STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

RE: PENNICHUCK EAST UTILITY, INC.
DW 21- ___

2021 QUALIFIED CAPITAL PROJECT ADJUSTMENT CHARGE FILING

DIRECT TESTIMONY
OF
John J. Boisvert

February 11, 2021

Professional and Educational Background

Q. What is your name and what is your position with Pennichuck Water Works, Inc.?

A. My name is John J. Boisvert. I am the Chief Engineer of Pennichuck Water Works, Inc. ("PWW"), which provides services to Pennichuck East Utility, Inc. ("PEU" or the "Company") pursuant to a management allocation agreement. I have worked for PWW since February 1, 2006. I am a licensed professional engineer in New Hampshire and Maine.

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 have 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.

Q. What are your responsibilities as Chief Engineer of the Company?

A. As Chief Engineer, I manage and oversee the Company's Engineering Department. I lead the Company's Asset Management program. I, as head of the Engineering Department, am 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 is the purpose of your testimony?

A. I will be providing details of the major capital projects planned and budgeted for 2021-2023 as part of the Company's 2021 Qualified Capital Project Adjustment Charge ("QCPAC") filing. This testimony will also present the major QCPAC projects initiated and completed in 2020, as well as proposed projects for 2021, 2022 and 2023. My testimony supports, and is in addition to, testimony being

provided by the Company's Chief Operating Officer Donald L. Ware for this docket. Detailed project listings mentioned in this testimony are detailed in Mr. Ware's testimony (Exhibit DLW-1 Pages 1 – 5).

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 treatment facilities, pumping facilities, storage tanks, water main replacements, valve and hydrant replacements, building facility improvements and refurbishments, equipment purchases as well as non-structural efforts to improve Company performance, such as engineering studies. These generally include:

- The replacement of infrastructure that has reached the end of its useful life, does not achieve the level of service required of it (water quality, capacity, and efficiency), or the Company's ability to properly maintain it (outdated/lack of repair parts, etc.) is either impractical or more costly than replacing it.
- Infrastructure upgrades to improve system performance.
- Investments to ensure compliance with the primary and secondary Safe Drinking Water Act standards.
- Replacement of meter reading radios.
- Engineering studies and evaluations to assess infrastructure and system performance to aid in planning future capital investment needs.

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?**

A. The Company considers a number of factors in developing a capital budget for water main rehabilitation, replacement, and/or new construction. The Company has completed the first phase of its Asset Management Initiative. The Company has inventoried its pipeline assets and documented them within the GIS system. An initial condition assessment and a preliminary evaluation of the consequence of failure of certain water main assets has been completed. The effort thus far is serving as an effective tool to determine which assets are most critical and should be evaluated in more detail for possible inclusion in the current 2020 – 2022 capital budget. During 2020 and 2021, upon the transition to a new Computerized Management and Maintenance software, the Asset Management Initiative will be expanded to look more closely at specific assets to identify the risk of failure, whether there is a structural failure (break) or the asset is not attaining the required level of service (water quality, flow, or pressure) to guide future capital expenditures. The 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 replacement projects;
- Geographic grouping of streets where mains are to be replaced/rehabilitated for improved efficiency by keeping work in close proximity;
- 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, to replace water main where substandard plastic water pipes are present. There are cost savings in pavement repair and traffic control associated with completing projects while the municipality or other utility company is working on a street.
- Industry guidelines of the American Water Works Association for the replacement of water main 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 reasonable until the Asset Management System allows for a more system/asset specific assessment to be performed. While all of the Company's water mains are less than 60 years old, a portion of those water mains are substandard plastic water mains that were installed by the original developer prior to the NHDES setting minimum standards on water main materials. As such those plastic water mains break with much greater frequency than water mains constructed of today's approved materials. By example, the break per mile on substandard plastic (Sch 40 PVC, 100 psi HDPE or PB – 496 breaks on about 68 miles of substandard

plastic over the past 23 years) is about 7.2 per mile versus 0.16 breaks per mile on ductile iron pipe (51 breaks on about 324 miles of DIPCL) over the past 23 years, or about 45 times greater in frequency.

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 were the major water main projects completed in 2020?

A. The following projects were completed in 2020:

Rolling Hills CWS – Plaistow

The Company replaced an estimated 755 LF of substandard 2-inch plastic pipe with 794 LF of 6-inch DICLP. The original 2-inch pipe (constructed in the 1970's long before PEU ownership) ran through private property and under a deck and other out structures of the property owner. The original pipe leaked and could not be readily repaired due to the proximity of the private structures. The Company constructed the new water main within the public roadway and reconnected house services to the new water main. The original 2-inch pipe was retired from service. The project costs in 2019 were approximately $188,000. An additional $27,400 was spent in 2020 on site restoration and pavement repair.

