STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

RE: PENNICHUCK WATER WORKS, INC.
DW 24- xxx

2024 QUALIFIED CAPITAL PROJECT ADJUSTMENT CHARGE FILING

DIRECT TESTIMONY
OF
John J. Boisvert

February 15, 2024

Professional and Educational Background

Q. **Please state your name and position with Pennichuck Water Works, Inc.;**

A. My name is John J. Boisvert. I am currently the Chief Engineer of Pennichuck Water Works, Inc. (the "Company" or "PWW") located at 25 Walnut Street in Nashua, New Hampshire. I have worked for the Company since February 1, 2006. On January 1, 2024, I assumed the role of Chief Executive Officer (CEO) of Pennichuck Corporation (Penn Corp), and its subsidiaries, while retaining the role of Chief Engineer, following the retirement of Larry D. Goodhue on December 29, 2023. I am a licensed professional engineer in New Hampshire and Maine. Pennichuck East Utility, Inc. ("PEU") and Pittsfield Aqueduct Company, Inc. ("PAC") are subsidiaries of Pennichuck Corporation ("Pennichuck," "Penn Corp" or "Corporation") along with PWW.

Q. Please describe your educational background.

A. I have a Bachelor of Science degree and a Master of Science degree in Civil Engineering from the University of New Hampshire in Durham, New Hampshire. I also hold a Master's Degree in Environmental Law and Policy from Vermont Law School in South Royalton, Vermont.

Q. Please describe your professional background.

A. Prior to joining the Company, I served as a Team Leader for Weston & Sampson Engineers of Portsmouth, New Hampshire in their Water Practices Group from 2000 to 2006. Prior to Weston & Sampson, I was employed by the Layne Christensen Company of Shawnee Mission, Kansas as Regional Manager for their Geosciences Division in Dracut, Massachusetts from 1994 to 2000. I completed graduate school in 1992 and was

employed by Hoyle, Tanner, & Associates of Manchester, New Hampshire as a Project Engineer from 1992 to 1994. Prior to entering full time graduate programs at the University of New Hampshire and Vermont Law School, I was employed by Civil Consultants of South Berwick, Maine as a Project Engineer from 1986 to 1989 and by Underwood Engineers of Portsmouth, New Hampshire as a project Engineer from 1985 to 1986.

In addition to my work and educational experiences, I have served on two statewide commissions created by the NH Legislature. These were the SB60 Water Sustainable Funding Commission and the New Hampshire Water Sustainable Funding Commission. I currently serve on the New Hampshire Water Council, representing drinking water interests. I am a member of the NH Water Works Association ("NHWWA") and the New England Water Works Association ("NEWWA"). In 2023, I recently completed the second of two three-year terms on the NEWWA Board of Directors serving as the NH State Director. This same year I was elected to be the Vice President of NEWWA.

Q. What are your responsibilities as Chief Engineer?

A. As Chief Engineer, I manage and oversee the Company's Engineering Department. I lead the Company's Asset Management program. As head of the Engineering Department, I am ultimately responsible for the planning, design, permitting, construction, and startup of major capital projects, including pipelines, reservoirs/dams, building structures, pumping facilities, treatment facilities, and groundwater supplies. The Engineering Department staff provides regular technical assistance to the Company's Water Supply Department, Distribution Department, Customer Service Department, and Senior Management.

Q. What are your responsibilities as Chief Executive Officer of Penn Corp, and the subsidiaries?

A. As Chief Executive Officer for Penn Corp, I am responsible for the overall management of Penn Corp and its subsidiaries, including PWW. I report to the Board of Directors. I also work with the Chief Operating Officer, the Chief Financial Officer, Treasurer/Assistant Treasurer, Corporate Secretary, and the Director of Human Resources and the Director of Information Technology to: (1) implement short and long-term financial and operating strategies, (2) ensure the adequate funding of debt and expenses, (3) effectuate ongoing and consistent corporate governance and compliance, and (4) enable Penn Corp's utility subsidiaries to provide high quality water service at affordable rates, on a consistent basis in addition to my responsibilities as Chief Engineer.

Q. Have you previously testified before this or any other regulatory commission or governmental authority?

A. Yes. I have provided written testimony before the Commission in my role as Chief Engineer. My testimony was in support of rate making (prior to the implementation of the PWW and PEU QCPAC), PWW/PEU QCPAC filings since their inception, numerous financing dockets, and other dockets relating to franchise expansion/modification, permits/licenses, and special contracts/agreements. In addition, as a member of the NHWWA Legislative Committee, I have had the opportunity to provide written and oral testimony regarding legislation relating to drinking water before NH House and NH Senate committees.

