PAWC
QUALITY OF SERVICE INVESTIGATION

Executive Summary & Report

August 2025

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTLITY COMMISSION
HARRISBURG, PA

PAWC Quality of Service Investigation – Executive Summary
(August 2025)

Background

On November 8, 2023, Pennsylvania American Water Company (PAWC) filed a proposed base rate increase with the Pennsylvania Public Utility Commission (Commission) at Docket Nos. R-2023-3043189 and R-2023-3043190, seeking increases to its water and wastewater rates.

A total of 217 witnesses testified at the proceeding's public input hearings. The witnesses testified regarding a variety of topics, including affordability, quality of service, support for PAWC, and other miscellaneous topics. The public input hearing testimony revealed a trend in allegations of negative quality-of-service experiences due to a lack of water quality, particularly in the northeastern region of PAWC's service territory, which encompasses the Scranton and the greater Lackawanna County region. For instance, witnesses testified regarding dirty water, particles in the water, unpalatable water, and chlorine odor.

In addition, approximately 30 complaints and 50 publicly filed comments asserted negative quality-of-service issues with PAWC's water service. The complaints and comments also exhibited a trend in customer concerns regarding the quality of water service in PAWC's Northeastern Service Territory. For example, customers noted that the water was dirty with a chlorine odor, resulting in customers using water filters or bottled water.

Based upon the cumulative number of quality-of-service concerns raised in the proceeding via complaints, written comments, and testimony presented at the public input hearings, the Commission determined that further investigation was warranted to determine the cause of the quality-of-service issues and ensure that PAWC effectively addresses the issues raised in the proceeding.

On July 22, 2024, the Commission entered its final order on the rate case proceeding. In that final order the Commission directed its Staff to implement an investigation into the quality-of-service issues in PAWC's Northeastern Service Territory. The Commission specified that the investigation may involve conferencing with PAWC, issuing data requests, coordinating with the Pennsylvania Department of Environmental Protection (DEP), or any other action deemed necessary by Commission staff to explicate the quality-of-service issues.

Staff have concluded their initial investigation, which is attached to this overview.

Key Findings

Scranton Water System Chlorine Residual – PAWC's Scranton Water System exhibited higher-than average chlorine residual compared to its other systems.

The investigation observed that, due to the size and complexity of the Scranton Water system, PAWC maintains higher chlorine residual than other systems to ensure compliance with applicable Environmental Protection Agency (EPA) minimum residual disinfectant levels (MinRDL).

The investigation noted PAWC's construction of a new 3.5-million-gallon baffled water storage facility at the Lake Scranton Water Treatment Plant that will improve overall disinfection efficiency for the system.

Manganese Levels in the Northeast – PAWC's northeastern systems have exhibited manganese levels above secondary maximum containment levels (SCML) or Health Advisory Levels (HALs) established by the EPA. SCMLs are established to address the aesthetic considerations of the taste, color, and odor of water. HALs are established to protect the health of those consuming water.

Scranton Manganese SCML - Staff review of the Scranton Water System exhibited manganese metrics above EPA SCMLs. The investigation determined that the Scranton Water System manganese levels can be attributed to the turnover of Lake Scranton (detailed below). PAWC indicated that it recently invested $2.3 million into two new potassium permanganate bulk storage tanks that will provide greater process control related to manganese. Commission Staff review of the Manganese levels pre and post this construction shows a reduction in the average mg/L from 0.03 to 0.01.

Blue Mountain Lake Manganese HAL – PAWC recently observed groundwater sources in the Blue Mountain Lake system with manganese levels above the EPA SCML and HAL. PAWC stated that lower aquifer levels due to drought along with recent geological activity are a likely cause for these higher levels.

On March 27, 2025, PAWC completed the installation of a $2.6 million manganese removal system resulting in the levels dropping below HAL and SCML.

Montrose and Susquehanna Water Systems – Montrose has experienced seasonal variations in Manganese that exceeds SCML from time-to-time. The Susquehanna Water System is supplied from a source prone to rapid changes in raw water quality resulting in treatment challenges.

PAWC is in the process of redesigning the Montrose filter system to improve effectiveness. PAWC is also designing a new treatment plant for Susquehanna. In the interim, PAWC applied for a new treatment permit with DEP to improve manganese removal.

Lake Scranton Turnover – Turnover is caused by the rapid cooling and warming of water, causing water to change stratification, or layering, between top and bottom layers. This event can cause high concentrations of organics and metals like manganese and iron to rise to the surface.

The investigation shows that turnover may be one of the key causes for the brown, dirty, and discolored water complained about in the rate proceeding.

PAWC upgraded its chemical feed system at Lake Scranton, allowing it to more rapidly respond and improve water quality.

Main Breaks and Replacements – The investigation notes that water main breaks in the Scranton Water System are prone to affect significantly more customers than other main breaks in PAWC's northeast operations. This is the case since the Scranton System is PAWC's largest in its northeast service territory. As an example, the report highlights a significant main break occurrence on Septembers 28, 2023 resulting in four schools in the Scranton area closing for the day.

PAWC's infrastructure replacement program has exhibited rehabilitation to the Scranton System. In Fall of 2024 PAWC completed a project in the Scranton Water System replacing 28,851 feet of cast iron pipe of a vintage between 1868 and 1924. In February 2025, PAWC also began a project in Scranton and Dunmore involving the replacement of 30,000 feet of pipe dated between 1888 and 1964. PAWC also indicated that it intends to improve customer communication regarding infrastructure improvement to increase awareness of current and future projects.

<u>Next Steps</u>

Upon review of the Staff Report investigating PAWC's quality-of-service issues in the northeast, the Commission acknowledges that steps toward improvement are being made. However, this report is but one snapshot in time, and to ensure that these apparent improvements continue to result in improved quality-of-service, the Commission commits to continued monitoring of PAWC's Northeast Water System.

