes the network to share ideas and industry knowledge. While Washington Gas is constantly evaluating new technologies through these forums and evaluating their feasibility to be implemented within the District, the Company will commit to formally documenting any technologies considered for implementation in the District on an annual basis to be included in the accelerated replacement program reporting requirements.

- **COMMISSION RESPONSE: ACCEPT:** Audit Report Recommendation 2.17 (New Technology Investigation) recommends WGL create a continuous process improvement effort in the District with a target of investigating a minimum of two new techniques, processes, and excavation methods on an annual basis. The results of the tests on the impact on reduced cost incurred, field production, and safety should be reported annually to VP of Construction and/or ARP Executive Governance Committee. WGL asserts the Company participates in numerous natural gas industry resource groups and is continuously looking to improve process and construction practices. WGL states it continues to evaluate areas of improvement and will formally document any technologies considered for implementation in the District on an annual basis as part of an accelerated replacement program reporting requirements. The Commission accepts the recommendation and directs WGL to also include in the annual report any operational or technological differences in Virginia and Maryland and the rationale for those differences.

- **WGL REPLY COMMENTS:** Washington Gas will include a narrative of technologies considered and/or implemented in the District for the annual reconciliation reports submitted in Formal Case No. 1179. Additionally, the Company will provide

discussions on any consistent operational or technological differences between the District, Maryland, and Virginia.

20. RECOMMENDATION 3.1 – DEVELOP A FORMAL DOCUMENT REVIEW PROCESS TO IMPROVE THE ACCURACY OF DOCUMENTS.

- **WGL INITIAL RESPONSE:** Washington Gas will enhance its current process document for Merger Commitment No. 72 ("MC 72") to include a formal review and approval of the calculations with the Director of Construction Management, Director of Construction, and Director of Construction Program Strategy and Management. This process will be included in the Company's Program Implementation Plan and the narrative will be updated consistent with new procedures. Additionally, Washington Gas will enhance its monthly ARP Governance dashboards to include regular tracking of the Company's MC 72 requirements including the expected impact to the PIPES charges eligible for recovery under the surcharge.

- **COMMISSION RESPONSE: ACCEPT:** The Audit Report Recommendation 3.1 (Document Accuracy) recommends that WGL develop a formal document review process to improve accuracy of documents.46 WGL indicates that the Company will enhance their current document process to include formal review and approval from the directors of Construction, Construction Management, and Construction Program Strategy and Management. Such enhancement will be documented in the PIP and will be added to Governance dashboards to ensure that tracking of Commitment 72 requirements is part of regular reporting. The Commission accepts the recommendations for document improvement and monitoring accuracy.

- **WGL REPLY COMMENTS:** Washington Gas will update the current Merger Commitment 72 review processes to include formal review signature and will be detailed in the Program Implementation Plan submitted in the second quarter of 2025.

21. RECOMMENDATION 3.2 – DEVELOP A FILE NOMENCLATURE PROCESS FOR CLASS 3 ESTIMATES THAT SHOWS THAT THE DOCUMENT IS THE FINAL DOCUMENT.

- **WGL INITIAL RESPONSE: RESPONSE:** Although Continuum identified inconsistencies in the naming convention of the Class 3 estimate files, the Company is compliant in performing AACE Class 3 estimates. However, Washington Gas will develop guidance documentation for the consistent naming of Final AACE Class 3 project estimates and will include it in the PROJECT*pipes* Program Implementation Plan.

- **COMMISSION RESPONSE: ACCEPT:** The Commission accepts the Audit Report Recommendation 3.2 (File Nomenclature) requiring the Company to develop a file nomenclature process for Class 3 Estimates that would clarify a document is a final document. The new/update Application should include detailed information on the nomenclature process for Class 3 Estimates.

- **WGL REPLY COMMENTS:** Washington Gas will formalize the nomenclature process for Class 3 estimates and will be included in the Program Implementation Plan submitted in the second quarter of 2025.

ATTESTATION

I, WAYNE JACAS, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

WAYNE JACAS

09/26/2024

DATE

WITNESS STUBER
EXHIBIT WG (D)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

DIRECT TESTIMONY OF AARON C. STUBER
Exhibit WG (D)
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EXHIBIT WG (D)

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF AARON C. STUBER

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Aaron C. Stuber. I am the Senior Director of Asset Management at Washington Gas Light Company ("Washington Gas" or "Company"). My business address is 6801 Industrial Road, Springfield, VA 22151.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I received a Bachelor of Science degree in Chemical Engineering from the University of Tulsa and am a Professional Engineer in Oklahoma, Virginia, West Virginia, Maryland and the District of Columbia. I have over 29 years of engineering, integrity management, construction, operating and environmental experience in the natural gas industry, with 23 years of experience with Washington Gas. My experience with Washington Gas includes various positions of increasing responsibilities within Corporate Engineering. In 2021, I became Senior Director of Asset Management, and I am currently responsible for the Transmission Integrity Management Program ("TIMP"), Distribution Integrity Management Program ("DIMP"), Facility Integrity Management Program ("FIMP"), Damage Prevention, Codes & Standards and System Planning. Prior to my employment with Washington Gas, I was employed by

Domain Engineering as a Sr. Process Engineer and CETCON as an Environmental Specialist.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY BEFORE ANY STATE REGULATORY COMMISSIONS?

A. Yes. I have previously submitted testimony to the Maryland Public Service Commission ("Maryland Commission") in Case Nos. 9335, 9486 and 9708, regarding the "STRIDE" Plan ("Strategic Infrastructure Development and Enhancement"), the Company's accelerated replacement program in Maryland. I have also appeared several times before the Maryland Commission during Administrative Meetings in support of various STRIDE filings. In addition, I have submitted testimony to the Virginia State Corporation Commission in PUE-2015-00017, PUE-2017-00102 and PUR-2021-00283, involving the Company's request for approval of the Company's Virginia "SAVE" Plan ("Steps to Advance Virginia's Energy"). Further, in the District of Columbia ("D.C."), I provided testimony in support of the PROJECT*pipes* 2 Plan, in Formal Case No. 1154, and the PROJECT*pipes* 3 Plan, in Formal Case No. 1175.

II. PURPOSE OF TESTIMONY

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of Washington Gas Light Company ("Washington Gas" or the "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the reasons why the Company has implemented the JANA Lighthouse Integrity Management Platform ("JANA" or "JANA Lighthouse"), and the benefits associated with that transition. In

addition, my testimony will discuss sections of the District SAFE Plan as well as the enhancement in the prioritization of service-only replacement projects as a result of the introduction of the JANA risk model.

Q. WHAT PORTIONS OF DISTRICT SAFE ARE YOU SPONSORING?

A. I am sponsoring Sections II and III of the Plan. I describe this in greater detail in Section V of my testimony, below.

III. ORGANIZATION OF TESTIMONY

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into three additional sections. Section IV describes the Company's process for identifying and selecting the JANA Lighthouse platform, a best practice, fully probabilistic risk assessment model. Section V addresses the portions of District SAFE that I am sponsoring. Finally, Section VI describes the enhancement in prioritization of service-only replacement projects due to the introduction of the JANA risk model.

IV. IMPLEMENTATION OF JANA

Q. WHY DID WASHINGTON GAS INITIATE A SEARCH FOR A NEW RISK MODELING PROGRAM?

A. The Company's decision to explore and transition to a more advanced risk modelling framework was based largely on guidance from PHMSA encouraging the implementation of a fully probabilistic risk model that would provide the Company with a stronger foundation for risk assessment and pipeline replacement prioritization. Specifically, on February 1, 2020, PHMSA issued a report entitled *Pipeline Risk Modeling Overview of Methods and Tools*

for Improved Implementation ("PHMSA Report").[1] In the PHMSA Report, PHMSA identified a fully probabilistic risk model as a best practice for supporting decisions related to pipeline integrity. After reviewing this report and assessing Washington Gas's then current capabilities against best practices, the Company made the decision to further evaluate and pursue a fully probabilistic risk model.

Q. WHAT IS A FULLY PROBABILISTIC RISK MODEL?

A. A fully probabilistic risk model forecasts risk based on discrete probabilities and explicit consequences, considering the range of potential risk outcomes and their associated probabilities. In a fully probabilistic risk model, different types of threats are evaluated, including corrosion threats, joint failure, and third-party damage. The probabilistic approach further breaks down these threats into more specific events that can lead to pipe failure, capturing the unique failure mechanisms associated with different types of threats. For example, the threat of natural forces damage on a distribution pipe segment is modeled into separate sub-threats for rain or flood damage, earth movement, frost heave, and lightning strikes. For each of these sub-threats, the likelihood of various outcomes is calculated. These outcomes include the full range of potential scenario pathways that can occur from a leak event. Lastly, a set of consequences are calculated for each of these outcomes, capturing impacts along a variety of dimensions including health and safety, environmental, community, direct impacts (*e.g.*, property damage, repair, etc.), and regulatory results (*e.g.*, fines, civil penalties, etc.). This complex calculation accounts for both the probability of each consequence factor occurring and the associated

[1] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2020-03/Pipeline-Risk-Modeling-Technical-Information-Document-02-01-2020-Final.pdf

impact, considering the characteristics of the asset such as its material type, age, location and historical industry data.

This type of analysis is performed for each threat category and for each asset in the system. As a result, the model output gives a broader representation of the range of possible outcomes. The individual outputs are also combined to estimate the total risk on any given asset or group of assets, while ensuring that the underlying mechanisms driving each threat, as well as uncertainties in the data, are considered.

Q. WHAT STEPS DID THE COMPANY TAKE IN ORDER TO SELECT A FULLY PROBABILISTIC RISK MODEL?

A. To determine the best risk-modeling software to align with PHMSA's best practices and achieve its goal of better supporting risk-management decisions for the Company's pipelines, thereby enhancing safety on the system, the Company first issued a request for information ("RFI") in September 2021 and, subsequently, issued a request for proposals ("RFP") in November 2021 to identify a new risk model provider. In its RFP, the Company sought competitive bids on a new fully probabilistic risk model provider capable of providing a suite of products for all asset classes including distribution, transmission, facilities, and storage. As a result of this two-stage process, the Company evaluated proposals from three different providers. Based on a thorough assessment of each proposal, the Company elected to move forward with implementing the JANA platform.

Q. WHY DID WASHINGTON GAS SELECT JANA AS ITS PLATFORM?

A. Through the evaluation process, the JANA Lighthouse platform scored the highest in the Company's technical ranking. JANA also ranked highest in

functional risk modeling capabilities, having experience with probabilistic risk models across multiple asset classes. For these reasons, the Company made the decision to move forward with JANA as its risk-assessment software. Washington Gas commenced using JANA for risk prioritization modeling activities for design of mains and service replacements in 2023 and the addition of service-only replacements in 2024. JANA was used to produce the 2024 PROJECT*pipes* project list for mains and service replacements. In 2025, the Company's project list will include both main and service, as well as service-only projects, informed by the JANA risk model. The JANA risk model will be used to develop subsequent project lists under the proposed District SAFE Plan as well as the project lists in other jurisdictions.

Q. IS JANA WIDELY USED IN THE GAS UTILITY INDUSTRY?

A. Yes. JANA was founded in 1999, and its risk models are in place at utilities that provide natural gas service to over 51 million homes in the U.S. and Canada. Further details on the use of JANA are covered in the testimony of Company Witness Ken E. Oliphant, the Executive Vice President and Chief Innovation Officer for JANA.

Q. WHY DID THE COMPANY DISCONTINUE THE USE OF ITS PRIOR RISK MODEL, OPTIMAIN?

A. Washington Gas ceased using Optimain, the risk-analysis software that the Company relied on to prioritize pipe segments for replacement from 2000 to 2023, for three primary reasons. First, Optimain functioned only as a partially probabilistic model, and was therefore no longer considered a PHMSA best practice approach. Specifically, Optimain used probabilistic algorithms to calculate likelihood to leak and a subject matter expert derived weighted

consequence factors. Second, Optimain assessed only the risk of distribution assets, and not the full suite of assets (*i.e.*, distribution, transmission, facilities, and storage) for which Washington Gas has a safety obligation, and the Optimain risk model could not produce risk analyses that allowed main and service projects to be directly compared with service-only projects for risk reduction purposes. Third, in January 2022, Washington Gas was notified that the software provider for Optimain would no longer provide maintenance and support services for the Optimain platform beyond March 31, 2023. Therefore, it was vital that the Company obtain a new risk-analysis platform to continue identifying and prioritizing pipe segments for replacement to enhance the safety and reliability of the Company's distribution system while reducing greenhouse gas emissions. To be clear, as of March 31, 2023, there was no option for Washington Gas to continue using Optimain.