Q. What is the purpose of your testimony?

A. My testimony will present the major Qualified Capital Projects initiated and completed in 2023 as well as providing details of the major capital projects planned and budgeted for 2024-2026 as part of the Company's 2024 Qualified Capital Project Adjustment Charge ("QCPAC") filing. My testimony supports, and is in addition to, testimony provided by the Company's Chief Operating Officer Donald L. Ware for this docket. Detailed project listings mentioned in the pre-filed of Mr. Ware's and in Exhibit DLW-1 Pages 1 – 6.

Q. What types of projects can be described as "major capital projects"?

A. Major capital projects require significant capital investment and are approved annually in the Company's capital budget by the Company's Board of Directors. Projects are associated with dams, treatment facilities, pumping facilities, storage tanks, water main replacements, valve and hydrant replacements, building facility improvements and refurbishments, as well as non-structural efforts to improve Company performance, such as Asset Management. These generally include:

- The replacement of infrastructure that has: (1) reached or is reaching the end of its useful life, (2) does not achieve the level of service required of it (water quality, capacity, and efficiency), or (3) the Company's ability to properly maintain it (outdated/lack of repair parts, etc.) is either impractical or more costly to repair or rehabilitate than replacing it.
- Infrastructure upgrades to improve system performance.
- Investments to ensure compliance with the primary and secondary Safe Drinking Water Act ("SDWA") standards.

- Engineering studies and evaluations to assess infrastructure and system performance to aid in planning future capital investment needs.
- The implementation of processes and systems such as Asset Management, which incorporates/integrates Geographical Information Systems (GIS), Computerized Management and Maintenance System (CMMS- Cityworks as of 12/31/2020), electronic time and record keeping, as well as inventory management, allowing the Company to have access to the data and information needed to make cost effective, immediate and long-term operations and planning decisions.

Q. **What is the process that the Company employs and what are the factors the Company considers when developing the capital budget for water main replacements?**

The Company considers several factors in developing a capital budget for water main rehabilitation, replacement, and/or new construction. The Company completed the first phase of its Asset Management Initiative. The Company inventoried its pipeline assets and documented them within its Geographical Information System (GIS) database. An initial condition assessment and a preliminary evaluation of the consequence of failure of certain water main assets was also completed. This application and effort has thus far served as an effective tool to determine which assets are most critical and should be evaluated in more detail for possible inclusion in the current 2024 – 2026 capital budgets/forecasts. With the transition to a new Computerized Management and Maintenance software, the Asset Management Initiative continues to be expanded to: (1) look more closely at specific assets to identify the risk of failure, (2) determine if there is

a structural failure (break), or (3) the asset is not attaining the required level of service (water quality, flow, or pressure). The usage of the Asset Management system in this regard has provided the ability to facilitate more predictive guidance in planning for and implementing future capital expenditures. This approach is ongoing and being refined or enhanced as more data and information on the Company's assets becomes available. This Asset Management approach considers the following for all assets including:

- Water main break/failure history;
- Water quality problems;
- Fire protection flows;
- The proximity of and support provided to key critical customers (public safety, government, hospitals, etc.);
- Coordination with gas company (or other buried utility assets) replacement projects;
- Geographic grouping of streets where mains are to be replaced/rehabilitated for improved efficiency by aggregating main replacement work in close proximity to each other;
- The opportunity to take advantage of efficiencies gained from coordinating with the paving, storm water and sewer projects of cities and towns served by the Company, in the replacement of water mains where substandard plastic or aging unlined cast iron water mains are present. There are cost savings in pavement repair and traffic control costs associated with completing projects while the municipality or other utility company is also working on a street.
- Industry guidelines of the American Water Works Association for the replacement of water mains using an average life expectancy for water mains of 100 years, absent

specific information on a particular asset. The Company considers this rate to be a reasonable basis of main replacement planning and determination, until such time that the Asset Management System will better and more fully allow for a more system/asset specific assessment to be performed. In terms of targeted water mains to be considered and evaluated, the Company, based on GIS assets, still has approximately: (1) miles of unlined cast iron water main in service, most of which is over 100 years old and was installed beginning in 1853, (2) about 40.2 miles of Asbestos cement water main (most of which was installed between the mid 1950's and 1960's), (3) 0.2 miles of small diameter steel water main installed primarily in the 1950's, and (4) 0.1 miles of substandard plastic water mains, and (5) 7.49 miles of unknown material that was installed by the original developer in the 1970's and 1980's (prior to the NHDES setting minimum standards on water main materials). Replacement of aging and substandard infrastructure will continue to be a major driver of the Company's water main replacement for the foreseeable future.

Q. What are the major projects the Company started in 2022 that the Company completed as part of the 2023 Capital Budget?

The Company did not have any water main replacement/additions that began in 2022 and went used and useful in 2023.