Continued Monitoring

This monitoring will entail the following. Commencing August of 2025, the Bureau of Technical Utility Service (TUS), with any necessary support from the Law Bureau, will obtain the following metrics every six months over the course of the next three years.

- Chlorine concentration for the Scranton System and all other applicable Northeast Water Systems of PAWC.
- Manganese concentration for the Scranton System and all other applicable Northeast Water Systems of PAWC.
- Information and observations regarding turnover events at Lake Scranton.
- Summaries of water main breaks on the Scranton Water System.

Touch Points with Concerned Customers

Further, the Commission commits to having personal communications with the various customers who raised issues at the underlying rate proceeding. The intent will be for the Commission to learn if the improvements observed at this initial investigation are manifesting tangible results at the customer taps. To that end, TUS, with any assistance necessary from Law Bureau or the Bureau of Consumer Services, will make personal contact with these customers periodically to ascertain their observations regarding PAWC's quality-of-service.

Reporting at this Docket

The results of Commission Staff's continued monitoring and touch points with customers will be documented in reports uploaded to this docket, Docket No. M-2024-3051789, every six months. Further, should Commission Staff believe these reports warrant further action by the Commission, Staff may take any reasonable actions necessary to ensure continued improvement, including referring the results of these monitoring actions and customer touch points to the Commission's Bureau of Investigation and Enforcement.

<u>Conclusion</u>

The Commission thanks all the customers of PAWC who helped inform the Commissioners of their quality of services issues which resulted in the decision to conduct this initial investigation. We encourage all customers of PAWC to continue corresponding with the Commission regarding all issues relating to their utility service, including but not limited to potentially utilizing the informal or formal complaint process.

The Commission thanks its Staff for their continued and dedicated work to ensure reasonable service for the customers of PAWC, and we thank PAWC for its cooperation in this investigation.

Root Cause Analysis Report on Investigation of Quality-of-Service Issues in Pennsylvania-American Water Company's Northeastern Service Territory

Docket No. M-2024-3051789

Prepared by the
Pennsylvania Public Utility Commission
Law Bureau and Bureau of Technical Utility Services

Dated: May 7, 2025

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I. PENNSYLVANIA-AMERICAN WATER COMPANY, ITS OPERATIONS, AND THE MATTER TO BE INVESTIGATED

The investigation that is the subject of this Root Cause Analysis Report stems from the Pennsylvania Public Utility Commission's (Commission) Opinion and Order, entered July 22, 2024, in Pennsylvania-American Water Company's (PAWC) general rate increase proceeding. *See Pa. Pub. Util. Comm'n, Office of Consumer Advocate, and Office of Small Business Advocate, et al. v. Pennsylvania-American Water Company*, Docket Nos. R-2023-3043189, *et al.* (Order entered July 22, 2024) (Order).

A. Pennsylvania-American Water Company

PAWC is a certificated public utility that provides water[1] and wastewater[2] service within the Commonwealth of Pennsylvania and is regulated by the Commission in accordance with the provisions of the Public Utility Code (Code). *See* 66 Pa.C.S. § 102. PAWC is a subsidiary of American Water Works Company, Inc. and is the largest regulated water and wastewater public utility in the Commonwealth. PAWC provides water and wastewater services to approximately 780,000 customers and its service territory spans a total of 37 Pennsylvania counties. Order at 4.

This investigation pertains only to PAWC's provision of water service and is limited to PAWC's water system facilities within the Pennsylvania Department of Environmental Protection's (DEP) northeast region, *i.e.*, PAWC's Northeastern Service Territory.[3] *Id.* at 13, 394. In its Northeastern Service Territory, PAWC operates 36 discrete water systems, each with their own operating characteristics and raw water quality. These systems include, but are not limited to, the Scranton Water System, the Blue Mountain Lakes Water System, the Berry Hollow Water System, the Hillcrest Water System, the Lehman Pike (Saw Creek) Water System, the Mid Monroe Water

[1] PAWC's water Utility Code is 212285.
[2] PAWC's wastewater Utility Code is 230073.
[3] The counties in this region include: Susquehanna, Wyoming, Lackawanna, Luzerne, Schuylkill, Carbon, Lehigh, Lackawanna, Wayne, Pike, Monroe, and Northampton County, Pennsylvania.

System, the Montrose Water System, and the Susquehanna Water System. PAWC's Scranton Water System is the largest in its Northeastern Service Territory and has a significant quantity of older cast iron water main.[4]

B. Relevant Procedural History

On November 8, 2023, PAWC filed Supplement No. 45 to Tariff Water – Pa. P.U.C. No. 5 and Supplement No. 47 to 5 Tariff Wastewater – Pa. P.U.C. No. 16 with the Commission, at Docket Nos. R-2023-3043189 and R-2023-3043190, seeking both an increase to its water and wastewater rates with the rate increases to become effective on January 7, 2024. On December 21, 2023, pursuant to Section 1308(d) of the Code, 66 Pa.C.S. § 1308(d), the Commission instituted a formal investigation to determine the lawfulness, justness, and reasonableness of PAWC's existing and proposed rates, rules, and regulations in the Tariff Supplments and suspended the Tariff Supplements, by operation of law, until August 7, 2024, unless otherwise directed by the Commission. *See* Order at 5-6.

PAWC's supporting financial data for the Tariff Supplements reflected an increase in total annual operating revenues of approximately $199.2 million for water service and $4.7 million for wastewater service, which were subsequently revised to approximately $189.9 million for water service and $3.5 million for wastewater service, respectively. PAWC noted that the rate increase was driven by the need: (1) to earn a fair return on investments, (2) to reflect capital additions placed into service since its last base rate proceeding and an estimated $1 billion in certain capital additions projected to be placed in service, including acquired troubled water utilities' distribution systems, and (3) to recover higher levels of operating and maintenance expenses resulting from increases in

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[4] As detailed in PAWC's current Long-Term Infrastructure Investment Plan (LTIIP), the vast majority of main breaks in PAWC's system occur on cast iron mains and replacement of cast iron mains is a priority for PAWC's LTIIP. *See* Docket No. P-2021-3028300.

production costs, employee-related expenses, and the cost of bringing high quality and reliable water service to additional communities in the Commonwealth. *Id.* at 4, 5, n.5.