Q. WHAT ARE THE SAFETY BENEFITS OF MOVING TO THE JANA LIGHTHOUSE PLATFORM?

A. As a fully probabilistic risk model, the JANA Lighthouse solution provides a superior understanding of both the drivers of risk associated with natural gas infrastructure and the effectiveness of actions to reduce risk. Where legacy approaches to risk modelling required extensive subjective input (*i.e.*, requiring subject matter experts to assign "risk scores"), probabilistic risk models use objective empirical data inputs to effectively simulate the mechanisms underlying various threats, taking into account outcomes and impacts observed throughout the industry. This approach more effectively represents overall and threat-specific risk, maximizes the value of the data available today, and reduces the potential of unconscious bias that subjective approaches may

introduce. Rather than providing relative outputs (*i.e.*, a certain asset is comparatively higher risk than another), fully probabilistic models provide a quantification of risk and then project that risk into the future, allowing for the Company to plan for the resources needed to manage that risk.

Q. WHAT DATA DOES JANA INCORPORATE FROM THE WASHINGTON GAS SYSTEM?

A. JANA Lighthouse uses a variety of data from Washington Gas as model inputs. Basic asset data typically includes the following categories: asset properties (*e.g.*, geometry, size, installation year, material properties); asset operating conditions (*e.g.*, pressure, pressure history); installation details (*e.g.*, depth of cover, installation method); and maintenance/inspection history. Additional data sources are also used to supplement the asset data; for example, information about the local environment, such as soil pH, surrounding population and infrastructure, proximity to road/rail crossings, flood zones, etc. is used to inform probability analysis of threats and consequences. Through the District SAFE program, the Company will have the opportunity to collect and record these types of asset data for every project completed, which can then be used to enhance JANA's modeling abilities. The use of extensive Washington Gas data makes the JANA model more responsive to the Company's needs.

In addition, the Company will input leak data to optimize the basic asset data. When a leak is detected, Washington Gas first classifies the leak and, depending on its classification, prioritizes the repair. Once the leak is repaired, the Company records observations on cause, as well as repair or replacement details, in its work management system, allowing the leak data to be analyzed. Once this process is complete, the Company inputs the data into JANA, where

it serves as the basic asset dataset for the modeling software. This facilitates JANA's ability to assess the risks on the Company's system and the potential consequences that may arise due to a leak or a failure.

Q. IN ADDITION TO COMPANY DATA, WHAT DATA DOES THE JANA LIGHTHOUSE PLATFORM RELY ON FOR RISK ANALYSIS?

A. Data from outside sources that informs the risk model is discussed in Witness Oliphant's direct testimony.

Q. HOW WILL THE JANA DATA SET EVOLVE OVER TIME?

A. Inputs will change over time as new data becomes available and is added to the models[2], whether through the District SAFE program, leak detection and repair, or targeted data gathering activities. Probabilistic model outputs can inform and support the need for data remediation and collection efforts, which can in turn feed back into the models and drive further model improvement (*i.e.*, reduce uncertainty) over time. The flexibility of the JANA models — including the ability to evaluate a significant number of standard inputs, which are supplemented with third-party data and client-specific inputs — maximizes the utility of currently-available data.

In addition to using JANA Lighthouse for risk analysis on distribution assets, over time the Company plans to implement it for the evaluation of risk on other asset classes such as transmission, facilities and storage. Because the JANA models quantify risk on an absolute basis, the risk can be compared

[2] The JANA Lighthouse risk model is made up of a lattice work of sub-models that, on the probability or likelihood of failure side capture the unique aspects of each threat and asset type, and on the consequence side, capture the unique aspects of each consequence type, which are combined in order to arrive at the total risk of each pipe segment.

across all of the asset classes, allowing the Company to better prioritize addressing risk across all asset classes.

Q. WHAT ARE THE MAJOR BENEFITS OF USING JANA?

A. There are at least three major benefits. First, as explained earlier, it is a fully probabilistic risk model, which is identified by PHMSA as a best practice. In assessing risk, it goes beyond leak and maintenance history for mains by considering a variety of additional factors — including historical industry data, each asset's operating environment, and the physical mechanisms driving each threat — for the entire system – while accounting for the quality of the underlying data. Second, JANA assesses the risk of services alone and prioritizes them rather than only prioritizing services associated with mains. I describe with greater detail why this is a benefit later in my testimony. Third, it will allow for the assessment and comparison of risk for various asset classes such as distribution, transmission, facilities and storage, rather than just distribution. Because JANA is a more comprehensive risk model, it will ultimately allow the Company to assess all asset classes using the same risk modelling approach, thereby allowing for better prioritization across all asset classes that furthers public safety.

Q. HOW DOES JANA COMPARE TO OPTIMAIN?

A. In comparison to Optimain, JANA Lighthouse provides the Company with a more representative picture of present and future risk. JANA Lighthouse buttresses the Company's ongoing efforts to reduce system risk, by providing measurable and actionable risk insights that support the effective comparison, optimization, and execution of replacement prioritization.

V. SUPPORT FOR THE DISTRICT SAFE PLAN

Q. WHAT DO THE SECTIONS OF THE DISTRICT SAFE PLAN THAT YOU ARE SPONSORING COVER?

A. I am sponsoring Section II of the District SAFE Plan which covers the Washington Gas system in the District, specifically the age of the facilities in the District as well as the material type of facilities that are located in the District. In addition, I am sponsoring Section III of the Plan which covers historical leaks that have occurred in the District. These sections of the Plan include data this is directly responsive to information identified for inclusion by the Commission in Order No. 22003.

Q. PARAGRAPH 51.I OF THE COMMISSION'S ORDER ASKS WHETHER LEAKS IDENTIFIED BY ADVANCED LEAK DETECTION ("ALD") ARE PROCESSED DIFFERENTLY IN JANA THAN LEAKS FOUND THROUGH TRADITIONAL METHODS? PLEASE DESCRIBE THE COMPANY'S PROCESS.

A. Leaks identified by ALD are repaired and information related to these leaks is provided to JANA as inputs to the risk model in the same manner as information that is provided to JANA for leaks identified through traditional methods. JANA processes the leak data in the same fashion, regardless of the method by which the leak is identified.

VI. SERVICE-ONLY REPLACEMENT PRIORITIZATION

Q. PLEASE EXPLAIN HOW SERVICE-ONLY REPLACEMENT PROJECTS WERE PRIORITIZED PRIOR TO USING THE JANA RISK MODEL.

A. Optimain did not have the ability to produce risk analysis that allowed main and service projects to be directly compared with service-only projects. As a result, the Company relied on internal subject matter experts to guide the allocation of resources between these two types of projects (main and service vs service-only), consistent with the timelines for each type of program reflected in PROJECT*pipes*. Specifically, the Company's DIMP group prioritized service-only replacement projects based on the average number of leaks on each targeted material type within a local geographic area. The targeted service population located in these areas were prioritized for replacement based on geographic leak rates *i.e.*, the ratio of leaks to the number of targeted services (likelihood) and type of building that they supplied (consequence). Strategically focusing on the population of service replacements based on the above prioritization method allowed the Company to proactively prevent future leaks in areas where leaks were known to be occurring, while also improving construction efficiencies.

Q. HOW HAS JANA IMPROVED THE COMPANY'S ABILITY TO PRIORITIZE SERVICE-ONLY PROJECTS FOR REPLACEMENT?

A. The JANA risk model evaluates the risk of both mains and services as well as service-only assets. Having the risk assessment conducted in a common model with risk output that is comparable allows the Company to better prioritize both of these asset groupings on a risk-reduced-per-dollar-spent basis in order to remove the most risk from the system with the available dollars.

Q. HOW WILL THIS IMPACT THE DISTRICT SAFE PROJECT LISTS?

A. Similar to the main and service projects, starting with the 2025 District SAFE project list, service-only projects are being identified for replacement

using the calculated risk-reduced-per-dollar-spent metric from the JANA risk model. The results for both main and service and service-only projects are compared and then are prioritized based on the risk-reduced-per-dollar-spent metric. Using this analysis, the risk results from JANA are more heavily weighted towards the replacement of service-only facilities relative to main and service facilities. The increased quantity of service-only projects is a result of the JANA risk model providing a more robust, wholistic and probabilistic analysis of the risk reduction for all main and service as well as service-only assets. When considering the factors around service only replacements, those facilities identified for replacement have a higher probability of leaks based on the data inputs (*e.g.*, age, material, etc.), are located in close proximity to dwellings, and have a lower cost of replacement while having a higher reduction in risk, thereby reflecting the most cost-effective option for removing risk from the Washington Gas system.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

ATTESTATION

I, AARON STUBER, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

AARON STUBER

9/17/24
DATE

WITNESS OLIPHANT
EXHIBIT WG (E)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF	)	
THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	)	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

PUBLIC VERSION

DIRECT TESTIMONY OF KEN E. OLIPHANT
Exhibit WG (E)
(Page 1 of 1)

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EXHIBIT WG (E)
PUBLIC

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF KEN E. OLIPHANT

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Ken E. Oliphant. I work for JANA Corporation ("JANA"), which is an engineering software firm that provides probabilistic risk software to energy utilities. My business address is 305 Unit 1 Industrial Parkway South, Aurora, ON, Canada.

Q. WHAT POSITION DO YOU HOLD WITH JANA?

A. My current position is Executive Vice President and Chief Innovation Officer. In that position, I am responsible for oversight of JANA's risk modeling technology and supporting the use of modeling outputs in Integrity Management decision making.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am a professional engineer specializing in risk modeling and performance forecasting of natural gas pipeline systems. I have over 30 years of experience in the pipeline industry, and I have spent the past 25 years at JANA overseeing the technical teams conducting testing, failure analysis and risk modeling of

pipeline system assets. I have published and presented over 60 papers on modeling pipeline systems, piping system testing, and material performance. I received an undergraduate degree in Chemical Engineering from the University of Toronto and a Ph.D. in Engineering Chemistry from Queen's University in Kingston, Ontario. I am a licenced Professional Engineer in the province of Ontario.

II. PURPOSE OF TESTIMONY

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of Washington Gas Light Company ("Washington Gas" or the "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to: (1); provide further details on the JANA risk modeling software and methodology, and describe how it is being deployed at Washington Gas and (2) address how JANA Lighthouse aids project prioritization in alignment with the District's climate goals.

III. ORGANIZATION OF TESTIMONY

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. In Section IV, I provide details on the JANA risk modeling approach generally and specifically as it is being deployed at Washington Gas. In Section V, I address how JANA Lighthouse aids project prioritization in alignment with the District's climate goals.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. In brief, the conclusions of my testimony are as follows:

- The JANA Lighthouse solution aligns with the District's climate goals as it prioritizes both mitigated safety risk in alignment with PHMSA regulations, and mitigated leaks in alignment with the District's climate goals. This is inherent in the mechanistic model structure and the nature of pipeline loss of containment (*i.e.*, leak) failures.
- JANA Lighthouse employes a robust, probabilistic (probabilistic models are considered best practice by PHMSA[1]), empirical set of models that can identify those assets most likely to leak in the future and the risk associated with those assets. For the pipeline assets in DC, the top 5% of assets projected by JANA Lighthouse to be the most leak prone were observed to have roughly 12 times (1200%) the leak rate in 2022 compared to the remaining 95% of assets. For the specific projects WGL selected using the JANA model outputs for ARP eligible assets (those projects with the highest risk reduction-spend efficiency (i.e., those projects that will take the most risk out of the system per dollar spent, representing just under 1% of the 400 plus miles of ARP eligible assets), the models forecast that greater than 96% of the potential for future leaks is removed annually on asset replacement along with greater than 90% of future risk.
- For leak-prone assets, simply repairing the asset does not address the future risk to the system or the potential future emissions associated with

[1] PHMSA: Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation, February 1, 2020.

that asset. Further, an approach that only addresses active leaks within a distribution system would not meet the requirements of PHMSA regulations in that it does not "minimize likelihood of release as well as address the consequences of potential releases."[2]

IV. JANA LIGHTHOUSE RISK MODELING METHODOLOGY

Q. PLEASE DESCRIBE JANA AND ITS APPLICATION TO NATURAL GAS PIPELINE SYSTEMS.

A. JANA was founded in 1999 as a testing and engineering laboratory for piping systems. JANA sold its laboratory assets in 2014 to focus exclusively on risk models for gas pipeline systems. JANA has over 160 employees in its Gas Pipeline Systems group, including three Ph.D.'s, 33 Masters, 16 Professional Engineers, and 51 Engineering graduates, as well as specialists in data science, statistics, reliability engineering, Artificial Intelligence ("AI"), Geographic Information Systems ("GIS"), and software development.