Q. What were the major water main projects completed in 2023?

A. Exhibit DLW 1-6, page 3 lines 34-51, lines 62-63, and lines 89-90 identify twenty-two (22) street locations where aging unlined cast iron and small diameter steel/galvanized water main was replaced driven by Asset Management. This work totaled $4,663,150 in 2023.

In 2023, the Company included several water main design initiatives on projects that would be bid in 2023 or early in 2024 for construction in 2024. The design process for water main replacement was moved up in response to supply chain concerns over the long lead times (40+ weeks in some cases) on water main and water service materials in 2022 and 2023. Lead times have come down significantly in 2023 for large diameter pipe; however, smaller brass fittings typically used for water services continue to have longer lead times but are improving. By designing the 2024 projects in 2023, projects could be bid in late 2023 or early in 2024 such that contractors could be engaged early to receive project materials in time to complete projects, or project section so they could be placed in service by December 31, 2024. Approximately $38,000 of internal engineering was utilized to design water main replacement on twenty-five street locations identified in Exhibit DLW 1-6, page 3, lines 62-88.

Q. Please identify and describe water main projects budgeted or planned for in 2024-2026.

A. Proposed water main construction and corresponding water main trench restoration is presented, by year, below. The majority of the water main being replaced is located in Nashua and is near or greater than 100 years old. The pipe is generally 2-inch through 8-inch diameter, unlined cast iron pipe (CI). Most of this pipe suffers from internal

corrosion (tuberculation) resulting in substandard fire flows. This internal corrosion also increases the risk of the delivery of substandard quality water to our customers, including bacteria (from the potential loss of chlorine residual) and colored water from flow fluctuation or pipe disturbance. Some of the work in 2024-2026 may be done in conjunction with sewer improvement projects by the City of Nashua. The City schedules and completes their work annually based upon a July 1st – June 30th fiscal year and does not finalize and provide the Company with their capital project plans until March or April each year. And finally, a substantial amount of water main construction will be the replacement of small diameter steel and galvanized steel water mains. These small diameter steel mains suffer from both internal and external corrosion and are very brittle. As such they lack flow capacity and do not withstand heavy vibration from paving operations and nearby excavation of other buried utilities.

Budgeted 2024 Water Main Replacements/Additions

Water main work is anticipated within the City of Nashua and the Town of Amherst as part of ongoing replacement of aging infrastructure. The projects total approximately $8,157,650 in reinvestment. Much of this effort will be associated/coordinated with other utility work and road reconstruction.

Specific Projects are as follows:

<u>Projects carried over from 2023</u>

Amory Street: Final paving and restoration for replacing 570 (Linear Feet) LF of 1887 8" Case Iron (CI) main with 12" Ductile Iron (DI)

Union Street:	Final paving and restoration for Replacing 520 LF of 1909-1978 1.25"-4" main with 12" DI
Temple Street:	Final paving and restoration for Replacing 975 LF of 1888 8" CI main with 12" DI
271 Main Street	Final paving and restoration for Replacing 260 LF of 1946 1.25" main with 2" High Density Polyethylene (HDPE)

Projects for construction in 2024

Crown Street:	Replacing 223 LF of 1901 6" CI main with 8" DI
Hobbs Avenue:	Replacing 487 LF of 1906 6" CI main with 8" DI
Elm Street:	Replacing 327 LF of 1892 6" CI main with 8" DI
Newbury Street:	Replacing 2250 LF of 1888-1940 6" & 8" CI main with 8" DI
Ritter Street:	Replacing 207 LF of 1893 6" CI main with 8" DI
Dexter Street:	Replacing 1885 LF of 1941-1949 6" & 8" CI main with 8" DI
Jones Court:	Replacing 180 LF of 1" & 1.5" Galvanized (GALV) with 4" Polyvinyl Chloride (PVC)
Broadview Avenue:	Replacing 435 feet of 1.5" & 8" with 4" PVC & 8" DI
Troy Street:	Abandon 290 LF of 1.5” CL & 2” CL
Copp Street:	Replacing 335 LF of 1927 6" CI with 6"
Route 101A:	Relocate approximately 900 feet of 24” DI Water Main as Part of a NH Department of Transportation reconstruction of Route 101A.
W. Hollis & Main:	Replace and relocate aging CI pipe, valves & fittings for seven intersections.