The Commission's Bureau of Investigation and Enforcement (BI&E), the Office of Consumer Advocate (OCA), the Office of Small Business Advocate, the Coalition for Affordable Utility Services and Energy Efficiency in Pennsylvania, the Commission on Economic Opportunity, the Pennsylvania-American Water Large Users Group, the City of Scranton, Exeter Township, the Borough of St. Lawrence, Cleveland-Cliffs Steel, and Victory Brewing Company participated in the rate case litigation. A number of individuals also filed formal complaints in the proceeding or submitted public comments regarding the rate case. The rate case prompted significant interest from the public and several Pennsylvania State legislators. Accordingly, eight in-person public input hearings and four telephonic public input hearings were held. *Id.* at 5, 8.

A total of 217 witnesses testified at the public input hearings. The witnesses testified regarding a variety of topics, including affordability, quality of service, support for PAWC, and other miscellaneous topics. The public input hearing testimony revealed a trend in allegations of negative quality-of-service experiences due to a lack of water quality, particularly in the northeastern region of PAWC's service territory, which encompasses the Scranton, Pennsylvania and the greater Lackawanna County region. For instance, witnesses testified regarding dirty water, particles in the water, unpalatable water, and chlorine odor. *Id.* at 9-11.

In addition, approximately 30 *pro se* complaints and 50 publicly filed comments asserted negative quality-of-service issues with PAWC's water service. The complaints and comments also exhibited a trend in customer concerns regarding the quality of water service in PAWC's Northeastern Service Territory. For example, customers noted that the water was dirty with a chlorine odor, resulting in customers using water filters or bottled water. *Id.* at 11-13.

On May 7, 2024, following a fully-litigated proceeding, Deputy Chief Administrative Law Judge (ALJ) Christopher P. Pell and ALJ John M. Coogan issued a Recommended Decision (R.D.). The ALJs recommended that the Commission deny PAWC's rate increase as requested, but approve a maximum revenue increase of approximately $92.6 million for water service and $11.5 million for wastewater service. R.D. at 1, 392. With respect to the alleged quality-of-service issues, the ALJs noted that, while Section 1501 of the Public Utility Code, 66 Pa.C.S. § 1501, requires PAWC to provide customers with adequate and reasonable service, it does not require PAWC to provide perfect service. The ALJs also found that PAWC had adequate procedures in place to track and respond to customer complaints.[5] *Id.* at 364.

Several parties filed exceptions to the Recommended Decision on May 17, 2024, and several parties filed reply exceptions on May 22, 2024. Order at 7-8.

C. The Commission's July 22, 2024 Order

On July 22, 2024, the Commission entered an Order[6] addressing the parties' exceptions and reply exceptions and disposed of PAWC's rate case by approving an

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[5] In their Findings of Fact, the ALJs noted that PAWC:

> (1) analyzes every customer complaint it receives (other than informal mediation complaints that do not involve any allegation of wrongdoing by the Company), to determine the contributing factor, if any; (2) makes a root-cause determination for every such customer complaint; (3) logs a root cause for each such complaint, where a contributing factor is identified; (4) generates reports reflecting customer complaint root causes; (5) analyzes root- cause trends; and (6) regularly discusses root-cause trends with the [Customer Service Organization] and the other appropriate business units.

R.D. at 29.

[6] The Commission considered PAWC's rate case at its Public Meeting on July 11, 2024. In a Motion, Chairman Stephen M. DeFrank addressed, *inter alia*, the quality-of-service issues. The Motion passed by a vote of 4-1, with Vice Chair Kimberly Barrow dissenting. Commissioner Kathryn L. Zerfuss also issued a Statement, which noted the quality-of-service issues, among other things.

annual revenue increase of $88,121,069 to the *pro forma* revenue for water service and $11,207,944 to the *pro forma* revenue for wastewater service. Order at 4, 75-75, 391. In its Order, the Commission also addressed the extensive public interest in the proceeding and the number of quality-of-service concerns raised. *Id.* at 8-13, 394-395.

The Commission discussed the trend of quality-of-service issues in PAWC's Northeastern Service Territory and pointed to specific examples of testimony from the public input hearings held in Scranton, Pennsylvania as well as the telephonic public input hearings. The Commission noted that, in addition to the public input hearing testimony regarding a lack of water quality in PAWC's Northeastern Service Territory, approximately 38% of the complaints and 40% of the comments filed in the rate case regarding quality-of-service pertained to the Lackawanna County region. The Commission specifically identified comments and complaints from customers in Dunmore, Carbondale, and Scranton, Pennsylvania. *Id.* at 8-13.

Based upon the cumulative number of quality-of-service concerns raised in the proceeding via complaints, written comments, and testimony presented at the public input hearings, the Commission determined that further investigation was warranted to determine the cause of the quality-of-service issues and ensure that PAWC effectively manages the issues toward remediation. *Id.* at 13.

Thus, the Commission directed the Law Bureau, in conjunction with the Bureau of Technical Utility Service (TUS), to implement an investigation into the quality-of-service issues in PAWC's Northeastern Service Territory. The Commission specified that the investigation may involve conferencing with PAWC, issuing data requests, coordinating with the DEP, or any other action deemed necessary by Commission staff to explicate the quality-of-service issues. Additionally, the Commission directed that the Law Bureau and TUS prepare a root cause analysis report exhibiting any key findings by no later than May 7, 2025. The Commission noted that staff may make recommendations for future action by PAWC, including but not limited to, modification of PAWC's practices, procedures, or LTIIP and may refer the findings to BI&E, DEP, or both, as deemed necessary. *Id.* at 13, 394-395.