Q. CAN YOU DESCRIBE THE PURPOSE OF THE JANA LIGHTHOUSE SOLUTION?

A. Yes. The JANA solution is a tool for proactive integrity management that, through forecasting the likelihood of future failures in the pipeline system, the associated risk, and the impact of mitigative actions, provides Integrity Management SMEs greater understanding of the pipeline system and how to manage the risk of potential future failures. The solution does with asset specific (i.e., risk forecasts

[2] Docket No. PHMSA-2024-0043

for each asset in the system) granular risk outputs (i.e., capturing the threats driving risk for each asset, the impact of risk mitigations for each asset and the full range of potential consequences, enabling the development of targeted Integrity Management programs to manage system risk. The solution addressed PHMSA's Distribution Integrity Management Program (DIMP) requirements:

> [F]ederal pipeline safety and integrity management (IM) regulations require pipeline operators to use risk assessments. PHMSA's integrity management regulations (49 CFR part 192, Subpart O and subpart P; 49 CFR 195.452) require the continual evaluation of threats to pipelines, and evaluation of methods to minimize the likelihood of a release as well as address the consequences of potential releases. Risk models are a primary tool pipeline operators use as part of this evaluation process and are referred to as a "risk analysis" or "risk assessment".[3]

The JANA Lighthouse DIMP solution specifically addresses the 49 CFR part 192 Subpart P – Gas Distribution Pipeline Integrity Management (IM) requirements that operators have "knowledge" of their distribution system (by integrating system data from multiple disparate data sources), "identify threats" (through the risk models), and "identify and implement measures to address risks" (through the risk mitigation analysis). It is a tool to support management of risk due to future potential leaks, as required by PHMSA. It does this using a probabilistic approach to risk as considered best practice by PHMSA.

Q. CAN YOU PLEASE DESCRIBE HOW THE JANA LIGHTHOUSE SOLUTION PRODUCES "RISK SCORES AND RISK RANKINGS"?

A. Yes. A set of models is included in JANA Lighthouse that are configured to the specifics of Washington Gas's distribution asset system in terms of the specific

[3] Docket No. PHMSA-2024-0043

assets, asset data and historical system performance. The models are empirical, meaning that they rely on an extensive repository of data collected both in laboratory and field settings. The models are also probabilistic, in that they capture the probabilities of loss of containment failures and the range of potential outcomes from a loss of containment event and the associated consequences. The risk is then assessed based on the probabilities of loss of containment and the potential consequences, providing the system subject matter experts (SMEs) greater insight into system behavior and how to manage the risks within the system.

Q. PLEASE DESCRIBE JANA'S EXPERIENCE IN PROBABLISTIC MODELING FOR GAS PIPELINE SYSTEMS.

A. JANA has conducted probabilistic risk assessments for thirty-three (33) North American gas utilities across distribution, transmission, storage and facilities assets as of August 2024. JANA is currently deploying 56 instances of its risk modeling software at 29 gas utilities, including 17 active installations of distribution system software like that employed at Washington Gas, with eight additional in-flight (i.e., in the pre-use implementation phase) projects for US gas distribution operators (for a total of 25 gas distribution company deployments).

Q. HOW WAS THE JANA RISK MODELING APPROACH DEVELOPED?

A. JANA started developing its gas pipeline risk models over 15 years ago based on over 300 million hours of pipe testing experience and piping system failure

analysis generated in its piping laboratory, which resulted in a comprehensive, mechanistic understanding of gas pipeline system failures. This understanding, combined with analysis of historical industry data, including data from the PHMSA database of pipeline leaks and incidents and PHMSA advisory bulletins, National Transportation Safety Board ("NTSB") reports, regulations, and literature related to gas pipeline failure models, led to the development of a fully quantitative set of mechanistic-probabilistic models for gas distribution assets with a bow-tie threat-scenario type structure based on a Failure Modes, Effects, and Criticality Analysis ("FMECA"). These models collectively form JANA's Distribution Integrity Management model set ("J-DIMP™") embedded in the JANA software solution.

Q. WHAT IS A BOW-TIE THREAT-SCENARIO STRUCTURE?

A. A "bow-tie threat-scenario" structure is a common approach in risk assessment to assess risks where an event, such as loss of containment or a gas leak, has a range of possible causes (i.e., threats) and a range of potential consequence scenarios. Threats therefore make up one side of the bow-tie, and are linked to the central event (e.g., loss of containment or a leak) at the center of the bow-tie, and different consequence scenarios on the other side of the bow-tie. Each pathway is calculated separately.

Figure 1: A Bow-Tie Threat-Scenario Risk Assessment Approach Illustration

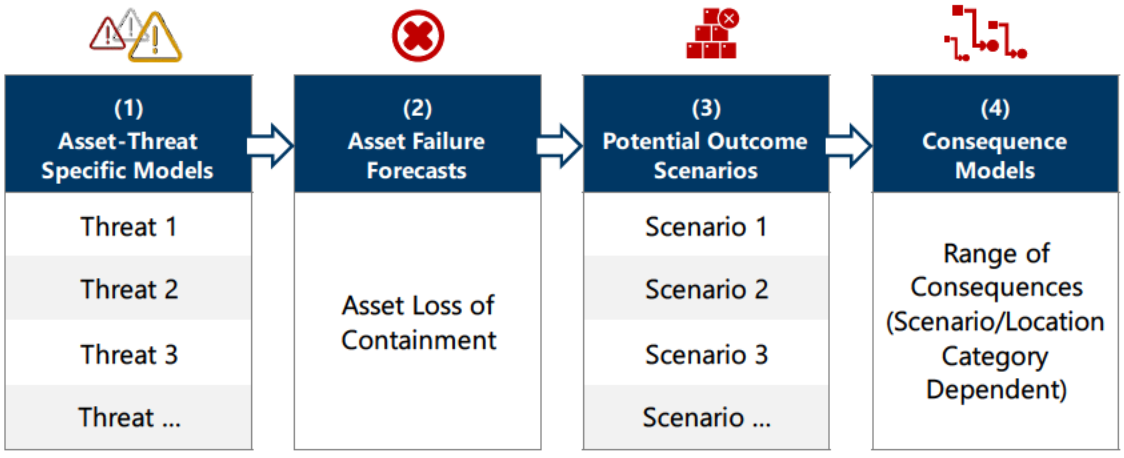
Q. HOW DOES JANA APPLY ITS J-DIMP TO SERVE ITS CUSTOMERS?

A. JANA applies a holistic approach to risk which is driven by the above-described quantitative, probabilistic risk models included in J-DIMP. Further, JANA applies what PHMSA describes as "Best Practices" in its *Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation* (February 1, 2020) — probabilistic risk modeling and software — to enable our clients to proactively manage leak and corrosion issues on gas pipelines. In simpler terms, the JANA system allows our customers to clearly forecast the future performance of their pipelines. The system SMEs are provided with a more robust picture of how the system will behave, where the top risks are, and how those risks can be mitigated. Through configuring the software to the specifics of the Washington Gas system, in the implementation process, the solution is tailored to the Company's system to reflect its assets and operating behavior.

Q. PLEASE EXPLAIN HOW THE JANA MODELS ASSESS RISK FOR A GIVEN ASSET.

A. Figure 2 provides a high-level overview of the JANA risk models. For each asset addressed, the full range of potential threats, the first box in Figure 2, is assessed through asset-threat specific models, which incorporate the primary threat drivers and, as appropriate, interacting threat drivers. These provide forecasts by threat, by asset, of loss of containment (asset failure), shown in box 2 in Figure 2. These are connected to potential outcome scenarios, and specifically the different potential outcomes from a loss of containment event, shown in the third box in Figure 2. Finally, JANA models specific consequences for each of those scenarios across a range of consequence categories, with the consequence values specific to the location category of the asset, as shown in box 4 in Figure 2. This is known as the "JANA risk modeling approach." Further, the distribution risk models under J-DIMP are compliant with 49 CFR 192.1007, which outlines PHMSA's prescribed elements of an Integrity Management plan.

Figure 2: Overview of JANA Risk Models



Q. HOW DOES THE JANA MODEL INCORPORATE NEW INFORMATION?

A. The JANA risk modeling approach has been continuously refined through the insights gained in each implementation and annual rerunning of the models with updated asset data, which ensures that the models continuously improve and evolve to reflect the changing pipeline system. Overall industry data, regulatory changes, and learnings across client implementations are used to continuously refine the overall modeling approach, and Washington Gas specific data is used to update and refine the Washington Gas specific model configurations. For each threat (the first box in Figure 2), proprietary reliability analysis methodologies are used to develop threat-asset specific forecasts of leak rates based on the specific historical system performance for Washington Gas, as well as incorporating a broader mechanistic understanding of gas system failures.

Q. WHAT SPECIFIC FACTORS ARE INCLUDED IN THE MODELS?

A. The models utilize empirically derived baseline failure rates for asset populations (*e.g.*, cast iron, bare steel, etc.) and adjust those up or down based on mechanistic or causal factors developed from the specific mechanisms of how failures transpire. This includes, but is not limited to, information on age, soil type, cathodic protection status, historic OneCall frequency, etc. that are empirically derived from historical system performance and broader industry experience. This derivation is done using a standard, proven reliability analysis approach.

This process is like the approach used by the insurance industry to set insurance premiums, where a base level is adjusted by factors that have historically been shown to increase or decrease risk from the baseline (*e.g.*, smoking versus not smoking).

Q. HOW HAS THE INCORPORATION OF THESE COMPANY-SPECIFIC FACTORS ALIGNED THE MODEL'S RESULTS WITH OBSERVED SYSTEM BEHAVIOR?

A. Incorporating factors associated with the Washington Gas system has provided accurate forecasts of future system leaks and differentiation of the most leak-prone asset sub-populations (forecast leaks per asset by threat – the second box in Figure 2). For the top 15% of assets in the DC system projected by JANA Lighthouse as the most leak-prone, the actual observed leaks in 2022 in those assets was roughly six times (600%) the leak rate in the remaining 85% of assets. For the top 5% of assets in the DC system projected by JANA Lighthouse as the most leak prone, the actual observed leaks in 2022 in those assets was roughly 12 times (1200%) the leak rate in the remaining 95% of assets. This clearly demonstrates the power of the JANA Lighthouse solution to forecast those assets within the overall asset population that are most likely to leak. The JANA Lighthouse leak forecasts, by threat, all fall within the 90% confidence limits of observed leaks through the 2017 – 2022 time period. The models projected leaks with an accuracy of 94% for 2022. Further, for the specific ARP eligible projects provided by Washington Gas based on the JANA model outputs, the models forecast that over 96% of the potential for future

leaks is removed annually on replacement of these specific leak prone assets along with greater than 90% of potential risk removed annually for these specific leak prone assets.