Locke Lake CWS ($1,328,000)

The Company completed final site restorations for water main replacements on the following locations:

- Georgetown Drive: Replaced 4600 LF of 4-inch schedule 40 PVC with 6-inch C900 PVC

- Bradford Lane: Replaced 1825 LF of 4-inch schedule 40 PVC with 6-inch C900 PVC.

The Georgetown Drive watermain was used and useful in 2019 and initially recovery of the P&I associate with the invested capital was sought in DW20-019, but later withdrawn from the Docket as the NHDES SRF funding will not convert from short term to long term financing until June of 2021.

Additional water main construction was completed at the following locations:

- North Barnstead Road: Added 680 LF of 4-inch C-900 PVC to eliminate dead end and replaced 275 LF of 4-inch sch 40 PVC with 6-inch C900 PVC
- Belmont Drive: Replaced 500 LF of 4-inch schedule 40 PVC with 6-inch C900 PVC.
- Route 28: Replaced 720 LF of 2-inch PE with 720 LF of 4=inch C-900 PVC

The Belmont Drive and North Barnstead Road watermains were used and useful in 2019 and initially recovery of the P&I associate with the invested capital was sought in DW20-019, but later withdrawn from the Docket as the NHDES SRF funding will not convert from short term to long term financing until June of 2021.

<u>Pelham Water Main Replacement – Monticello and Lane Area Phase 1 ($595,046)</u>

The Company replaced several sections of small diameter substandard pipe in the Williamsburg Community Water System in Pelham, NH. The replacement was in response to mains lacking capacity, to correct a system lacking

distribution valves such that emergency or planned shutdown impacted a significant area of the water system, well above normal break history (9.9 breaks per mile of water main; 105 breaks since 1998), replacement of a direct buried pressure reducing valve that was unable to be services and lacked sufficient capacity, and to increase the capacity of the piping ahead of the future Phase 2 water main replacement in 2023. The specific Phase 1 work completed is as follows:

- Monticello Road: Replaced 1600 LF of 3-inch PE with 12-inch C-900.
- Lane Road: Replaced 1000 LF of 3-inch PE with 12-inch C-900.
- Simpson Road: Relocated an existing hydrant and added 70 LF of 12-inch C-900.
- Andrea Lane: Added 60 LF of 12-inch C-900.
- Mount Vernon Drive: Replaced 140 LF of 3-inch PE with 12-inch C-900 and replaced undersized 2-inch pressure reducing valve with an appropriately sized 8-inch and 2-inch valves inside a service access vault.

<u>Locke Lake Source of Supply/Treatment Projects</u>

The Company broke ground on upgrades and additions to the water supply and treatment capacity of the Locke Lake Community Water System (Locke Lake). In 2020, the Company completed the design and permitting of a new surface water source of supply (Webster Stream) and treatment system at the existing Peacham Road Treatment Facility. This project is the result of investigations and

analysis over a two-year period in response to a significant deficiency identified by the NHDES. The existing Locke Lake well capacity could not keep up with existing customer demands even with full outside water use restrictions. The new surface water source will operate from October through June of each year, as authorized by the Water Quality Certificate issued by the NHDES. The surface water source will supply water when stream flows are generally plentiful during the winter and spring. This will allow the existing wells to rest and groundwater levels to replenish ahead of summertime demand when groundwater recharge is not occurring. This project went used and useful in December 2020; however, project close out items such as painting, structural finish work and site restoration will carry over into 2021. The project included three distinct but related projects and were competitively bid in that fashion. The three parts of the project were the following:

- The raw water infiltration gallery (intake) in Webster Stream, the raw water pumping station, and the raw water transmission pipeline to the Peacham Road Treatment Facility. ($268,920)
- The expansion of the Peacham Road Treatment Facility to house chemical storage/feed system including containment, ventilation to code, and required worker safety provision. This project also included a new residuals settling basin and infiltration lagoon for the new surface water treatment system. ($200,527)
- The addition of a new 150 gallon per minute ultra-filtration membrane system to treat the raw water from Webster Stream along with other

supporting components including equalization tanks, residuals handling equipment, chemical feed equipment, water quality monitoring equipment, electrical system upgrades, SCADA system upgrades and expansion, as well as structural improvements to accommodate the new treatment process. ($1,743,647)