Moreover, as it pertains to the rate increase and customer service issues, the Commission declined to condition PAWC's approved rate increase upon the imposition of customer service performance standards, as proposed by the OCA. The Commission specified that there is no finding in this case that the public utility's service deficiencies were demonstrated to be so serious as to constitute the failure to provide safe and adequate service in violation of Section 1501 of the Code, 66 Pa.C.S. § 1501. *Id.* at 369.

On August 6, 2024, the City of Scranton filed a Petition for Reconsideration of the Commission's Order requesting that the Commission stay the approved rate increases until the investigation into service and water quality is complete. *See Pa. Pub. Util. Comm'n, Office of Consumer Advocate, and Office of Small Business Advocate, et al. v. Pennsylvania-American Water Company*, Docket Nos. R-2023-3043189, *et al.* (Order entered September 26, 2024). The Commission denied the Petition for Reconsideration on September 26, 2024. *Id.* at 25. The Commission explained that, instead of denying any rate increase, it decided to initiate an investigation into the quality-of-service issues, while simultaneously authorizing an overall annual revenue increase, and that the investigation has no impact on the approved rate increase. *Id.* at 23-24.

II. INVESTIGATORY PROCESS

Pursuant to the Commission's July 22, 2024 Order, the Law Bureau and TUS (collectively, Commission staff) implemented an investigation into the quality-of-service issues in PAWC's Northeastern Service Territory at Docket No. M-2024-3051789. Prior to doing so, Commission staff clarified the scope of PAWC's Northeastern Service

Territory as described in the Commission's Order, which, as noted above, is defined as PAWC's water system facilities within the DEP's northeast region. *Supra*, Section I.A.

As part of its investigation, on September 10, 2024, Commission staff sent an information inquiry to DEP's Northeast Regional Office to determine whether DEP had any pending actions or outstanding complaints against PAWC in that region. DEP's Northeast Regional Office responded on September 17, 2024, indicating that there were no pending compliance actions or outstanding complaints for PAWC.

Subsequently, on September 19, 2024, Commission staff conferenced with PAWC representatives to discuss the events leading to the investigation, the parameters of the investigation, and the likely need for a series of data requests.

On October 28, 2024, Commission staff's Data Request Set 1 was served on PAWC via Secretarial Letter. Data Request Set 1 primarily consisted of broad questions aimed at identifying the actions taken by PAWC to resolve customer complaints related to quality-of-service in its Northeastern Service Territory. On November 8, 2024, PAWC provided a complete response to Data Request Set 1.[7]

On February 6, 2025, Commission staff's Confidential Data Request Set 2 was served on PAWC via Secretarial Letter. Confidential Data Request Set 2 solicited specific information regarding water system improvements and/or replacements in PAWC's Northeastern Service Territory and information on how PAWC integrates system performance metrics into its capital improvement plan. On February 20, 2025, PAWC provided a complete response to Confidential Data Request Set 2. Subsequently,

[7] The information gathered from the data requests is discussed below in Section IV with a focus on the issues that arose based on the initial, broad data request. The discussion pertains to the root cause of the quality-of-service issues in PAWC's Northeastern Service Territory. Given that not all information presented concerns, not all data requests are discussed.

on March 27, 2025, PAWC provided a supplemental response to a portion of Confidential Data Request Set 2 to offer a further update on the matter.

On April 9, 2025, Commission staff's Confidential Data Request Set 3 was served on PAWC via Secretarial Letter. Confidential Data Request Set 3 sought more detailed information on specific PAWC projects and efforts in PAWC's Northeastern Service Territory identified in PAWC's responses to Confidential Data Request Set 2. On April 17, 2025, PAWC provided a complete response to Confidential Data Request Set 3.

Further, on April 25, 2025, TUS staff attended a site visit where it toured PAWC's Blue Mountain Lakes Water Treatment Plant (WTP) to view a newly installed manganese removal facility.

III. RELEVANT ISSUES

Consistent with the Commission's July 22, 2024 Order, the issues at hand in this investigation include determining the root cause of the quality-of-service issues in PAWC's Northeastern Service Territory and identifying whether PAWC is effectively managing the quality-of-service issues toward remediation. Order at 13.

In this regard, the Commission must act within the authority granted to it by the General Assembly in the Code. *See Feingold v. Bell of Pennsylvania*, 383 A.2d 791, 794 (Pa. 1997); *see also City of Pittsburgh v. Pa. Pub. Util. Comm'n*, 43 A.2d 348, 350 (Pa. Super. 1945). Under Section 501 of the Code, the Commission has the general administrative power and authority to supervise and regulate all public utilities doing business within the Commonwealth. 66 Pa.C.S. § 501(b).

This broad power includes the regulation of public utility service and facilities. Pursuant to Section 1501 of the Code, public utilities have a duty to "furnish and maintain adequate, efficient, safe, and reasonable service and facilities" and to "make all such repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as may be necessary or proper for the accommodation, convenience, and safety of its patrons, employees, and the public." 66 Pa.C.S. § 1501. Section 1501 also specifies that, "such service . . . shall be reasonably continuous and without unreasonable interruptions or delay." *Id.*

The term "service" has been broadly defined to include a variety of acts performed by a public utility. *See, e.g. AT&T v. Pa. Public Utility Commission*, 568 A.2d 1362, 1364 (Pa. Cmwlth. 1990). Section 102 of the Public Utility Code provides that service:

> [u]sed in its broadest and most inclusive sense, includes any and all acts done, rendered, or performed, and any and all things furnished or supplied, and any and all facilities used, furnished, or supplied by public utilities . . . in the performance of their duties under this part to their patrons, employees, other public utilities, and the public, as well as the interchange of facilities between two or more of them.