Q. PLEASE EXPLAIN HOW THE SCENARIO EVALUATION OPERATES IN THE MODEL.

A. Leak forecasts are tied to a scenario tree (the third box in Figure 2) that captures the different potential scenarios that can unfold for a gas system asset leak. For example, consider a gas distribution pipeline of the same size and operating pressure. We can see leaks that result in very little consequence (*e.g.*, those that are found by leak survey or odor), leaks of moderate consequence (*e.g.*, those where gas accumulation and ignition occur with limited damage), up to major significant incidents (*e.g.*, major property damage with injuries and/or fatalities – often referred to as "low probability – high consequence events" ("LPHC")).

Each of these consequences will have an associated probability. Some will be more likely than others. For instance, it is much more likely that a leak will be found and repaired than result in a significant incident. The net result is that gas pipeline incidents, like forest fires, earthquakes, power outages, etc., follow Power Law behavior (*i.e.*, they are characterized by long tail distributions where a few observations have very high values, with the majority having lower values)[4] versus the normal (*i.e.*, "Gaussian" distributions that are symmetric

[4] See IPC2016-64512: K. Oliphant, W. Bryce, W. Luff, *Power Law Analysis Implications of the San Bruno Pipeline Failure*, Proceedings of the 2016 11th International Pipeline Conference, IPC2016, September 26-30, 2016, Calgary, Alberta, Canada.

bell-shaped curves characterized by mean and standard deviation) that people are more accustomed to dealing with in statistical analysis. This has important implications for how risk needs to be assessed in probabilistic, quantitative terms – if these different scenario pathways and their associated probabilities are not captured, a complete picture of pipeline risk will not be developed.

Q. WHAT IS THE PURPOSE OF THE CONSEQUENCES COMPONENT OF THE MODEL?

A. Understanding the potential consequences, when combined with the probabilities of those occurring, enables the model to characterize the risk in the system. For each of the different scenario pathways, a set of consequence measures is applied (the fourth box in Figure 2). Again, these measures are empirically derived from Washington Gas system data and overall historical incidents within the pipeline industry. The data is developed for the different location categories within the Washington Gas system (*e.g.*, the same scenario will have different potential consequences in a Business District than in a Rural location).

Q. WHAT IS THE OVERALL RESULT PRODUCED BY THE JANA APPROACH?

A. The overall result of this process is an empirically derived forecast of baseline risk per asset in the system. For purposes of our analysis, an asset is a segment of main (a section of a main line of the same material and age), a service line or specific system component (e.g., riser, meter set, valve).

Q. PLEASE EXPLAIN THE MITIGATED RISK ASSESSMENT PROCESS FOR PIPE REPLACEMENTS AND HOW RISK REDUCTION IS MEASURED.

A. The risk mitigation on newly installed replacement pipe is assessed empirically using **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]**

Q. HOW DOES THE MODEL ASSESS THE IMPACT OF SPOT REPAIRS VERSUS PIPE REPLACEMENT?

A. Spot repairs are small-scale fixes that are accomplished through normal maintenance and leak response activity, such as the placement of a repair clamp over the leak. They are used to address an existing event – an active leak. The model incorporates this leak event data into future risk modeling. For less leak-prone assets, where the leak was caused, for example, by third party damage on modern plastic, repair can be an effective strategy for managing integrity as it addresses the existing leak. In that event the asset is unlikely to leak again based on age and material, so long as the remainder of the asset is

in good condition. For leak-prone assets like cast iron and bare steel, however, spot repairs do not prevent the asset from leaking again in the future and, as they impact only a small, local segment of the pipe and do not mitigate future risk or future leaks. Further, due to the disturbance of the local pipe environment required to conduct the repair and the additional stresses placed on the pipe by the repair clamp, repairing these materials can increase the probability that the repaired pipe will leak again. In that instance, replacement of the leak-prone asset is the only option that removes the potential for further future failures, addressing both the risk and potential methane emissions, over the lifetime of the replacement asset.

This is analogous to patching a relatively new tire to fix a puncture from a nail, versus trying to patch an old worn tire that failed due to wear out. In the first case you have a repaired tire likely to function well for some time. In the latter case you have a worn tire likely to fail again, potentially with significant impacts. The safest option is to replace the old, worn tire, with a new tire. By doing so, the risk from future failures is significantly reduced.

Further, an approach that only addresses active leaks within a distribution system would not meet the requirements of PHMSA regulations in that it does not "minimize the likelihood of a release as well as address the consequences of potential releases"[5]

V. JANA LIGHTHOUSE AIDS PROJECT PRIORITIZATION IN ALIGNMENT WITH THE DISTRICT'S CLIMATE GOALS

Q. DID ORDER NO. 22003 INCLUDE ANY DIRECTIVES RELATING TO JANA?

[5] Docket No. PHMSA-2024-0043

A. Yes. Paragraph 51.k in Order No. 22003 provides as follows:

> "Explain how JANA Lighthouse will aid in a project prioritization that aligns with the District's climate goals, including projections on GHG emission reductions and preventing leaks each year. This should include details on how JANA produces risk scores and risk rankings."

Q. PLEASE EXPLAIN HOW JANA LIGHTHOUSE PROVIDES FOR PROJECT PRIORITIZATION THAT ALIGNS WITH THE DISTRICT'S CLIMATE GOALS.

A. The JANA Lighthouse solution enables prioritization of both mitigated safety risk, as required by PHMSA regulations, and, based on the fact that future risk and future potential leaks are connected, avoids future methane emissions in alignment with the District's climate goals. This is inherent in the mechanistic model structure and the nature of pipeline loss of containment (*i.e.*, leak) failures. JANA Lighthouse provides mitigated risk scores for pipeline replacement projects (how much risk, on an annual basis, is removed by replacing the existing assets). These risk results are calculated for each asset in a project and summed to forecast the total risk removed by the project. The model sets are compliant with 49 CFR 192.1007, which outlines PHMSA's prescribed elements for an Integrity Management plan. They are also probabilistic, which is considered best practice by PHMSA.[6]

Q. HOW IS THIS ACHIEVED?

A. Risk for gas pipeline assets, as calculated within the JANA Lighthouse solution, is based on observed historical performance of pipeline systems. Risk is linked

[6] PHMSA: Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation, February 1, 2020.

directly to forecasted leak activity and the potential consequences of those forecasted leaks. Assets with more forecasted leaks will have higher risk than assets with fewer forecasted leaks. Location of the assets will also impact risk, based on proximity to dwellings and other similar considerations. The model assesses the potential consequences of leaks based on the likelihood of the leak and its location (*e.g.*, leaks occurring on assets in a business district would have higher potential consequences than the same leak occurring in a rural area). As leaks are directly tied to methane emissions, and assets that are the most leak-prone are identified by the models[7] as having greater risk, JANA's prioritization process is aligned with the District's climate goals in that it enables identification and removal of the most emission-prone (i.e., leak-prone) asset sub-populations in a targeted way (through providing asset specific forecasts and identifying those specific assets within the ARP eligible asset population with the highest potential for future leaks). These leak-prone assets can be further differentiated on the basis of risk removed to enable additional prioritization in alignment with PHMSA requirements to manage system risk. The best way to reduce methane emissions (and risk) is to avoid those emissions from occurring in the first place by removing the most leak-prone, highest risk assets before any additional leaks develop.

Q. ARE THE JANA MODELS ABLE TO IDENITFY THOSE ASSETS MOST LIKELY TO LEAK?

A. Our analysis shows us that this is true. For the top 15% of assets in the DC system projected by JANA Lighthouse to be the most leak-prone, the actual observed

[7] Multiple models are employed in the JANA solution as detailed in Section V: JANA Lighthouse Risk Modeling Methodology

leaks in 2022 in those assets were roughly 6 times (600%) the leak rate in the remaining 85% of assets. For the top 5% of assets in the DC system projected by JANA Lighthouse to be the most leak-prone, the actual observed leaks in 2022 in those assets were roughly 12 times (1200%) the leak rate in the remaining 95% of assets. This clearly demonstrates the power of the JANA Lighthouse solution to identify those assets within the overall asset population that are most likely to leak. The JANA models, therefore, identify the assets most likely to produce methane emissions in the future.

Q. HOW ACCURATE IS THE JANA LIGHTHOUSE SYSTEM AT IDENTIFYING ASSETS THAT ARE LIKELY TO LEAK?

A. The JANA Lighthouse leak forecasts, by threat, all fall within the 90% confidence limits of observed leaks through the 2017 – 2022 time period. The models project leaks with an accuracy of 94% for 2022 (comparing observed versus forecast leaks).

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

ATTESTATION

I, KENNETH OLIPHANT, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

KENNETH OLIPHANT

Sept 23, 2024

DATE

WITNESS LAWSON
EXHIBIT WG (F)

BEFORE THE
PUBLIC SERVICE COMMISSION OF THE
DISTRICT OF COLUMBIA

IN THE MATTER OF THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PLAN	FORMAL CASE NO.1179

WASHINGTON GAS LIGHT COMPANY
District of Columbia

DIRECT TESTIMONY OF R. ANDREW LAWSON
Exhibit WG (F)
(Page 1 of 1)

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Exhibits

EXHIBIT WG (F)

WASHINGTON GAS LIGHT COMPANY

DISTRICT OF COLUMBIA

DIRECT TESTIMONY OF R. ANDREW LAWSON

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is R. Andrew Lawson. I am employed as Manager of Regulatory Affairs at Washington Gas Light Company ("Washington Gas" or "Company"), 6801 Industrial Road, Springfield, Virginia, 22151.

I. QUALIFICATIONS

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I joined Washington Gas in 2006, and have been in my current role as Manager of Regulatory Affairs since January 2022. In my current capacity, I manage the Company's regulatory activities in each of its three jurisdictions. Prior to my employment with Washington Gas, I was a Regulatory Economist in 2004 with the Technical Staff of the Public Service Commission of Maryland. During my time at Washington Gas, in addition to working in Regulatory Affairs, I also have worked in the Rates Department and as Project Manager – Strategic Initiatives in the Company's Sales and Economic Development Department. I received a Bachelor of Science degree in Economics from Mary Washington College in Fredericksburg, Virginia.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA ("COMMISSION") OR ANY OTHER STATE COMMISSION?

A. I have sponsored testimony before the Commission in Formal Case Nos. 1137, 1154, 1162, 1169 and 1175. I have sponsored testimony before the Virginia State Corporation Commission and in multiple cases before the Maryland Public Service Commission concerning various electric, gas, and water issues during my employment with the Maryland Public Service Commission and on behalf of the Company in Formal Case No. 9708.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support the Company's request for continuation of the Accelerated Pipe Replacement Program ("APRP") Adjustment as described in General Service Provision ("GSP") No. 28 – Accelerated Pipe Replacement Program (APRP) Adjustment. As directed by the Commission in Order No. 22003, I will discuss why it is appropriate to continue the APRP Adjustment for the new, targeted District of Columbia Strategic Accelerated Facilities Enhancement ("DISTRICT SAFE") program.

Additionally, I explain the purpose of the APRP Adjustment, which is to recover eligible infrastructure replacement costs consistent with the Unanimous Agreement of Stipulation and Full Settlement approved in Formal Case No. 1115)[1] and the Commission's Order for the second phase of the Company's

[1] Formal Case No. 1115, *In the Matter of the Application of Washington Gas Light Company for Approval of a Revised Accelerated Pipe Replacement Program,* Joint Motion for Approval of Unanimous Agreement of Stipulation and Full Settlement filed December 10, 2014.

PROJECT*pipes* Plan ("PIPES 2"). I will explain how the Current Factor for the APRP Adjustment is calculated and implemented.

III. IDENTIFICATION OF EXHIBITS

Q. **DO YOU SPONSOR ANY EXHIBITS IN YOUR TESTIMONY?**

A. Yes. I sponsor two (2) exhibits. Exhibit WG (F)-1 provides the preliminary bill impact calculations for proposed expenditures for DISTRICT SAFE Program Years 1 through 3. Exhibit WG(F)-2 provides revisions to GSP No. 28 – APRP Adjustment to provide for the recovery of Operations & Maintenance expenses related to the development and certified mailing of a notice to customers that their service line has been identified for replacement, thereby giving customers the option to electrify before their service is replaced. This proposal is discussed in further detail by Company Witness Rogers.