Meadowcrest Drive: (Bedford) Remove and replace 1900 LF of 4" Asbestos Cement (A/C) main with 8: DI w/20 M-S Services

2024 Design Projects for 2025 Construction

Reed Court:	Replacing 170 LF of 1968 1" CT main with 2" HDPE (design)
Atwood Court:	Replacing 130 LF of 1950 2" CL main with 2" HDPE (design)
Lucier Street:	Replacing 340 LF of 1928-1947 1.5" CL & 4" CI main with 8" DI (design)
Atherton Avenue:	Replacing 200 LF of 1959 2" GALV main with 4" PVC (design)
Riverview Street:	Replacing 190 LF of 1951 2" CL main with 4" PVC (design)
Foster Court:	Replacing 165 LF of 1963 1" CT main with 2" HDPE (design)
Highland Place:	Replacing 230 LF of 1924 2" GALV main with 4" PVC (design)
Palm Street:	Replacing 420 LF of 1890 4" CI main with 6" DI (design)
Long Avenue:	Installing 115 LF of new 8" DI to complete loop (design)
Long Avenue:	Replacing 65 LF of 1939 1.25" CL main with 2" HDPE (design)
Short Avenue:	Replacing 210 LF of 1926 6" CI main with 8" DI (design)
2nd Street:	Replacing 235 LF of 1961 and 2005 2" Cement (CT) & (Cement Lined (CL) main with 4" PVC (design)
Yvonne Street:	Replacing 200 LF of 1929 1.25" CL main with 2" HDPE (design)
Daniels Street:	Replacing 205 LF of 1955 1.5" CL main with 2" HDPE (design)
George Street:	Replacing 195 LF of 1948 2" CI main with 2" HDPE (design)
Tetreau Street:	Replacing 450 LF of 1957 1.25" GALV main with 2" HDPE (design)

Notre Dame Street:	Replacing 385 LF of 1926 & 1950 1.5" CL & 2" CL main with 2" HDPE (design)
Haines Street:	Abandoning 75 LF of 1934 1.5" SPL main (design)
Santerre Street:	Replacing 530 LF of 1961 & 1962 2" CL main with 4" PVC (design)
Lakeside Avenue:	Replacing 266 LF of 1949 1.25" CL main with 4" PVC (design)
St. Lazare Street:	Replacing 405 LF of 1955-1959 1.5" CL and 2" CL main with 4" PVC (design)
Spaulding Avenue:	Replacing 435 LF of 1924-1940 1.25"CL, 2" CL, and 6" CI main with 4" PVC (design)
Arlington Avenue:	Replacing 265 LF of 1920 & 1926 2" GALV and 4" CI main with 4" PVC (design)
Auburn Street:	Replacing 1190 LF of 1882-1887 4" CI and 8" CI main with 8" DI (design)
Eaton Street:	Replacing 490 LF of 1912 6" CI main with 12" DI (design)
N. 2nd Street:	Replacing 140 LF of 1919 6" CI main with 4" PVC (design)
Alstead Avenue:	Replacing 320 LF of 1920 4" CI main with 4" PVC (design)
Bordeaux Street:	Replacing 275 LF of 1960 2" CL & GALV main with 4" PVC (design)
King Street:	Replacing 865 LF of 1923 & 1957 6" CI main with 6" DI (design)
Ferson Street:	Replacing 429 LF of 1931-1938 8" CI main with 12" DI (design)
Thomas Street:	Replacing 422 LF of 1908-1926 6" CI main with 6" DI (design)
Sawyer Street:	Replacing 1620 LF of 1896-1907 6" CI main with 8" DI (design)

McKean Street:	Replacing 1688 LF of 1888 6" CI main with 8" DI (design)
Balcom Street:	Replacing 1222 LF of 1911-1923 8" CI main with 8" DI (design)
Thayer Court:	Replacing 270 LF of 1910 6" CI main with 4" PVC (design)
Gray Avenue:	Replacing 335 LF of 1907 6" CI with 8" (design)

In 2024, the Company estimates pavement restoration costs of approximately $12,000 for water mains installed in 2023, and approximately $131,000 for the design of water main replacement projects to be constructed in 2025.

Planned 2025 Water Main Replacements/Additions

Water main work is anticipated within the City of Nashua and the Town of Amherst as part of ongoing replacement of aging infrastructure. Approximately 6,050 LF will be associated with aging infrastructure replacement at a budget of approximately $3,180,250. The specific locations include:

Projects Carried over from 2024

At this time, the Company anticipates that all paving and restoration for projects planned in 2024 will be complete by year end.

Projects for Construction in 2025

Reed Court:	Replacing 170 LF of 1968 1" CT main with 2" HDPE
Atwood Court:	Replacing 130 LF of 1950 2" CL main with 2" HDPE
Lucier Street:	Replacing 340 LF of 1928-1947 1.5" CL & 4" CI main with 8" DI
Atherton Avenue:	Replacing 200 LF of 1959 2" GALV main with 4" PVC
Riverview Street:	Replacing 190 LF of 1951 2" CL main with 4" PVC
Foster Court:	Replacing 165 LF of 1963 1" CT main with 2" HDPE