66 Pa.C.S. § 102.

Public utilities are required to file tariffs setting forth their rates, rules, regulations, and practices with respect to such service for Commission approval. *See* 66 Pa.C.S. § 102, 1302. Each utility is further required to adhere to its Commission-approved tariff. 66 Pa.C.S. § 1303. Commission-approved tariffs have the force and effect of law, and are legally binding upon the utility, its customers, and the public. *DiSanto v. Dauphin Consol. Water Supply Co.*, 436 A.2d 197, 201 (Pa. Super. 1981); *Brockway Glass Co. v. Pa. Pub. Util. Comm'n*, 437 A.2d 1067, 1070 (Pa. Cmwlth. 1981).

Thus, it is well-within the Commission's jurisdiction to address the quality of the service provided by a public utility. 66 Pa.C.S. § 1501; *see* 66 Pa.C.S. § 308.1 (the Commission may establish bureaus and positions to ensure adequate service quality);

see also 66 Pa.C.S.§ 523(a) (the Commission may consider the efficiency, effectiveness and adequacy of service) and 66 Pa.C.S. § 526(a) (the Commission may consider whether service rendered is inadequate in terms of quantity or quality). The Commission's regulation of service quality encompasses issues involving the quality of water service. *Rovin v. Pa. Pub. Util. Comm'n*, 502 A.2d 785, 787 (Pa. Cmwlth. 1986) (*Rovin*).

Although the Commission regulates the quality of water service, it lacks jurisdiction over "water quality." *Id.* In *Rovin,* 502 A.2d at 787, the Commonwealth Court held that matters involving the quality or purity of water, rather than the quality or character of water service provided by a public utility per the meaning Section 1501 of the Code, fall within the jurisdiction of the DEP and the Federal Environmental Protection Agency (EPA) under State and Federal safe drinking water laws. *See also Polites v. Pa. Pub. Util. Comm'n*, 928 A.2d 388, 391 (Pa. Cmwlth. 2007) (DEP regulates matters affecting water quality). For instance, the DEP's Bureau of Safe Drinking Water oversees Pennsylvania's Safe Drinking Water Act. *See* 35 P.S. §§ 721.1-721.17.

Additionally, the term service as set forth in Section 1501 of the Code does not encompass water disinfection methods. In *Pickford v. Pa. Pub. Util. Comm'n*, 4 A.3d 707, 714-715 (Pa. Cmwlth. 2010), the Commonwealth Court held that the Commission lacks jurisdiction over water disinfection treatment.[8] In particular, the Court explained that a public utility's choice of treatment is not akin to service as contemplated in Section 1501 of the Code. *Id.* at 713. Citing *Rovin*, 502 A.2d at 787, the Court reiterated that there is a "distinction between water *service*, which the Commission may regulate, and water quality, which may only be regulated by the DEP." *Id.* (emphasis in original).

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[8] The Court also noted that, when a water treatment method is deemed safe, a public utility's decision to use a particular method is a managerial decision. *Pickford*, 4 A.3d at 715. Under the management decision doctrine, "it is not within the province of the Commission to interfere with the management of a utility unless an abuse of discretion or arbitrary action by the utility has been shown." *Pa. Pub. Util. Comm'n v. Philadelphia Electric Co.*, 561 A.2d 1224, 1226-1227 (Pa. 1989).

Therefore, the Commission does not have jurisdiction to make an initial determination regarding water quality. However, to the extent that an agency with preeminent jurisdiction over water quality makes an adverse determination regarding a public utility's water quality, that determination may potentially support the Commission's finding that a public utility violated its obligation to provide adequate, safe, and reasonable service under Section 1501 of the Code. 66 Pa.C.S. § 1501.

Further, consistent with its authority to regulate water service and facilities, the Commission's regulations require that a public utility's water plant be designed and constructed so as to conform to reasonably acceptable engineering practices, provide reasonably adequate and safe service to customers, and conform to DEP's requirements concerning sanitation and potability of water. 52 Pa. Code §§ 65.17(a), 65.18(a).

IV. FINDINGS, CONCLUSION, AND RECOMMENDATION

Again, the issues at hand in this investigation included determining the root cause of the quality-of-service issues in PAWC's Northeastern Service Territory and identifying whether PAWC is effectively managing the quality-of-service issues toward remediation. Order at 13. With respect to these issues, Commission staff made several factual findings as part of its root cause analysis, which are set forth and discussed below. Commission staff's conclusion is also detailed below.

A. Factual Findings and Root Cause Analysis

As a result of the investigation, Commission staff made the following factual findings regarding the quality-of-service issues in PAWC's Northeastern Service Territory and PAWC's efforts to remediate the issues:

<u>Quality-of-Service Issues</u>

- PAWC's Scranton Water System appears to have a higher-than-average chlorine residual compared to PAWC's other systems.

- Several of PAWC's discrete water systems in its Northeastern Service Territory were frequently above the secondary maximum contaminant level (SCML) for manganese during the Review Period from January 2021 to June 2024 (Review Period).

- PAWC's Lake Scranton WTP experienced a source water seasonal reservoir turnover event in late fall of 2023.

- PAWC's Scranton Water System experiences main breaks in line with its statewide average, but above the average of its other water systems in the northeast region.

- Since the filing of its rate case, PAWC received 15 informal complaints due to high manganese levels in the Blue Mountain Lakes Water System and 8 informal complaints due to main breaks in the Scranton Water System.

<u>Remediation</u>

- PAWC is in the process of fully commissioning a new 3.5-million-gallon baffled water storage facility at its Lake Scranton WTP that will assist in improving the overall disinfection efficiency of the system.

- PAWC installed an upgraded chemical feed system at its Lake Scranton WTP to reduce the amount of manganese in the treated water.

- PAWC installed new water treatment at its Blue Mountain Lakes Water System to remove higher levels of manganese from the Blue Mountain Lakes Water System's groundwater sources.