IV. NEED FOR THE ACCELERATED COST RECOVERY

Q. WHY IS AN ACCELERATED RECOVERY MECHANISM APPROPRIATE FOR THIS PROGRAM?

A. As described by Witness Quarterman in her testimony, accelerated replacement activity reflects a level of investment that, by its very nature, exceeds the traditional betterment programs undertaken by utilities that are the subject of traditional base rate cost recovery. Accelerated programs reflect a level of investment, and a pace of investment, that is many times greater than what utilities, including Washington Gas, were doing prior to the issuance of the U.S. Pipeline and Hazardous Materials Safety Administration's ("PHMSA") Call to Action. Ensuring a steady flow of cost recovery as part of such an intense

outlay of capital is critical to the financial health of the Company so that it can continue safety work unabated while meeting all of the other functions that are subject to normal cost recovery through base rates.

Q. WHAT IS THE ALTERNATIVE TO RECOVERY OF ACCELERATED PIPE REPLACEMENT PROGRAM COSTS THROUGH A SURCHARGE?

A. The only other cost recovery option currently available to the Company in the District is through the normal base rate case process.

Q. IS THE EXISTING BASE RATE CASE PROCESS A VIABLE OPTION FOR RECOVERY OF COSTS ASSOCIATED WITH ACCELERATED REPLACEMENT ACTIVITY?

A. No. As the Commission is well aware, based on its Notice of Inquiry issued last year,[2] the existing base rate case process is lengthy, and delays cost recovery for years after plant is placed in service. There are multiple roadblocks in the rate case process that erode the Company's opportunity to recover its capital costs on a timely basis, including the length of time required to litigate a base rate case in the District, the Commission's policy to deny recovery of Construction Work in Progress ("CWIP") in base rates (except under very limited circumstances), and the Commission's policy that denies any post-test year adjustments to plant.

One of the primary roadblocks to the timely recovery of costs for capital expenditures is that litigation of a rate case in the District is a lengthy process. The time that lapses between when the Company incurs a cost and when it begins recovering those costs through rates is often several years apart. In the Company's most recently decided rate case (Formal Case No. 1169 or

[2] GD 2023-02-M, Notice of Inquiry (July 27, 2023).

"FC1169") filed on April 4, 2022, the test year in the proceeding was the twelve months ended December 31, 2021. The Company received new rates from FC1169 on January 16, 2024, meaning that the Company did not receive cost recovery for any capital costs incurred in January 2021 until three years after those costs were incurred. At best, capital costs incurred at the end of the test year (December 2021) began recovery after a lag of two full years. This regulatory lag is some of the longest in the country.

Exacerbating the issue discussed above is the Commission's policy to deny the Company recovery of CWIP in base rates. Again, using FC1169, any capital costs not included for accelerated replacement that were incurred during the test year, but which were not placed into service prior to the end of December 2021, are still being absorbed by the Company today and will be until the conclusion of the Company's next base rate case. The majority of jurisdictions in the United States allow either some form of a future test year or allow recovery of CWIP.

Finally, these two factors could be somewhat, but not fully, alleviated by the use of post-test year adjustments that bring plant up to date throughout the litigation of a case. However, the Commission has not accepted post-test year adjustments for known and measurable plant for Washington Gas. Even if the Commission were to remedy these issues in the Company's next base rate case, the scale of the work being done requires a cost recovery process that is not 'business as usual.'

Q. HOW WOULD THE COMPANY FUND THIS REPLACEMENT WORK WITHOUT THE APRP ADJUSMTENT?

A. At this point, that is unclear. The Company demonstrated in Formal Case No. 1169 that the inability to recover costs on a timely basis has created, and continues to create, challenges for the Company, even with an accelerated recovery mechanism for PROJECT*pipes*. As a result, the Company has experienced a significant earnings deficiency over the entirety of the last decade and remains in a severe under-earning position today. Without ongoing accelerated cost recovery, the Company will have no reasonable opportunity to earn a fair rate of return on its investment.

The surcharge mechanism remains the appropriate mechanism for recovering costs for the Company's accelerated pipe replacement activities. The traditional, historical test year base rate process is simply not conducive to fair treatment of a large construction program.

Q. WHAT CAN YOU INFER FROM THE COMMISSION'S REQUEST REGARDING THE NEED FOR A SURCHARGE?

A. The requirement to "Explain and demonstrate the need for a surcharge recovery mechanism for the new restructured pipe replacement program"[3] is accompanied by a footnote that reads:

> *It is noted that prior to receiving surcharge recovery for pipe replacement, the Company replaced more miles of main, at a lower cost, using their capital expenditure budget. See Formal Case No. 1154, Notice of Commissioner Beverly, filed January 8, 2024.*[4]

[3] Formal Case No. 1154, Formal Case No. 1175 and Formal Case No. 1179, Order No. 22003, Page 20, Paragraph 51, Part o., June 12, 2024.
[4] *Id.*

The implication in this statement is not entirely clear, but it can be reasonably interpreted to imply that Washington Gas would have or will continue the same level of replacement activity with or without the timely recovery afforded by the APRP Adjustment. While the Company has addressed the multitude of factors that have caused the increase in cost to replace its facilities in the District[5] (and does so again in its testimony in this proceeding), the increase in cost to perform work in the District reinforces the need for surcharge recovery rather than diminishes it. The increase in the cost to perform work, combined with chronic earnings deficiencies, places the Company in an unsustainable position to fund the needed work.

Q. WHAT OPTIONS ARE AVAILABLE TO THE COMPANY FOR FUNDING NEEDED REPLACEMENT WORK ABSENT TIMELY RECOVERY?

A. The most likely outcome of denial of timely cost recovery is annual base rate filings. This approach would be administratively burdensome, inefficient, and costly to customers. It would expose customers to dramatically increased costs for litigating base rates cases. Annual rate cases will also expose customers to the reality of absorbing cost increases not related to accelerated replacement sooner than they otherwise would. With less frequent base rate cases, the Company absorbs these costs for a longer period of time. Simply put, it is inappropriate to conclude that District customers will experience lower bills in the absence of timely recovery of DISTRICT SAFE costs.

[5] *See* Formal Case No. 1154, Washington Gas Response to Notice of Commissioner Beverly, January 17, 2024.

Q. HOW WOULD ELIMINATION OF ACCELERATED COST RECOVERY FOR VINTAGE FACILITIES POSITION THE DISTRICT COMPARED TO OTHER JURISDICTIONS?

A. Currently, 41 states and the District of Columbia have accelerated replacement programs or programs supportive of accelerated pipe replacement. Elimination of appropriate funding of that accelerated replacement would position the District as an outlier around the country.

Q. PLEASE EXPLAIN THE COMPANY'S DISTRICT SAFE COST RECOVERY PROPOSAL.

A. Based on the foregoing, it is necessary to continue the APRP Adjustment, previously used to recover costs for the Company's PROJECT*pipes* plans, to recover costs for DISTRICT SAFE. Below, I explain how the APRP Adjustment is calculated and implemented. I will also provide an estimate of the revenue requirement associated with the expenditures included in DISTRICT SAFE.

V. APRP ADJUSTMENT MECHANISM

Q. PLEASE DESCRIBE THE APRP ADJUSTMENT.

A. The APRP Adjustment is a billing adjustment computed on an annual basis that creates a volumetric charge to be billed to customers on a monthly basis. The APRP Adjustment is shown as a separate line item on customers' bills.

Q. IS THE COMPANY PROPOSING ANY CHANGES TO THE WAY IN WHICH IT CALCULATES THE SURCHARGE?

A. Yes, but the Company is proposing only one minor change. Generally speaking, the Company intends to maintain the same cost recovery structure for

DISTRICT SAFE that is currently in place for PROJECT*pipes*. The current surcharge has been successful in ensuring accurate and timely cost recovery.

However, as described in the Direct Testimony of Company Witness Rogers, the Company proposes to develop and send via certified mail, a notification to customers that their service line has been identified for replacement, thereby affording the customer the opportunity electrify their premise and abandon service prior to replacement.

Q. HOW IS THE APRP ADJUSTMENT DETERMINED?

A. The APRP Adjustment is determined by conducting a series of calculations and using a cost-of-service methodology utilized in Company rate cases. First, as shown in the DISTRICT SAFE Plan, the Company has determined an annual level of facility replacement costs for eligible infrastructure replacements. Each year of DISTRICT SAFE, the Company will incur costs over a 12-month period. The estimated level of capital costs incurred for each plan year is as follows:

Year	Budget
2025[6]	$50,000,000
2026	$55,500,000
2027	$65,000,000
Total	**$170,500,000**

This annual level of plant will be converted to an average rate base amount before calculating the costs to be included in the surcharge. In addition, the average rate base will be reduced for Reserve for Depreciation and Accumulated

[6] DISTRICT SAFE CY 2025 covers 10 months of work and expenditures from March 2025 to December 2025.

Deferred Income Taxes, as shown on Exhibit WG (F)-1, Page 2. The resulting computation serves as the basis upon which the Company proposes to compute the return on investment described further below.

Q. PLEASE DESCRIBE THE ELEMENTS OF THE SURCHARGE.

A. Each of the elements to be included in the APRP Adjustment is discussed below:

1) Return on the Investment - The Company will apply the cost of capital as determined in the Company's most recently decided base rate case (currently Formal Case No. 1169) to the average level of plant expenditures, as adjusted for the Reserve for Depreciation and Accumulated Deferred Income Taxes, to calculate a return on the plant. The Return on Investment for the twelve-month period is calculated by converting Annual Return on Investment to a monthly basis (7.11% divided by 12) and applying that monthly return to the net rate base amount calculated above on a monthly basis. The sum of these monthly returns provides the Return on Investment for the twelve-month period.

2) Revenue Conversion Factor - A Revenue Conversion factor, including an allowance for income taxes and bad debt expense, will be applied to the eligible infrastructure replacement costs. The Revenue Conversion factor is based on the level of bad debt expense reflected in the Company's most recently decided base rate case (currently Formal Case No. 1169).

3) Depreciation - The Company will calculate a return on the eligible infrastructure replacement plant by using currently approved depreciation rates from the most recent depreciation study and applying those rates to

the expected average plant balance during the year, net of retired plant, to capture depreciation costs for the period. This calculation is shown on Exhibit WG (F)-1, Page 4.

4) Operations & Maintenance Expense – The Company will track and include the level of O&M expense incurred for the development and certified mailing of notification to customers that their service line has been identified for replacement, thereby affording the customer the opportunity electrify their premise and abandon service prior to replacement.

5) Carrying Costs - Carrying costs on the over-or-under recovery of the actual eligible infrastructure replacement costs will be calculated at the end of each twelve-month period. The calculation will determine the amount over- or under-recovered at the end of each month. Each monthly amount will apply the over- or under-recovery to the cost of capital.

In the final step, the total calculated eligible infrastructure replacement cost is divided by estimated throughput to arrive at a “per therm” factor by customer class, which is then multiplied by the actual customer usage and included in the separate customer bill line item shown on bills. Because the initial period of DISTRICT SAFE covers the period March-December 2025, I will calculate a proposed revenue requirement for that period based on the calculations above, but over a ten-month period. Future plan years will return to calculation of revenue requirements on a twelve-month basis.

Q. PLEASE EXPLAIN THE "CURRENT FACTOR" AND "FINANCIAL RECONCILIATION FACTOR" THAT ARE SHOWN IN GENERAL SERVICE PROVISION (“GSP”) NO. 28.

A. The Current Factor is an annual factor applied to customer usage that collects the expected costs over a twelve-month calendar period ending in December. The Reconciliation Factor is calculated by comparing the actual collections of the Current Factor to the actual eligible infrastructure replacement costs incurred. A Reconciliation Factor will be computed at the conclusion of each annual Plan Year by comparing actual collections of the current factor through the APRP Adjustment with actual eligible infrastructure replacement costs. The calculated amount of under- or over-collection will be divided by the current estimated annual throughput to create the Reconciliation Factor to be added to or subtracted from the Current Factor.

Q. PLEASE EXPLAIN HOW THE ALLOCATION OF PLANT REPLACEMENT COSTS TO CUSTOMER RATE SCHEDULES IS ACCOMPLISHED.

A. As shown on Exhibit WG (F)-1, Page 1, plant replacement costs are allocated based on each class's percentage of distribution revenues in Formal Case No. 1169 (Exhibit WG (F)-1, Page 10).