Highland Place:	Replacing 230 LF of 1924 2" GALV main with 4" PVC
Palm Street:	Replacing 420 LF of 1890 4" CI main with 6" DI
Long Avenue:	Installing 115 LF of new 8" DI to complete loop
Long Avenue:	Replacing 65 LF of 1939 1.25" CL main with 2" HDPE
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Daniels Street:	Replacing 205 LF of 1955 1.5" CL main with 2" HDPE
George Street:	Replacing 195 LF of 1948 2" CI main with 2" HDPE
Tetreau Street:	Replacing 450 LF of 1957 1.25" GALV main with 2" HDPE
Notre Dame Street:	Replacing 385 LF of 1926 & 1950 1.5" CL & 2" CL main with 2" HDPE
Haines Street:	Abandoning 75 LF of 1934 1.5" SPL main
Santerre Street:	Replacing 530 LF of 1961 &1962 2" CL main with 4" PVC
Lakeside Avenue:	Replacing 266 LF of 1949 1.25" CL main with 4" PVC
St. Lazare Street:	Replacing 405 LF of 1955-1959 1.5" CL and 2" CL main with 4" PVC
Spaulding Avenue:	Replacing 435 LF of 1924-1940 1.25"CL , 2" CL, and 6" CI main with 4" PVC
Arlington Avenue:	Replacing 265 LF of 1920 & 1926 2" GALV and 4" CI main with 4" PVC
Auburn Street:	Replacing 1190 LF of 1882-1887 4" CI and 8" CI main with 8" DI

Eaton Street:	Replacing 490 LF of 1912 6" CI main with 12" DI
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King Street:	Replacing 865 LF of 1923 & 1957 6" CI main with 6" DI
Ferson Street:	Replacing 429 LF of 1931-1938 8" CI main with 12" DI
Thomas Street:	Replacing 422 LF of 1908-1926 6" CI main with 6" DI
Sawyer Street:	Replacing 1620 LF of 1896-1907 6" CI main with 8" DI
McKean Street:	Replacing 1688 LF of 1888 6" CI main with 8" DI
Balcom Street:	Replacing 1222 LF of 1911-1923 8" CI main with 8" DI
Thayer Court:	Replacing 270 LF of 1910 6" CI main with 4" PVC
Gray Avenue:	Replacing 335 LF of 1907 6" CI with 8"

2025 Design Projects for 2026 Construction

In 2025, the Company plans to complete the design of about $6,000,000 in water main replacement projects for construction in 2026. The specific street locations have not been confirmed as asset management assessments and prioritization efforts are ongoing. In addition, Company staff are engaged in planning efforts with municipal officials and other private/public utilities in an effort to coordinate each stakeholder priority to concentrate aging infrastructure replacements in common locations.

Projects Carried over from 2025

At this time, the Company anticipates that all paving and restoration for projects planned in 2025 will be complete by year end.

Projects for Construction in 2026

The Company plans to complete the construction of about $6,000,000 in water main replacement designed in 2025. The specific street locations will be identified during the 2025 budget cycle. The specific street locations have not been confirmed as asset management assessments and prioritization efforts are ongoing as discussed above. Company staff are engaged in planning efforts with municipal officials and other private/public utilities in an effort to coordinate each stakeholder priority to concentrate aging infrastructure replacements in common locations.

2026 Design Projects for 2027 Construction

In 2026, the Company plans to complete the design for about $6,000,000 in water main replacement for construction in 2027. The specific street locations have not been confirmed as asset management assessments and prioritization efforts are ongoing. In addition, Company staff are engaged in planning efforts with municipal officials and other private/public utilities in an effort to coordinate each stakeholder priority to concentrate aging infrastructure replacements in common locations.

Q. Your testimony states that water main replacement projects may vary each year due to balancing the investment in water main replacements with other major capital projects. What are those types of projects?

A. The Company has typically targeted overall capital investment (re-investment) between $8 million-$12 million per year. The Company is limited to investing no more than around $11.5 million per year in total capital expenditures due to the limits on the maximum amount that it can fund annually through its Fixed Asset Line of Credit

("FALOC") during construction. The FALOC is subsequently re-financed annually to long-term debt by issuing bonds using the New Hampshire Business Finance Authority as its conduit to the tax-exempt and taxable bond markets.

These "other major capital project" investments are associated with vertical assets, including storage tanks, pumping stations, treatment facilities, source of supply, and process related improvements (SCADA, Asset Management, etc.). In some years there may be more need for horizontal asset investment (main replacements) rather than vertical assets. In other years the opposite may be true. The balancing of these focused objectives is necessary to maintain a balance between timely replacement of aging infrastructure, while also keeping water rates from increasing too quickly, in order to fund those incurred costs.

Q. What were the other major projects completed in 2023?

A. The following projects are representative of the major capital work completed in 2023.

<u>Meter Radio Replacement Year 3 (W/O# 2300445):</u> The Company replaced 2,800 radios in 2023 at a cost of $395,074.