- PAWC invested significantly in recent main replacement projects in its Scranton Water System.

- PAWC increased its customer outreach in response to customer complaints.

These findings are addressed below in terms of the: (1) Scranton Water System chlorine residual, (2) manganese, (3) Scranton Reservoir turnover, (4) main breaks and replacements, and (5) informal complaints and customer outreach.

1. Scranton Water System Chlorine Residual

First, we address the chlorine residual in PAWC's Scranton Water System. PAWC provided data indicating its highest recorded chlorine residual for each month in the Review Period for each of the discrete systems in its Northeastern Service Territory. The data for PAWC's Scranton Water System is presented below in Figure 1.

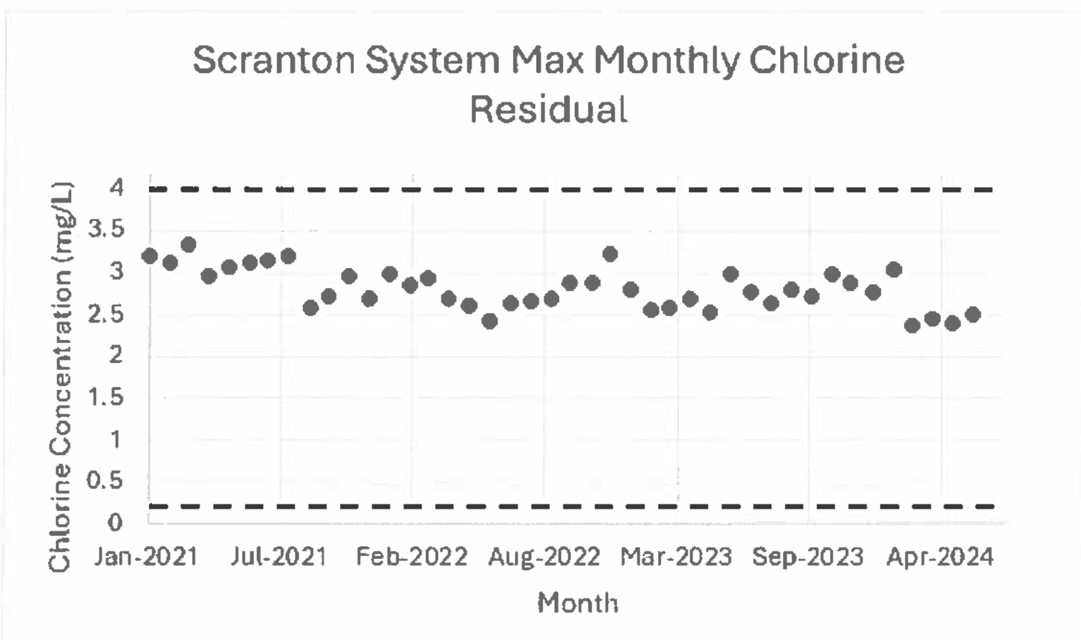

Figure 1: Maximum Chlorine Residual by Month in PAWC's Scranton Water System

The EPA requires a maximum residual disinfectant level (MaxRDL) of 4 milligrams per liter (mg/L) and a minimum residual disinfectant level (MinRDL) of 0.2 mg/L in a water distribution system. The MinRDL and MaxRDL are represented by the dashed lines in Figure 1. PAWC's Scranton Water System, at its peak monthly residual disinfectant level, does not exceed the MaxRDL and is significantly above the MinRDL. PAWC's Scranton Water System, however, appears to have a higher-than-average chlorine residual compared to PAWC's other water systems and, as noted above, during the public input hearings in PAWC's rate case, several PAWC customers in Scranton, Pennsylvania testified that their water smelled of excessive chlorine. *Supra*, Sections I.B. and I.C. Thus, after reviewing the data provided by PAWC, Commission staff requested that PAWC explain why its Scranton Water System has higher chlorine concentrations as compared to its other water systems and identify potential methods to resolve the issue.

PAWC responded that, due to the size and complexity of its Scranton Water System, PAWC must maintain a higher chlorine residual than other systems to ensure compliance with the MinRDL of 0.2 mg/L. Further, chlorine residuals of 3.0 mg/L or slightly above are required to take full advantage of "CT log inactivation" requirements, which depend on instantaneous flows related to system demand, storage volume, water temperature, potential of hydrogen (pH), and an assigned baffling factor. CT log inactivation refers to the product of chlorine concentration, or "C," and the contact time, or "T," which is required to achieve a specified reduction in the amount of a pathogen. The inactivation of the pathogens is measured on a log scale and it is referred to as "log inactivation." Currently, PAWC modulates chlorine residuals to ensure simultaneous compliance with CT log inactivation and MinRDL requirements.

As for methods to resolve the issue, PAWC indicated that it is currently in the process of fully commissioning a new 3.5-million-gallon baffled water storage facility at the Lake Scranton WTP that will assist in improving the overall disinfection efficiency of the water delivered to the distribution system. In particular, increasing the baffling factor of the storage facility will ultimately allow for lower concentrations of chlorine to be used, while still meeting CT log inactivation requirements.

2. Manganese

Next, we address manganese concentrations in several of PAWC's discrete water systems in its Northeastern Service Territory. In this regard, data provided by PAWC indicated that several of its discrete water systems were frequently above the SCML for manganese during the Review Period.