Q. PLEASE EXPLAIN WHAT IS SHOWN IN EXHIBIT WG (F)-1.

A. Exhibit WG (F)-1, Page 1, provides an estimate of the APRP Adjustment impact for the initial period of DISTRICT SAFE, from March-December 2025 based on the Company's proposal in this proceeding. Exhibit WG (F)-1, Page 11 provides the average bill impact for customer classes for the following two years.

Q. PLEASE EXPLAIN WHAT IS SHOWN IN EXHIBIT WG (F)-2.

A. Exhibit WG (F)-2, provides the Company's proposed tariff changes to include in the APRP Adjustment, O&M expense incurred for the development and certified mailing of notification to customers that their service line has been

identified for replacement, thereby affording the customer the opportunity to electrify their premise and abandon service prior to replacement.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

WASHINGTON GAS LIGHT COMPANY - DISTRICT OF COLUMBIA
EXAMPLE CALCULATION OF APRP ADJUSTMENT
MARCH-DECEMBER 2025

Formal Case 1179
Exhibit WG(F)-1

Line No.	Description				Feb 2025- Mar 2026
1	Average Rate Base (Page 2)			$	19,754,686
2	Rate of Return on Investment (Pages 2 and 3)			$	1,169,691
3	Revenue Conversion Factor (Page 6)	Ln 2 * 1.415313		$	1,655,479
4	Depreciation (Pages 4 and 7)			$	490,235
5	Interest Synchronization (Page 7)			$	(160,589)
6	Customer Notifcation Costs				n/a
7	Carrying Cost a/				n/a
8	TOTAL COSTS	Lines 3+4+5+6+7			$1,985,125
9	ALLOCATION b/		%		
10	Residential		52.33%		$1,235,343
11	Commercial & Industrial		27.85%		$411,715
12	Group-Metered Apartments		12.47%		$164,964
13	Interruptible		7.35%		$173,103
			100.00%		$1,985,125
14	MARCH-DECEMBER 2025 NORMAL WEATHER THERMS c/				
15	Residential				58,175,699
16	Commercial & Industrial				51,626,742
17	Group-Metered Apartments				23,246,368
18	Interruptible				61,521,043
					194,569,853
19	CURRENT FACTOR				
20	Residential			$	0.0212
21	Commercial & Industrial			$	0.0080
22	Group-Metered Apartments			$	0.0071
23	Interruptible			$	0.0028

ESTIMATED AVERAGE INCREMENTAL BILL IMPACT FOR DC SAFE

	Class	Estimated Usage Mar-Dec 2025		Mar-Dec 2025
24	Residential Heating	535	$	11.36
25	Residential Non-Heating - Other	388	$	8.24
26	Residential Non-Heating - IMA	53	$	1.13
27	Commercial & Industrial < 3,075	915	$	7.30
28	Commercial & Industrial > 3,075	14,909	$	118.90
29	Commercial & Industrial NHNC	3,324	$	26.51
30	Group-Metered Apartment <3,075	1,297	$	9.20
31	Group-Metered Apartment >3,075	13,849	$	98.28
32	Group-Metered Apartment NHNC	3,938	$	27.95
33	Interruptible	284,856	$	801.50
34	Combined Heat and Power	2,127,457	$	16,966.12

a/ Amount to be determined when annual reconciliation performed
b/ Based on percentage of revenues resulting from Formal Case No. 1169.
c/ Based on normal weather therms as decided in Formal Case 1169.(Page 7 of 10)

	Distribution Services A	Distribution Mains B	Total D	Cummulative E	Depreciation Reserve G	Accuumulated Deferred Income Tax H	Net Rate Base I	Return On Net Rate Base J	Revenue Conversion Factor K
Mar-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$ 5,000,000	$ 8,689	$ (1,373,484)	$ 3,617,827	$ 21,421	$ 30,318
Apr-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$10,000,000	$ 26,066	$ (2,746,968)	$ 7,226,966	$ 42,791	$ 60,563
May-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$15,000,000	$ 52,132	$ (4,120,452)	$ 10,827,415	$ 64,110	$ 90,736
Jun-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$20,000,000	$ 86,887	$ (5,493,936)	$ 14,419,176	$ 85,377	$ 120,835
Jul-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$25,000,000	$ 130,331	$ (6,867,420)	$ 18,002,249	$ 106,593	$ 150,862
Aug-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$30,000,000	$ 182,463	$ (8,240,904)	$ 21,576,632	$ 127,757	$ 180,816
Sep-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$35,000,000	$ 243,284	$ (9,614,389)	$ 25,142,327	$ 148,870	$ 210,697
Oct-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$40,000,000	$ 312,794	$ (10,987,873)	$ 28,699,333	$ 169,931	$ 240,506
Nov-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$45,000,000	$ 390,993	$ (12,361,357)	$ 32,247,651	$ 190,941	$ 270,241
Dec-25	$ 2,000,000	$ 3,000,000	$ 5,000,000	$50,000,000	$ 477,880	$ (13,734,841)	$ 35,787,279	$ 211,899	$ 299,904
	$ 20,000,000	$ 30,000,000	$50,000,000		$ 127,435	$ (9,442,703)		$ 1,169,691	$ 1,655,479

Formal Case No. 1169

Twelve Months Ended December 31, 2021

Description	Capital Structure Ratio	Cost	Weighted Cost	Taxes a/	Pretax Return Taxes
A	B	C	D = B x C		
Long-Term Debt	43.00%	4.36%	1.875%	100.000%	1.87%
ShortTerm Debt	5.00%	4.25%	0.213%	100.000%	0.21%
Common Equity	52.00%	9.65%	5.018%	72.480%	6.92%
Total	100.00%		7.11%		9.01%

DC Income Tax Rate	8.25%
Federal Income Tax Rate (Net of Stat	19.27%
Composite Tax Rate	27.52%
Reciprocal (1-Composite Tax Rate)	72.48%

Source: Stipulation and Settlement Agreement filed 12-8-2020, Attachment 3

	PLANT EXPENDITURES			DEPRECIATION EXPENSE					
	Distribution Services	Distribution Mains	Total Plant	Distribution Services	Distribution Mains	Total Depr. Exp. b/	Monthly Depreciation	Accumulated Depreciation	Deferred Income tax
	A	B	D	E	F	G	G	I	J
Depreciation Rates a/				2.40%	2.07%				
Mar-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$8,689	$8,689	$ (1,373,484)
Apr-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$17,377	$ 26,066	$ (2,746,968)
May-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$26,066	$ 52,132	$ (4,120,452)
Jun-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$34,755	$ 86,887	$ (5,493,936)
Jul-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$43,444	$ 130,331	$ (6,867,420)
Aug-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$52,132	$ 182,463	$ (8,240,904)
Sep-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$60,821	$ 243,284	$ (9,614,389)
Oct-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$69,510	$ 312,794	$ (10,987,873)
Nov-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$78,199	$ 390,993	$ (12,361,357)
Dec-25	$2,000,000	$3,000,000	$5,000,000	$4,000	$5,175	$8,689	$86,887	$ 477,880	$ (13,734,841)
	$20,000,000	$30,000,000	$50,000,000			$86,887	$477,880		

a/ Based on Commission rates approved in Formal Case No. 1137.
b/ Total Depreciation has been reduced by 5.3% to reflect the cost of retired plant
c/ Plant in Service estimated at 83% of total expenditure

WASHINGTON GAS LIGHT COMPANY - DISTRICT OF COLUMBIA
REVENUE CONVERSION FACTOR

Ln. No.	Description	Reference	Amount
A	B	C	D
1	State Tax Rate	Statutory	8.250%
2	Federal Tax Rate	Statutory	21.00%
3	Federal Tax Rate Net of State Taxes	=Ln. No. 2*(1-Ln. No.1)	19.27%
4	Composite Tax Rate	=Ln. No.1 + 3	27.518%
5	Compliment of Composite Tax Rate	=1-Ln. No.4	72.483%
6	Revenue Gross Up, Excluding Uncollectible Accounts	=1/Ln. No.5	1.379643
7	Uncollectible Rate	Formal Case 1169 1/	2.5854%
8	Uncollectible Conversion Factor	=Ln. No.6 X Ln.No. 7	0.035669
9	Revenue Conversation Factor	=Ln No.6 + 8	1.415313

1/ Formal Case 1169 Exhibit WG (D)-5, Adjustment No. 1 & No. 6 - Workpaper No. 2

CALCULATION OF INTEREST SYNCHRONIZATION

			Mar - Dec 25
1	**Rate Base**	$	19,754,686
2	**Debt Return %**		2.09%
3	**Line 1 *Line 2**	$	412,340
4	**Tax Rate**		27.518%
5	**Line 3 * Line 4**	$	113,466
6	**Revenue Conversion Factor**		1.415313
7	**Line 5 * Line 6**		($160,589)

CALCULATION OF DEPRECIATION w/ REVENUE CONVERSION FACTOR

			Mar - Dec 25
8	**Depreciation Amount (Page 3)**	$	477,880
9	**Tax Rate Compliment**		0.72483
10	**Line 8 * Line 9**	$	346,379
11	**Revenue Conversion Factor**		1.415313
12	**Line 10 * Line 11**	$	490,235

WASHINGTON GAS LIGHT COMPANY - DISTRICT OF COLUMBIA
NORMAL WEATHER THERMS FROM FORMAL CASE 1169

Line No.	Description	January-21	February-21	March-21	April-21	May-21	June-21	July-21	August-21	September-21	October-21	November-21	December-21	Total
1	**Residential**													
2	Residenital Heating & Cooling	18,555,211	17,023,896	14,304,509	10,407,015	4,785,708	1,950,017	1,159,068	1,175,714	1,214,611	2,322,376	6,751,378	12,432,006	92,081,508
3	Residential NH/NC - Individually Metered Apartments	114,579	103,210	91,958	74,934	49,354	36,244	32,859	33,174	33,585	39,008	60,370	87,850	757,125
4	Residential NH/NC - Other	332,868	308,075	262,569	196,114	99,725	50,524	36,704	36,813	36,335	55,039	130,821	229,318	1,774,904
5	Total Residential	19,002,657	17,435,181	14,659,036	10,678,063	4,934,787	2,036,786	1,228,630	1,245,701	1,284,531	2,416,423	6,942,569	12,749,174	94,613,537
														-
6	**Commercial & Industrial**													
7	Commercial & Industrial Heating/Cooling - < 3,075 therms	1,061,937	976,593	813,993	578,725	246,040	83,230	39,688	43,225	47,839	114,955	376,465	711,665	5,094,354
8	Commercial & Indsutrial Heating/Cooling - > 3,075 therms	10,490,123	9,662,467	8,396,135	6,593,797	3,916,650	2,229,691	1,832,947	1,835,134	1,847,846	2,387,399	4,566,088	7,327,573	61,085,850
9	Commercial & Industrial Non-Heating/Non-Cooling	1,161,301	1,111,549	1,014,950	875,422	666,363	378,491	352,111	355,768	359,512	405,713	580,719	802,913	8,064,812
10	Commercial & Industrial - Combined Heat & Power	404,233	378,431	332,675	266,621	170,637	122,128	108,367	108,367	108,711	127,289	202,287	298,616	2,628,360
11	Total Commercial & Industrial	13,117,594	12,129,039	10,557,752	8,314,564	4,999,689	2,813,540	2,333,114	2,342,494	2,363,908	3,035,356	5,725,559	9,140,766	76,873,376
12	**Group Metered Apartments**													
13	Group Metered Apartments - Heating/Cooling < 3,075 Therms	143,107	134,430	114,994	87,172	48,980	50,720	44,955	45,560	45,097	52,410	81,466	121,813	970,706
14	Group Metered Apartments - Heating/Cooling > 3,075 Therms	5,327,216	4,929,997	4,242,813	3,231,126	1,736,097	987,151	775,133	772,435	778,637	1,065,587	2,227,352	3,705,575	29,779,119
15	Group Metered Apartments - Non-Heating/Non-Cooling	563,643	533,790	480,803	403,919	288,080	230,182	213,448	212,448	212,351	234,063	321,712	434,290	4,128,728
16	Total Residential	6,033,967	5,598,218	4,838,610	3,722,217	2,073,157	1,268,053	1,033,537	1,030,444	1,036,085	1,352,060	2,630,530	4,261,677	34,878,553
17	**Interruptible**													
18	Interruptible Delivery	6,205,819	5,899,690	5,227,988	4,291,047	3,013,764	2,388,223	2,231,525	2,214,360	2,201,970	2,459,859	3,500,969	4,838,174	44,473,389
19	Special Contracts	4,898,336	4,665,405	4,252,340	3,656,037	2,789,534	2,351,622	2,227,393	2,227,393	2,230,499	2,398,209	3,075,262	3,944,871	38,716,905
		11,104,155	10,565,095	9,480,328	7,947,084	5,803,298	4,739,846	4,458,919	4,441,753	4,432,470	4,858,069	6,576,232	8,783,046	83,190,293