<u>Twin Ridge CWS Interconnection (W/O#s 2208919 and 2300494) at a cost of $318,814:</u> The Twin Ridge project was financed in part by a loan from the NH SRF. The interconnection to the newly completed Plaistow Water System allows the company to purchase 100% of the system demand from Plaistow (See Order No. 26,673 (August 22, 2022) in Docket DW 22-033). This was determined to be the most cost-effective option compared to completing major reconstruction/replacement of the existing water treatment

and pumping facility. This facility was beyond its useful life and the existing treatment equipment could not effectively treat the poor water quality (hardness, iron, and manganese). In addition, the site/location offers no reasonably cost way to manage, treat, and dispose of treatment residuals (waste) on site. Residuals would have to be temporarily stored for transportation off-site for treatment and disposal.

Sweet Hill CWS Interconnection (W/O#s 2208920 and 2300493) at a cost of $399,116: The Sweet Hill project was financed in part by a loan from the NH SRF (See Order No. 26,673 (August 22, 2022) in Docket DW 22-033). The interconnection to the newly completed Plaistow Water System allows for a reliable backup and reliable source of supply should the existing two bedrock wells of limited capacity suffer a failure or are impacted by groundwater contamination. The Sweet Hill system has been subject to complete outside water use restrictions for the past several years. This supplemental source will allow customers a modest amount of use for outside purposes with close monitoring and relaxed restrictions.

Year 1 Risk and Criticality Assessment (W/O# 2303591) at a cost of $59,073: This is an ongoing effort to characterize pipeline infrastructure by modeling the potential for failure based on multiple influencing factors including break history, environmental conditions, freeze/thaw potential, the presence of corrosive soils, pipe age, pipe material, and proximity to other utilities. This information is then combined with the consequence resulting from a failure for a risk ranking to be developed for each segment of pipe. This information will be used to further refine and adjust future replacement plans.

Merrimack River Intake Inspection (W/O# 2306150) at a cost of $31,000: The Merrimack River Intake went into service in 2019. This inspection is the first inspection completed on the intake and the surrounding river bottom and sediment conditions since the intake went into service. The intake had to be visually inspected by an underwater dive team. The inspection revealed that the corrosion protection (cathodic protection) system was not fully protecting certain components of the intake and associated equipment. The inspection also revealed that some couplings restraining the air-burst cleaning piping had failed and the remaining ones require replacement and improved corrosion resistance and protection. In addition, there is sediment building up on the downstream end of the intake (in the wake zone) and should be removed and mitigated. The presence of the sediment warranted a broader bottom or bathymetric survey of the area around the intake to determine if sediment conditions have changed in the general area around the intake. No significant changes were discovered other than the buildup of sediment downstream as mentioned above. Repairs to the couplings, upgrades to the cathodic protection system, and sediment mitigation could not be completed by the end of 2023 due to very high river flow. These repairs will be completed in 2024 when river conditions are more favorable.

GIS Software Migration (WO#) at a cost of $180,053: The Company initiated and completed its transition from what is called a Geometric Network to a Utility Network platform. ESRI has announced that Desktop will no longer be supported after March 1, 2026. In addition to that, there will be no more updates to Desktop after version 10.8.1, which was released in August 2020. Given the fact that there will be no more updates to

the Desktop software, and all updates and enhancements will be made in Pro, transitioning prior to 2026 will now allow continued development of our GIS and Asset Management system without having to redo changes and modifications that are made between now and 2026.

Water Treatment Plant Security Camera Installation (W/O# 2301514) at a cost of $69,450: and Distribution Facility Security Cameras and Intercom Additions/Upgrades (WO# 2303260) at a cost of $62,158: These two projects follow along with recommendations from the American Water Infrastructure Act (AWIA) Risk and Resiliency Assessment (RRA) and the Emergency Response Plan (ERP). The cameras and associated technology provide for additional monitoring of these two critical facilities as well as enhance worker safety.

Clicksoft Scheduling/Appointment Software Replacement (W/O# 2301991) at a cost of $332,697: The Company's scheduling, customer appointment, and work management software went unsupported at the end of 2023. In early 2023, the Company evaluated several replacement software packages for Clicksoft to determine the one that met the current functional needs of the Company, as well as, the software that would offer flexibility to adapt to changes in work activity and work flow going forward. The Company selected the Salesforce software to replace Clicksoft. The cost included the initial purchase of the software license and the internal and external labor to implement the software, including necessary customizations, to transition all customer data and functionality from Clicksoft to Salesforce. The implementation was complete in 2023.

Carbon Filter Media Replacement (W/O# 2303772) was completed at a cost of $595,577: In order to ensure compliance with the NHDES standard for perfluorooctanoic acid (PFOA) of 12 parts per trillion (ppt), the Company replaced the granular activated carbon filter media in filters 5A through 6B due to breakthrough of PFOA in the filter effluent.