The EPA established SCMLs to manage aesthetic considerations for drinking water including taste, color, and odor. Water with high levels of manganese is prone to discoloration and staining, as the manganese in the water can oxidize to form brown or black particles. The EPA sets SCMLs as a recommendation, not a federally enforceable limit, and states are allowed to set different limits. Pennsylvania has adopted the recommended Federal EPA value for its SCML at 0.05 mg/L. The EPA has also set a health advisory limit (HAL) for manganese at 0.3 mg/L. Two common methods are used to treat manganese in concentrations that are above the SCML. The first is to oxidize the manganese, precipitating it into its solid form, followed by filtering it for removal. The second is to sequester the manganese by adding a chemical, typically a phosphate compound, which forms a complex with manganese making it more soluble in water. This prevents the manganese from oxidizing and causing color or staining issues for customers. While manganese sequestration can prevent aesthetic issues, this treatment process does not remove manganese from water, and it does not prevent negative health effects from a high manganese concentration. Therefore, sequestration can be used in the case of SCML exceedances, but not for HAL exceedances. For each of systems in PAWC's Northeastern Service Territory that experienced source SCML exceedances during the Review Period, Commission staff inquired regarding the cause and the steps being taken to manage the exceedances. PAWC's responses are described below.

With regard to PAWC's Scranton Water System, Commission staff notes that manganese may be related to reservoir turnover, which is discussed more fully below. *Infra*, Section IV.A.3. PAWC recently invested $2.3 million into the construction of a building that includes two sodium permanganate bulk storage tanks, a day tank, and peristaltic chemical feed pumps and controls. PAWC indicated that these upgrades replaced a previously used potassium permanganate feed system as of May 2024 and provide greater reliability and process control. PAWC provided data comparing the Lake Scranton WTP's manganese output before and after the installation of the upgraded chemical feed system, using May–December 2023 and May–December 2024 as comparison points. The data is summarized below in Table 1.

Time Period	**May–December 2023**	**May – December 2024**
Average Raw Mn (mg/L)	0.21	0.30
Max Raw Mn (mg/L)	0.81	0.80
Average Plant Effluent Mn (mg/L)	0.03	0.01
Max Plant Effluent Mn (mg/L)	0.11	0.03

Table 1: Raw and Effluent Manganese Concentrations in the Scranton Water System

As shown in Table 1, despite higher average raw manganese after the installation of the upgraded chemical feed system, PAWC reduced the average plant effluent manganese concentration from 0.03 mg/L to 0.01 mg/L, and the max plant effluent concentration from 0.11 mg/L to 0.03 mg/L. Notably, this reduced the maximum plant effluent manganese concentration below the SCML.

With regard to the Blue Mountain Lakes Water System, PAWC previously used sequestration as the primary treatment option for manganese. However, changes to the raw water quality that PAWC observed in 2024 have rendered the sequestration treatment no longer adequate. Specifically, one of the groundwater sources to that system, a well PAWC refers to as EP103, had raw water manganese concentrations as high as 0.63

mg/L, substantially higher than the SCML and HAL. According to PAWC, the well at EP103 was drilled 305 feet below ground level (ft-bgl), into the Trimmers Rock geologic formation, which is known to have naturally occurring high levels of manganese in some areas. Also, according to PAWC, it is unclear why the raw water quality in EP103 changed so drastically in 2024. PAWC considered one potential cause to be regional declines in aquifer levels, which could be caused by drought or long-term pumping, and would change the well's recharge area and therefore its water quality. Alternatively, water-bearing zones could have been clogged by mineralization or biological activity, or the opening or closing of rock fractures due to an earthquake. PAWC notes that a 4.8-magnitude earthquake occurred in nearby Tewksbury, New Jersey in April 2024.

On March 27, 2025, PAWC completed the installation of a manganese removal system at EP103. With the installation of the manganese removal system, the concentration of manganese in the treated water averages 0.017 mg/L and has varied between 0.01 and 0.03 mg/L, below the SCML. On April 25, 2025, TUS staff toured PAWC's Blue Mountain Lakes WTP to view the newly installed manganese removal facility. TUS staff observed that PAWC installed two activated greensand filters, a backwash tank, a treated water tank, booster pumps, and a prefabricated building to house the pumps and skid-mounted treatment system. The system uses chlorine to oxidize the manganese, precipitating it to its solid form, and then removes the manganese via greensand filters. The backwash tank allows for the filter media to be cleaned. PAWC indicated that it invested $2.6 million in the new treatment facility.

As for PAWC's Berry Hollow Water System and Hillcrest Water System, these systems are groundwater systems that have raw water sources that exceed the SCML for manganese. However, both systems have DEP-permitted sequestration systems that limit the negative effects of the manganese.

Additionally, PAWC's Lehman Pike (Saw Creek) Water System and Mid Monroe Water System have groundwater sources that have multiple entry points. These systems have a mix of DEP-permitted manganese removal and sequestration systems. The wells with manganese removal systems are also permitted for sequestration should any manganese remain after passing through the removal system.

Finally, PAWC's Montrose Water System and Susquehanna Water System have surface water sources and use conventional treatment processes. The Montrose Water System has a stable source of supply that does experience seasonal variations. While SCML exceedances are limited to infrequent events, PAWC is in the process of redesigning filters to improve the effectiveness of the treatment. The Susquehanna Water System, however, has a source of supply that is prone to rapid changes in raw water quality resulting in frequent treatment challenges. PAWC is currently designing a new treatment plant to replace the existing plant. In the interim, PAWC has applied for a permit with DEP for a new pre-oxidant addition to the treatment process that will improve the effectiveness of the existing manganese removal system.

3. Scranton Reservoir Turnover

As it pertains to the reservoir turnover noted above, PAWC's Lake Scranton WTP experienced a source water seasonal turnover event in late fall of 2023. *Supra*, Section IV.A.2. Reservoir turnover is caused by the rapid cooling and warming of the water, causing the water to change its stratification, or layering, between the top and bottom layers. Reservoir turnover is most dramatic in the fall months when nighttime and daytime temperatures are dramatically different. At night, when the surface water cools and becomes denser than the water on the bottom, the water from the bottom rises, carrying with it higher concentrations of organics and metals like manganese and iron.