The Company completed another source water related project in 2020 associated with the Locke Lake Airstrip Well. The Airstrip Well operated as an independent source separate from the wells that feed into the Peacham Road Treatment Facility. The Airstrip Well had its own arsenic treatment system using adsorptive media as opposed to the Coprecipitation process used at the Peacham Road Treatment Facility. The use of Coprecipitation to remove the arsenic will save about $28,000 in treatment costs from the 2020 expenses associated with arsenic removal via adsorptive media. With the change in the arsenic standard from 10 ppt to 5 ppt, the cost of the adsorptive media treatment would almost double from about $40,000 to $80,000 per year resulting in additional long-term savings. The analysis showed that the Company could reconfigure the Airstrip Well to pump to the Peacham Road Treatment Facility via a new pipeline directionally drilled under Locke Lake. The Company sought and the Commission approved a license to allow the crossing under Locke Lake (see DW 19-198). This project was completed in the first half of 2020 but had to wait until December for improvements to be complete at the Peacham Road Treatment Facility before it could go into service. ($618,531)

One final project was completed at Locke Lake in 2020. The existing iron, manganese, and arsenic filters suffered a significant failure of the internal screens and supports that contain the filter media. The failure was not repairable, and the filters were no longer functional. The Company initiated the installation of a temporary arsenic filtration unit, as well as it continued to truck water into the system to minimize the impact of arsenic going into the distribution system to maintain compliance with the arsenic standard. The existing filters were removed, and the Company purchased new filters and installed them with the assistance of the Contractor that was installing the new membrane system. The replacement groundwater filters were placed into service on or about December 24, 2020. The NHDES authorized use of already approved SRF funds to pay for some of the cost and the balance was paid for with CoBank financing. ($140,348)

Q. Please identify and describe water main projects planned for 2021, 2022, and 2023.

A. Planned water main replacements and additions are listed below by year.

<u>2021 Water Main Replacements/Additions</u>

There are no planned distribution water main replacements in 2021. The 2021 Capital expenditures are more focused upon the Londonderry Storage tank and pumping/treatment station upgrades and replacement. Those activities will be discussed later in this testimony.

2022 Water Main Replacements/Additions

Gage Hill CWS

The Gage Hill water system in Pelham, NH is another system the Company acquired with substandard small diameter plastic pipe. The system has experienced 35 breaks over the past 5 years (43 breaks per mile of watermain). Those leaks have impacted service to the customer and present risk of contamination due to depressurization. The project will replace mains at the following locations.

- Wellesley Drive: Replace 1760 LF of 2-inch PE with 1760 LF of 4-inch C900 PVC
- Radcliffe Drive: Replace 720 LF of 1.5-inch PE with 720 LF of 4- inch C900 PVC
- Vassar Drive: Replace 1740 LF of - inch PE with 1740 LF of 4-inch C900 PVC

The estimated budget for this project is approximately $590,000.

2023 Water Main Replacements/Additions

Pelham Main Replacement - Monticello & Lane Area Phase 2 ($900,000)

- Lane Road: Replace 2,900 LF of 3-inch PE pipe with 3,600 LF of 6-inch C-900 PVC that will eliminate dead end mains and cross-country main running behind private homes.
- Monticello Drive: 1,960 LF of 3-inch PE pipe with 6-inch C-900 PVC. This work will also enable the elimination of existing pipe that runs cross-country behind private residences.

- Mammoth Road: Replace 1,660 LF of 3-inch PE pipe with 12-inch C-900 and add 510 LF of 12-inch C-900 to eliminate dead ends on Lane Road and facilitate the elimination of existing pipe that runs cross-country behind private residences.

The Company will be applying to the NH SRF for loans and the NH DWGTF for loans and grants to fund water main projects once the application process opens each year (May and June) for projects planned in 2022 and 2023.

Q. Your testimony states that water main replacement varies each year (2021-2023) due to balancing the investment in water main replacements with other major capital projects. What are those projects?

A. These 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 rather than vertical assets. In other years the opposite may be true. The balancing is necessary to keep rates from going up too quickly. A large vertical asset can consume most of the targeted PEU capital investment dollars and result in the Company delaying a horizontal project for a number of years to lessen rate impacts.