Bowers Dam and Spillway Final Design (W/O#s 2301306 and 2306145) at a cost of $27,589: The final design of improvements to the Bowers Dam and Spillway was completed including plans and specifications that were ready to be bid. Project bidding and construction has been delayed due to the long lead time for the delivery of the spillway gate and structure, as well as, the availability of $700,000 of federal grant funds which will cover about 25% of the project costs. The federal funds were not available until the end of 2023 No construction can start until those funds were secured; Therefore, this project has been deferred to 2024 to construct the project within a single year. The costs incurred in 2023 are associated with the response to the FEMA grant requirements and some project redesign to accommodate the requirements for the FEMA grant.

Chemical Feed and Storage Evaluation (W/O# 2301360) at a cost of $48,785: The project is an engineering evaluation of existing chemical feed and storage system at the Company's main water treatment facility in Nashua, NH initiated in 2022. The existing facilities were placed into service prior to 2009. Since 2009, the Company has seen an increase in treatment chemical use due to changing water quality due to

environmental/climate conditions, as well as, a shift from Pennichuck Brook to the Merrimack River as the primary source of supply due to elevated levels of PFOA above the NHDES standard. The Company engaged the consulting firm of CDM Smith to evaluate and make recommendations, if any, for the Company to follow to ensure that chemical feed and storage facilities are adequate and in compliance with NHDES regulations. The treatment chemical of most concern is the primary coagulant ferric chloride. The Company has seen a near 40% increase in the volume of ferric chloride on average to treat current water conditions since 2012. It appears that the trend of increased chemical will continue to increase in the near term. At this rate of use, the required volume of chemical storage at the water treatment facility is less than required by NHDES drinking water standards. The CDM Smith evaluation concluded that additional storage is required. In addition, the pumps that feed chemical into the treatment process are undersized for the anticipated demand and will need to be upsized. The Company will be pursuing the design and permitting of new and/or expanded chemical feed and storage facilities to meet current and future demand and raw water quality as well as to ensure regulatory compliance.

Q. Please identify and describe other projects planned for 2024 - 2026.

A. The selected projects are the more significant non-water main projects described by year below as follows:

2024 Projects:

Meter Radio Replacement Year 4 (Budget $364,000): In 2024, the Company will continue the process of replacing approximately another 2,800 customer meter radios that are at or approaching their useful life.

Replacement of a Hydrant Crane Truck (Budget $225,000): This will replace a 2011 piece of equipment that has seen increased repairs to critical systems including crane hydraulics and is experiencing decreased reliability.

New/Replacement Foreman's Truck (Budget $300,000): This purchase will replace an existing 2018 vehicle with a poor and costly maintenance history as well as reliability issues. The budget includes fit up with new and replacement equipment as well as reuse of many existing pieces of equipment transferred from the retired vehicle.

AWIA RRA – ERP Projects (Budget $35,000): The company will be completing assessments of the recommendations derived from the RRA-ERP to prioritize improvements that result in risk mitigation and improved emergency response. These may include but limited to:

- Security enhancements at remote facilities including locks, alarms, security lighting, cameras, fencing, etc.
- Redundancy improvements/additions such as back up pumps, portable pumps and generators, or water main improvements
- Computer hardware and software upgrades and enhancements
- Cybersecurity initiatives

- Structural enhancements to building structures to withstand extreme weather events
- SCADA system improvements including a possible transition from radio telemetry to more reliable communication technologies.

English Woods Alternative Source Interconnection (Budget $350,000): This project will be the completion of an interconnection water main from the Company's Powder Hill system to the English Woods CWS in Bedford. The English Woods CWS is served by bedrock wells that have limited capacity (there is a water restriction history at English Woods) and lack redundancy during maximum day conditions. There is no available land to install additional wells in a different aquifer. The interconnection watermain will connect from the Company's existing Powder Hill water main on Donald Street and run approximately 2,300 linear feet through a cross country easement to connect at the English Woods Station. Water from Powder Hill is purchased from Manchester Water Works (MWW). MWW uses chloramines to disinfect its water while chlorine is used at English Woods. Treatment equipment will be added to the English Woods Station to remove chloramines, in order for the Company to maintain using chlorine as its primary disinfectant.

Security Cameras at the Merrimack River Intake (Budget $35,000): The camera project is being completed as a result of the AWIA RRA-ERP evaluation to enhance security around the Merrimack River Intake. The project will also allow staff within the water treatment facility to monitor activity and take action to mitigate potential risks from

potential malevolent acts or other safety concerns to the facility and the water supply, as well as, monitor staff working at the facility.