In PAWC's Statement No. 2-R, Rebuttal Testimony of James Runzer, in the rate case, PAWC indicated that the reservoir turnover in late fall 2023 caused system wide issues, which may have caused complaints regarding brown or dirty water, or discolored laundry. PAWC Statement No. 2-R at 33. PAWC's upgraded chemical feed system at the Lake Scranton WTP, as discussed previously, allows PAWC to respond more rapidly to feed system malfunctions to improve water quality. Additionally, it is notable that the seasonal turnover event occurred around the same time of PAWC's base rate case filing which may have prompted higher than normal complaints about water service quality.

4. Main Breaks and Replacements

With respect to main breaks, PAWC provided data on its main breaks on a monthly basis during the Review Period for each of its systems in its Northeastern Service Territory. PAWC provided both the total number of main breaks in the system, and the number of main breaks that resulted in an excess of 500,000 gallons of water being lost. Over the course of the Review Period, PAWC's Scranton Water System experienced 0.71 main breaks per mile of main, annualizing to 0.20 main breaks per mile per year. This is in line with PAWC's statewide average over the course of the Review Period, which was also 0.20. PAWC's other systems in the northeast region averaged 0.57 main breaks per mile, annualizing to 0.16 main breaks per mile per year. Main breaks can cause low water pressure and discoloration that may result in customer complaints. As PAWC's largest system in the northeast by customer count, issues with the Scranton Water System are likely to affect more customers and therefore cause more complaints. Further, on September 28, 2023, a substantial main break resulted in four schools in Scranton having to close for the day. This was likely disruptive to many PAWC customers in Scranton, and the timing of the main break with PAWC's rate case filing may have resulted in increased customer complaints.

In February 2024, PAWC began a significant main replacement project in its Scranton Water System, replacing 28,851 linear feet (LF) of cast iron main with new ductile iron (DI) pipe, including 23,061 LF of 8-inch diameter and 5,790 LF of 12-inch diameter DI pipe. The DI main replaced cast iron main between 4 and 12 inches in diameter, dating from between 1868 and 1924. This project, including restoration and final paving, was completed in the fall of 2024. PAWC began an additional main replacement project in Scranton and Dunmore, Pennsylvania in February 2025. This additional project involves replacing more than 30,000 LF of small diameter pipe with 8-inch or 12-inch diameter DI pipe. The water main being replaced is cast iron of 2 to 12 inches in diameter, and dates from 1888 to 1964. As of April 17, 2025, PAWC's additional main replacement project was 40% complete.

5. Informal Complaints and Customer Outreach

Since the filing of its rate case in November 2023, PAWC received 57 informal complaints related to quality of service in PAWC's Northeastern Service Territory. PAWC categorizes its informal complaints in part by identifying the complaint category and the root cause. Of the 57 informal complaints, 15 were due to high manganese levels in the Blue Mountain Lakes Water System. As discussed previously, PAWC completed the installation of a manganese removal system at the Blue Mountain Lakes Water System. Further, eight of the informal complaints were due to main breaks in the Scranton Water System. As discussed above, PAWC has made a substantial investment in main replacements in its Scranton Water System. Seven informal complaints were related to company excavation, which is necessary to replace mains.

PAWC has increased its customer outreach in response to the quality-of-service complaints received as part of its most recent rate case. PAWC indicated that it intends to issue press releases on infrastructure improvement projects as well as send emails and/or letters to customers regarding current and future infrastructure projects in their area. Further, PAWC indicated that it is finalizing a plan to notify customers in areas of its systems that frequently experience water pressure over 100 pounds per square inch and recommend that they install a pressure reducing valve.

B. Conclusion and Recommendation

In light of the above findings and analysis, Commission staff's investigation found that the quality-of-service issues in PAWC's Northeastern Service Territory relevant to the rate case do not appear to be tied to a singular, technical root cause. Rather, these quality-of-service issues appear to be attributed to the unique aspects of the 36 discrete water systems in PAWC's Northeastern Service Territory, which each have their own operating and raw water quality characteristics. As such, it does not appear there are any systemic issues that span across PAWC's Northeastern Service Territory that are affecting its provision of water service as a public utility.

In particular, the coincidental timing of the reservoir turnover event, a major main break in the PAWC's Scranton Water System, and the manganese issues in PAWC's Blue Mountain Lakes Water System with the PAWC's rate case may have prompted a higher-than-usual number of quality-of-service complaints and comments. Based upon Commission staff's conference with PAWC and information inquiry to DEP as well as PAWC's responses to a series of data requests and TUS staff's site visit, Commission staff is satisfied that PAWC is taking the necessary corrective steps to address the quality-of-service issues in its Northeastern Service Territory.

As noted above and discussed throughout this Root Cause Analysis Report, PAWC has undertaken implementing the following corrective steps to address the quality-of-service issues in its Northeastern Service Territory: (1) being in the process of fully commissioning a new 3.5-million-gallon baffled water storage facility at its Lake Scranton WTP that will assist in improving the overall disinfection efficiency of the system; (2) completing the installation of an upgraded chemical feed system at its Lake Scranton WTP to reduce the amount of manganese in the treated water; (3) completing the installation of new water treatment at its Blue Mountain Lakes Water System to remove higher levels of manganese from the Blue Mountain Lakes Water System's groundwater sources; (4) making significant investment in recent main replacement projects in its Scranton Water System, and (5) increasing customer outreach in response to customer complaints. *Supra*, Section IV.A. Further, PAWC has identified that it will enhance communication to customers to increase their awareness of current and future infrastructure projects in impacted areas.

Collectively, it appears PAWC has been proactive in identifying the underlying specific factors within each discrete system that were the cause of customer complaints and has adjusted its capital improvement plan to make the necessary investments to resolve each issue. Therefore, it is Commission staff's opinion that PAWC is utilizing the necessary tools to manage the quality-of-service issues towards remediation and Commission staff recommend that PAWC continue with such corrective steps.

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