E. Annual Depreciation Rates[1019]

FC 1137 Commission ORDER
Attachment 4-1(E)
Page 1 of 2

WASHINGTON GAS LIGHT COMPANY - DISTRICT OF COLUMBIA
Comparison of Current and SFAS 143 Accrual Rates
Current: VG Procedure / RL Technique
Updated: VG Procedure / RL Technique
Accretion Rate: 3.32 Percent

Statement A

Account Description	Current Investment	Current Net Salvage	Current Total	SFAS 143 Investment	SFAS 143 Net Salvage	SFAS 143 Total
A	B	C	D=B+C	E	F	G=E+F
STORAGE AND PROCESSING PLANT						
Allocated Property						
361.00 Structures and Improvements						
Maryland (Rockville)	2.76%	0.60%	3.64%	2.39%	0.76%	3.35%
Virginia (Ravensworth)	2.83%	0.51%	3.14%	2.47%	0.50%	2.97%
Total Account 361.00	2.80%	0.71%	3.49%	2.45%	0.83%	3.06%
362.00 Gas Holders						
Maryland (Rockville)	1.67%	0.50%	2.23%	1.69%	0.57%	2.26%
Virginia (Ravensworth)	1.75%	0.33%	2.08%	1.78%	0.34%	2.13%
Total Account 362.00	1.70%	0.48%	2.11%	1.73%	0.47%	2.20%
363.50 Other Equipment						
Maryland (Rockville)	2.60%		2.59%	6.30%	0.11%	6.48%
Virginia (Ravensworth)	-0.57%	6.19%	5.53%	1.97%	1.64%	3.51%
Total Account 363.50	2.09%	1.46%	3.61%	4.55%	0.88%	5.00%
Total Allocated Property	1.87%	0.57%	2.44%	2.02%	0.50%	2.52%
Total Storage and Processing Plant	1.87%	0.57%	2.44%	2.02%	0.50%	2.52%
TRANSMISSION PLANT						
Assigned Property						
365.20 Rights of Way						
366.00 Meas. and Reg. Station Structures						
367.10 Mains - Steel	1.02%	0.15%	1.17%	0.50%	0.10%	0.60%
369.00 Measuring and Regulating Equipment	1.91%	0.21%	2.12%	1.09%	0.20%	1.29%
Total Assigned Property	1.50%	0.18%	1.68%	0.82%	0.15%	0.97%
Allocated Property						
365.20 Rights of Way						
District	1.76%		1.76%	0.33%		0.33%
Maryland	1.68%		1.68%	1.60%		1.60%
Virginia	1.29%		1.29%	1.16%		1.16%
Total Account 365.20	1.55%		1.55%	1.36%		1.49%
366.00 Meas. and Reg. Station Structures						
Maryland	1.98%		1.98%	0.33%	1.24%	1.57%
Virginia	2.04%	0.20%	2.24%	1.33%	0.01%	1.33%
Total Account 366.00	2.01%	0.12%	2.13%	1.00%	0.21%	1.44%
367.10 Mains - Steel						
District	0.98%	0.15%	1.13%	1.05%	0.10%	1.15%
Maryland	1.56%		1.56%	1.44%	-0.03%	1.41%
Virginia	1.54%	0.25%	1.79%	1.47%	0.32%	1.79%
Total Account 367.10	1.50%	0.11%	1.61%	1.42%	0.03%	1.45%
369.00 Measuring and Regulating Equipment						
District	1.57%	0.21%	1.88%	-0.18%	0.20%	0.02%
Maryland	1.92%	0.29%	2.21%	0.29%	2.40%	2.69%
Virginia	1.91%	0.48%	2.39%	0.60%		0.60%
Total Account 369.00	1.82%	0.35%	2.17%	0.36%	1.66%	2.02%
Total Allocated Property	1.83%	0.18%	1.91%	1.07%	0.56%	1.63%
Total Transmission Plant	1.81%	0.15%	1.72%	1.03%	0.50%	1.53%
DISTRIBUTION PLANT						
Assigned Property						
375.00 Structures and Improvements						
376.10 Mains - Steel	1.28%	0.37%	1.65%	0.87%	0.39%	1.26%
376.20 Mains - Plastic	1.61%	0.46%	2.07%	1.53%	0.57%	2.10%
376.30 Mains - Cast Iron	0.47%	1.16%	1.63%	-1.78%	1.14%	-0.64%
376.40 Mains - Copper						
377.00 Compressor Station Equipment						
378.00 Measuring and Regulating Equipment	1.19%	0.11%	1.30%	1.08%	0.11%	1.19%
380.10 Services - Steel	1.57%	1.53%	3.10%	1.15%	0.91%	2.06%
380.20 Services - Plastic	1.52%	0.68%	2.20%	1.42%	0.73%	2.15%
380.30 Services - Copper	1.07%	1.40%	2.47%	-1.86%	1.46%	-0.40%

[1019] The following tables are from Commission Exhibit No. 9 (WGL's Response to Commission Data Requests, Question No. 4-1.)

Formal Case 1169
Compliance Filing
Attachment A
Page 1 of 1
Revised 1-9-2024

Washington Gas Light Company

Determination of Present and Proposed Revenue by Customer Class
Summary and Analysis of System Charge and Distribution Charge Revenue

Based on 12 Months Ended December 31, 2021 - Ratemaking

Line No.	Description	Reference	D.C. Amount	Residential			Commercial & Industrial				Group Metered Apartments			Interruptible	Special Contract
				Heating/Cooling	Non-htg IMA	Non-htg Other	Htg/Clg < 3,075	Htg/Clg > 3,075	CHP	Non-heating	Htg/Clg < 3,075	Htg/Clg > 3,075	Non-heating		
	A	B	C=D+...+N	D	E	F	G	H		I	J	K	L	M	N
1	**Customer Charge Revenue**														
2	Number of Bills	Normal Weather Study	1,969,194	1,630,163	139,471	43,887	51,833	39,962	12	24,289	7,099	20,665	10,248	1,529	36
3	Customer Charge per Bill	Tariff		**$ 15.05**	**$ 10.90**	**$ 12.30**	**$ 27.20**	**$ 63.70**	**$ 312.50**	**$ 25.90**	**$ 25.90**	**$ 63.70**	**$ 25.90**	**$ 110.00**	**$ 110.00**
4	Customer Charge Revenue	Line 2 x Line 3	$ 33,120,067	$ 24,533,953	$ 1,520,234	$ 539,810	$ 1,409,858	$ 2,545,579	$ 3,750	$ 629,085	$ 183,864	$ 1,316,361	$ 265,423	$ 168,190	$ 3,960
5	**Peak Usage Charge Revenue**														
6	Therms from Maximum Usage Month	Exhibit WG (O)-1	18,133,122	-	-	-	759,440	10,559,426	393,404	1,214,784	105,998	4,581,684	518,386	-	-
7	Peak Usage Charge per Therm	Tariff		**$ -**	**$ -**	**$ -**	**$ 0.0369**	**$ 0.0352**	**$ 0.0700**	**$ 0.0351**	**$ 0.0351**	**$ 0.0352**	**$ 0.0352**	**$ -**	**$ -**
8	Number of Months Billed (Nov-Apr)	6 months per Tariff		-	-	-	6	6	12	6	6	6	6	-	-
9	Peak Usage Charge Revenue	Line 6 x Line 7 x Line 8	$ 4,084,043	$ -	$ -	$ -	$ 168,140	$ 2,230,151	$ 330,460	$ 255,834	$ 22,323	$ 967,652	$ 109,483	$ -	$ -
10	**Distribution Charge Revenue**														
11	Total Normal Weather Therms - Throughput	Commission DR 3-8	289,555,759	92,081,508	757,125	1,774,904	5,094,354	61,085,850	2,628,360	8,064,812	970,706	29,779,119	4,128,728	44,473,389	38,716,905
12	Distribution Charge per Therm	Tariff		**0.4542**	**0.4076**	**0.4511**	**0.4135**	**0.4006**	**0.08**	**0.3993**	**0.4014**	**0.406**	**0.4027**		
13	Total Distribution Charge Revenues	=Line 11 * Line 12	87,083,342	41,823,421	308,604	800,659	2,106,515	24,470,992	210,269	3,220,280	389,641	12,090,322	1,662,639	-	-
14	**Total Tariff Rate Revenue**		124,287,452	66,357,374	1,828,838	1,340,469	3,684,513	29,246,722	544,479	4,105,199	595,828	14,374,335	2,037,545	168,190	3,960
15	Increase Allocated By Class	Attachment C	$ 24,009,913	12,526,804	345,244	388,429	1,067,664	5,521,134	157,774	774,971	112,479	2,713,556	384,643	16,819	396
16	**New Customer Charges**	=Line 3 *1.1(to nearest $0.05)		**$ 16.55**	**$ 12.00**	**$ 13.55**	**$ 29.90**	**$ 70.05**	**$ 343.75**	**$ 28.50**	**$ 28.50**	**$ 70.05**	**$ 28.50**	**$ 121.00**	**$ 121.00**
17	Increase Recovered Through System Charge	= (Line 16-Line 3) * Line 2	$ 3,296,145	$ 2,437,094	$ 153,418	$ 54,859	$ 139,949	$ 253,759	$ 375	$ 63,151	$ 18,457	$ 131,223	$ 26,645	$ 16,819	$ 396
18	Remainder of Increase Recovered Through Peak/Distribution Charges	= Line 15 - Line 16	$ 20,713,768	$ 10,089,710	$ 191,826	$ 333,570	$ 927,715	$ 5,267,375	$ 157,399	$ 711,819	$ 94,022	$ 2,582,334	$ 357,999	$ -	$ -
19	**Current Ratio (Peak Usage/)Distribution Revenue)**														
20	Peak Usage	=Line 9/(Line 9 + Line 13)	4.48%	0.00%	0.00%	0.00%	7.39%	8.35%	61.11%	7.36%	5.42%	7.41%	6.18%	0.00%	0.00%
21	Distribution Revenue	=1 - Line 20	95.52%	100.00%	100.00%	100.00%	92.61%	91.65%	38.89%	92.64%	94.58%	92.59%	93.82%	0.00%	0.00%
22	$ Increase to Peak Usage Charge Revenue	=Line 18 * Line 20	$ 875,676	$ -	$ -	$ -	$ 68,576	$ 439,945	$ 96,193	$ 52,388	$ 5,095	$ 191,362	$ 22,117	$ -	$ -
23	$ Increase to Disitribution Charge Revenue	= Line 18 - Line 22	$ 19,838,092	$ 10,089,710	$ 191,826	$ 333,570	$ 859,139	$ 4,827,430	$ 61,206	$ 659,431	$ 88,927	$ 2,390,972	$ 335,881	$ -	$ -
24	Total Peak Usage Revenue After Increase	= Line 9 + Line 22	$ 4,959,719	$ -	$ -	$ -	$ 236,716	$ 2,670,096	$ 426,653	$ 308,222	$ 27,418	$ 1,159,014	$ 131,600	$ -	$ -
25	Total Distribution Charge Revenue After Increase	= Line 13 + Line 23	$ 106,921,434	$ 51,913,131	$ 500,430	$ 1,134,229	$ 2,965,655	$ 29,298,421	$ 271,475	$ 3,879,711	$ 478,569	$ 14,481,294	$ 1,998,520	$ -	$ -
27	Peak Usage Charges After Increase	= Line 24/ (Line 6*Line 8)		**$ -**	**$ -**	**$ -**	**$ 0.0519**	**$ 0.0421**	**$ 0.0904**	**$ 0.0423**	**$ 0.0431**	**$ 0.0422**	**$ 0.0423**	**$ -**	**$ -**
28	Distribution Charges After Increase	= Line 25/Line 11		**$ 0.5638**	**$ 0.6610**	**$ 0.6390**	**$ 0.5821**	**$ 0.4796**	**$ 0.1033**	**$ 0.4811**	**$ 0.4930**	**$ 0.4863**	**$ 0.4841**	**$ -**	**$ -**