Bowers Dam Spillway reconstruction/increase capacity (Budget $2,500,000): The project was designed in 2022 and was pushed to 2024 because of the availability of federal grant funding to partially fund the work. The Company plans to complete a reconstruction of the Bowers Dam spillway in response to a letter of deficiency issued by NHDES. The spillway reconstruction will increase the capacity of the spillway to ensure passage of the required flood flows and for more efficient operations of the overall required height of the dam spillway, as required by NHDES revised 100-year flows. The work will also include, depending upon the final analysis and design, enhancements to the earthen abutments to increase stability and ensure against overtopping during potential and designed for flood events.

Computer Network Disk Array Replacement (Budget $150,000):

The Company's core disk array, an HPE Nimble installed in 2018, has reached the industry-standard life expectancy for production loads of approximately five years. The Company is currently out of the manufacturer's warranty and under a third-party warranty that only covers parts. While the storage performance has met our needs, it is essential to address the aging hardware and risks it brings. The project offers the following:

• Replaces Aging Hardware: Our HPE Nimble hybrid flash array, which has been in service since 2018, is approaching the industry-standard life expectancy of five years for production loads.

• Provides for Warranty: The Company is currently operating without manufacturer warranty coverage and relying on a third-party warranty that only covers parts. This

leaves the Company vulnerable to potential downtime and increased repair costs in case of component failures.

• Upgrades Storage Performance: While the current array has effectively met the Company's storage performance needs, the evolving demands of our organization, including the need for faster data access and application responsiveness as the Company scale our operations, will be considered.

• Cost-Efficiency: Despite the initial cost-effectiveness of our existing array, we need to weigh this against the escalating risks and costs associated with aging hardware, including maintenance, repair, and downtime costs.

Benefits of Upgrading:

• Enables Performance Improvement: An all-flash array offers significantly faster data access times, leading to improved application responsiveness and overall productivity.

• Enhances Reliability: Flash storage's lack of mechanical parts reduces the risk of disk failures and associated downtime, ensuring higher system reliability.

• Provides Cost Savings: While the upfront cost is higher, all-flash arrays have a lower total cost of ownership over time due to reduced maintenance and energy consumption.

2025 Projects

<u>AWIA RRA – ERP Projects (Budget $120,000):</u> The company will be completing assessments of the recommendations derived from the RRA-ERP to prioritize improvements that result in risk mitigation and improved emergency response. These may include but limited to:

- Security enhancements at remote facilities including locks, alarms, security lighting, cameras, fencing, etc.
- Redundancy improvements/additions such as back up pumps, portable pumps and generators, or water main improvements
- Computer hardware and software upgrades and enhancements
- Cybersecurity initiatives
- Structural enhancements to building structures to withstand extreme weather events
- SCADA system improvements including a possible transition from radio telemetry to more reliable communication technologies.

Meter Radio Replacement Year 5 (Budget $364,000): In 2025, the Company will continue the process of replacing approximately 2,800 customer meter radios that are at or approaching their useful life.

Year 1, Nashua Water Treatment Facility Chemical Feed and Storage Construction (2025 Budget $6,000,000 for construction and $1,000,000 for engineering of the overall Budget $11,000,000): This is a gross estimate of the construction of the improvements to the water treatment facility chemical feed and storage systems based upon the completed design evaluation/study of 2023. The project anticipates a major building expansion to house chemical bulk storage and additions/improvements to chemical feed pumps, controls, monitoring, and piping. The budget is a high level "place holder" estimate, which will be revised as needed when the final design is completed in 2024. Since this

project is a "one time" special project outside of the normal capital work completed annually by the Company, it will be funded via a special bond issuance or funding through the NH Drinking Water and Groundwater Trust Fund consistent with the size and scope of the project and the construction schedule that will take two years, for which the Company will be preparing and filing a Financing approval docket with the Commission, when the final estimated project amounts and timing is known and measurable for this major multi-year project.

In addition, 2025 may see several station upgrades to address/treat PFAS contamination at the anticipated EPA limits. Several of these facilities are included in the 2026 budget as a placeholder.

2026 Projects

Meter Radio Replacement Year 6 (Budget $364,000): In 2025, the Company will continue the process of replacing customer meter radios that are at or approaching their useful life.

Year 2, Nashua Water Treatment Facility Chemical Feed and Storage Construction (2026 Budget $4,000,000of the Overall Budget $11,000,000): This is a gross estimate of the construction of the improvements to the water treatment facility chemical feed and storage systems based upon the completed design in 2024 and bidding the project in 2025. The project anticipates a major building expansion to house chemical bulk storage and additions/improvement chemical feed pumps, controls, monitoring, and piping. The

budget is a high level "place holder" estimate, which will be revised as needed after bids are received in 2025.

In addition, 2026 may see several station upgrades to address/treat PFAS contamination at the anticipated EPA limits. Several of these facilities are included in the 2026 budget as a placeholder.

Q. Does this conclude your testimony?

A. Yes.