	Residential HC	Residential IMA	Residential Non-Oth	C&I <3,075	C&I>3,075	C&I NHNC	CHP	GMA<3,075	GMA>3,075	GMA NHNC	Interruptible a/	SC a/	Total
Current Revenue	$ 66,357,374	$ 1,828,838	$ 1,340,469	$ 3,684,513	$ 29,246,722	$ 4,105,199	$ 544,479	$ 595,828	$ 14,374,335	$ 2,037,545	$ 7,773,667	$ 1,843,659	$ 133,732,628
Revenue Increase	$ 12,526,804	$ 345,244	$ 388,429	$ 1,067,664	$ 5,521,134	$ 774,971	$ 157,774	$ 112,479	$ 2,713,556	$ 384,643	$ 1,486,197	$ 396	$ 25,479,291
Revenue After Increase	$ 78,884,178	$ 2,174,082	$ 1,728,898	$ 4,752,177	$ 34,767,856	$ 4,880,170	$ 702,253	$ 708,307	$ 17,087,891	$ 2,422,188	$ 9,259,864	$ 1,844,055	$ 159,211,919
Total NW Therms	92,081,508	757,125	1,774,904	5,094,354	61,085,850	8,064,812	2,628,360	970,706	29,779,119	4,128,728			206,365,466
% of Firm NW Therms	44.62%	0.37%	0.86%	2.47%	29.60%	3.91%	1.27%	0.47%	14.43%	2.00%			100%
Int Revenues Sharing	$ (3,644,329)	$ (29,965)	$ (70,246)	$ (201,620)	$ (2,417,608)	$ (319,183)	$ (104,023)	$ (38,418)	$ (1,178,574)	$ (163,404)			8,167,370
Net Revenues for Allocation	$ 75,239,849	$ 2,144,117	$ 1,658,652	$ 4,550,557	$ 32,350,248	$ 4,560,987	$ 598,230	$ 669,889	$ 15,909,317	$ 2,258,784	$ 9,259,864	$ 1,844,055	151,044,550
Percentage of Revenues	49.81%	1.42%	1.10%	3.01%	21.42%	3.02%	0.40%	0.44%	10.53%	1.50%	6.13%	1.22%	100%

a/ Revenues from 1-9-2024 Compliance Filing in Formal Case 1169- Attachments A&D

March 2026 - February 2028 DC SAFE Bill Impact Estimate

Line No.	Description			Jan-Dec 2026		Jan-Dec 2027
1	Rate Base (page 2)		$	62,306,947	$	120,158,988
2	Return on Plant	Line 1 * 7.11%	$	4,427,096	$	8,537,657
3	Revenue Conversion Factor	Line 2 * 1.415313	$	6,265,724	$	12,083,453
4	Depreciation a/		$	1,824,632	$	3,545,000
5	Interest Synchronization		$	(506,504)	$	(976,793)
6	Customer Notifcation Costs					
7	TOTAL COSTS		$	7,583,853	$	14,651,660
8	ALLOCATION a/	%				
9	Residential	52.33%	$	3,968,681	$	7,667,311
10	Commercial & Industrial	27.85%	$	2,111,808	$	4,079,917
11	Group-Metered Apartments	12.47%	$	945,844	$	1,827,327
12	Interruptible	7.35%	$	557,521	$	1,077,105
13		100.00%	$	7,583,853	$	14,651,660
14	NORMAL WEATHER THERMS					
15	Residential			58,175,699		58,175,699
16	Commercial & Industrial			51,626,742		51,626,742
17	Group-Metered Apartments			23,246,368		23,246,368
18	Interruptible			61,521,043		61,521,043
19	CURRENT FACTOR					
20	Residential		$	0.0682	$	0.1318
21	Commercial & Industrial		$	0.0409	$	0.0790
22	Group-Metered Apartments		$	0.0407	$	0.0786
23	Interruptible		$	0.0091	$	0.0175

ESTIMATED AVERAGE INCREMENTAL BILL IMPACT FOR DC SAFE

	Class	Avg Annual Usage		Jan-Dec 2026		Jan-Dec 2027
24	Residential Heating	678	$	46.25	$	89.36
25	Residential Non-Heating - Other	485	$	33.09	$	63.92
26	Residential Non-Heating - IMA	65	$	4.43	$	8.57
27	Commercial & Industrial < 3,075	1,179	$	48.23	$	93.17
28	Commercial & Industrial > 3,075	18,343	$	750.33	$	1,449.60
29	Commercial & Industrial NHNC	3,984	$	162.97	$	314.84
30	Group-Metered Apartment <3,075	1,641	$	66.77	$	128.99
31	Group-Metered Apartment >3,075	17,292	$	703.57	$	1,359.27
32	Group-Metered Apartment NHNC	4,835	$	196.73	$	380.06
33	Interruptible	349,039	$	3,163.09	$	6,110.94
34	Combined Heat and Power	2,628,360	$	107,513.86	$	207,711.92

WASHINGTON GAS LIGHT COMPANY - DISTRICT OF COLUMBIA
DC SAFE Estimated Revenue Requirements for January 2026 - December 2027

Formal Case 1179
Exhibit WG (F)-1
Workpaper 1

Plan Year	Capital			Reserve for Depreciation			Accumulated Deferred Income Tax			Rate Base	Rate Base
	Annual	Cumulative	Average	Annual	Cumulative	Average	Annual	Cumulative	Average	Average	EOP
Balances as of December 31,2025	$ 50,000,000	$ 50,000,000			$ 477,880			$ (13,734,841)			$ 35,787,279
January -December 2026	$ 75,000,000	$ 125,000,000	$ 87,500,000	$ 1,824,632	$ 2,302,512	$ 1,390,196	$ (20,136,032)	$ (33,870,873)	$ (23,802,857)	$ 62,306,947	$ 88,826,615
January -December 2027	$ 90,000,000	$ 215,000,000	$ 170,000,000	$ 3,545,000	$ 5,847,512	$ 4,075,012	$ (23,790,255)	$ (57,661,127)	$ (45,766,000)	$ 120,158,988	$ 151,491,361

WASHINGTON GAS LIGHT COMPANY
DISTRICT OF COLUMBIA
ANNUAL DEPRECIATION

Formal Case 1179
Exhibit WG (F)-1
Workpaper 2

	Services	Mains	Total	Annual Depreciation
Annual Depreciation Expense (As of 12/31/2025)				$1,042,647
January-December 2026 Forcasted Plant	$30,000,000	$45,000,000	$75,000,000	
Depreciation Rate	2.40%	2.07%	**2.09%**	
Annualized Depreciation a/	$681,840	$882,131	$1,563,971	$1,824,632
January-2027 Forcasted Plant	$36,000,000	$54,000,000	$90,000,000	
Depreciation Rate	2.40%	2.07%	**2.09%**	
Annualized Depreciation a/	$818,208	$1,058,557	$1,876,765	$3,545,000

a/ The amount has been reduced by 5.3% to reflect retired plant.

Retirement Pct. 5.30%

Formal Case 1179
Exhibit WG (F)-1
Workpaper 3

DC SAFE Budget

	Mar-Dec 2025	Jan-Dec 2026	Jan-Dec 2027	Total
Estimated Service Costs	$ 20,000,000	$ 30,000,000	$ 36,000,000	$ 86,000,000
Estimated Main Costs	$ 30,000,000	$ 45,000,000	$ 54,000,000	$ 129,000,000
TOTAL DC SAFE Capital Costs	$ 50,000,000	$ 75,000,000	$ 90,000,000	$ 215,000,000

Formal Case 1179

Exhibit WG (F)-2

Revised Tariff Pages - Legislative Version

GENERAL SERVICE PROVISIONS (continued)

28. ACCELERATED PIPE REPLACEMENT PLAN ADJUSTMENT (Continued)

6. Carrying costs on the over-or-under recovery of the eligible plant replacement costs will be calculated at the end of the twelve-month period. The calculation will determine the over-or-under recovered amount at the end of each month. Each monthly amount of the over-or-under recovery will be multiplied by the cost of capital.

7. Operations & Maintenance ("O&M") Expense related to the development and mailing of customer notices with an allowance for bad debt as determined in the Company's most recent base rate case.

~~7~~8. The total recovery amount as described in Sections III.A.1 through A.6 above will be divided by estimated throughput to arrive at a "per therm" factor by customer class multiplied by customer usage and included in the separate customer bill line item shown on bills.

B. Financial Reconciliation Factor

A reconciliation factor shall be computed at the conclusion of each annual period of the APRP Adjustment by comparing actual collections of the current factor through the APRP Adjustment with actual eligible infrastructure replacement costs. The calculated under-or-over collection shall be divided by the current estimated annual throughput to create the reconciliation factor to be added or subtracted from the current factor. Any adjustment to costs based upon the completed projects reconciliation shall be reflected in the next annual Financial Reconciliation Factor filing.

C. Completed Projects Reconciliation

On or before March 31st of each year of the Approved Plan, the Company shall file a Completed Projects Reconciliation Report, which will include estimated and actual spend for each APRP project completed during the prior Plan year (January 1 – December 31). Actual spend for each project shall be defined to include direct capital expenditures and project total capital expenditures, each of which shall be shown separately.

IV. FILING

The Company shall provide the Commission Staff, OPC, AOBA and other interested parties with a copy of the annual computation of the current APRP factor by October 31st of each year for implementation in the January billing cycle. The Financial Reconciliation Factor will be filed by March 31st of each year with implementation in the June billing cycle.

Formal Case 1179

Exhibit WG (F)-2

Revised Tariff Pages - Clean Version

GENERAL SERVICE PROVISIONS (continued)

28. ACCELERATED PIPE REPLACEMENT PLAN ADJUSTMENT (Continued)

6. Carrying costs on the over-or-under recovery of the eligible plant replacement costs will be calculated at the end of the twelve-month period. The calculation will determine the over-or-under recovered amount at the end of each month. Each monthly amount of the over-or-under recovery will be multiplied by the cost of capital.

7. Operations & Maintenance ("O&M") Expense related to the development and mailing of customer notices with an allowance for bad debt as determined in the Company's most recent base rate case.

8. The total recovery amount as described in Sections III.A.1 through A.6 above will be divided by estimated throughput to arrive at a "per therm" factor by customer class multiplied by customer usage and included in the separate customer bill line item shown on bills.

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A reconciliation factor shall be computed at the conclusion of each annual period of the APRP Adjustment by comparing actual collections of the current factor through the APRP Adjustment with actual eligible infrastructure replacement costs. The calculated under-or-over collection shall be divided by the current estimated annual throughput to create the reconciliation factor to be added or subtracted from the current factor. Any adjustment to costs based upon the completed projects reconciliation shall be reflected in the next annual Financial Reconciliation Factor filing.

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ATTESTATION

I, R. ANDREW LAWSON, whose Testimony accompanies this Attestation, state that such testimony was prepared by me or under my supervision; that I am familiar with the contents thereof; that the facts set forth therein are true and correct to the best of my knowledge, information and belief; and that I adopt the same as true and correct.

R. ANDREW LAWSON

9/25/2024
DATE

CERTIFICATE OF SERVICE

I, the undersigned counsel, hereby certify that on this 27th day of September 2024, I caused copies of the foregoing document to be hand-delivered, mailed, postage-prepaid, or electronically delivered to the following:

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