<u>2021 Vertical Projects</u>

<u>Atkinson CWS Station Reconstruction</u>

The Company has budgeted $630,000 (budget has $30,000 for design in 2021 and $600,000 for Station rebuild in 2022) to reconstruct an existing water

pumping and storage facility that serves a limited area in the Town of Atkinson. The station pumping and piping equipment are beyond the design life and have deteriorated where replacement is necessary. The storage tanks are buried steel and show signs of significant corrosion. The tanks need to be replaced. Finally, the station is required to provide limited fire protection. Existing storage volumes and pumping equipment are not capable of providing the required fire protection flows.

Londonderry Core, Londonderry, NH

The Company had planned to replace Gilcrest Road Pressure Reducing Valve (PRV) Pit in 2019. The pit is a converted below ground vault that was installed in the late 1980's. The internal piping is corroded, and several leaks have been repaired. The PRV's in the pit reduce the pressure from the elevation 620 foot pressure zone down to the 498 foot pressure zone in the Londonderry Core. The addition of a second PRV vault, as part of the Woodmont Commons development will replace the Gilcrest PRV pit. The change in how water will be fed into the Londonderry system, as discussed below, provides system redundancy and eliminates the need to rebuild the Gilcrest PRV pit.

The Company planned to design and permit a 1.25 million gallon water storage tank to address water supply capacity shortfalls in the Londonderry Core system, as documented by the NHDES in their Sanitary Survey dated January 9, 2018. The private development is prepared to contribute 51% of the cost of the tank. Additionally, the construction of the tank will reduce the Company's purchased cost of water from Manchester Water Works by about $70,000 per year. The

Company sought and received, through its petition to the Commission (DW 18-101), an approval of a Special Contract with a private entity, Pillsbury Realty Development, LLC ("Pillsbury") for Pillsbury to fund approximately 51% of the project cost. Pillsbury's contribution is the result of their impact on the Londonderry water system from a significant development (Woodmont Commons) that Pillsbury is constructing. The elevated tank required a variance due to its height at the location where it was to be constructed. Unfortunately, the Londonderry Zoning Board of Adjustment denied the variance in November 2019. Since the denial of the variance, PEU has engaged the services of an engineering consultant to assess other water supply storage and distribution options to achieve the objectives of the original elevated storage tank project and assess the relative costs. During this evaluation process, PEU engaged in discussions with Town of Londonderry staff, our consultants, and NHDES to advise local officials of the need to make system improvements of which the most technically feasible options include water storage to meet existing water demand conditions regardless of Woodmont Commons. In addition, PEU met with representatives of Pillsbury to present system improvement options that achieve PEU's responsibilities as the public water utility and meet the needs of the Woodmont Commons development consistent with the Special Contract approved by the Commission in Order 26,285. During these discussions, a number of opportunities were discovered or offered by Woodmont Commons that advanced technical alternatives previously unavailable to PEU and would result in similar rate impact to the elevated tank option (originally identified as the "least

cost option"). PEU filed a petition detailing this alternative (see DW 18-101) to present a new alternative consisting of a ground level storage tank, transmission main, and water booster pumping station. This alternative revised the project scope but is consistent with the cost sharing arrangements with Pillsbury in the Special Contract approved in Order No. 26,285.

The Company hopes to complete the project (used and useful) in 2021. However, depending upon the timing of local permits (Planning Board) and re-approval of the Special contract by the Commission. The project may take 12 to 18 months to complete depending upon when construction can start and could be delayed to 2022. The Company estimates its total project expenditure to be $1,600,000. The project will be financed through CoBank. Once the Project is completed, the Company projects its purchased water costs from Manchester Water Works to the Londonderry Core to be about $70,000 per year less than before the tank was constructed.

<u>2022 Vertical Projects</u>

Atkinson CWS Station Reconstruction

The Company has budgeted $630,000 (budget has $30,000 for design and $600,000 for Station rebuild) to reconstruct and existing water pumping and storage facility that serves a limited area in the Town of Atkinson. The reasons for the station replacement were detailed earlier in this testimony.

2023 Vertical Projects

There are no major vertical capital projects planned for 2023 at this time.

Q. Are there other capital expenditures completed in 2020 and/or proposed for 2021, 2022, and 2023 that the Company plans to complete?

A. Yes. The Company has a number of routine capital activities that are not classified as "major" but are necessary to operate the business and serve our customers. Some examples are as follows:

- The Company carried budgets for well rehabilitation, pump replacements, SCADA improvements, security enhancements, along with other treatment and pumping equipment. The Company also budgets a number of hydrant, valve, and service (main to stop) replacements each year.
- The Company will begin the process of replacing customer meter radios that are approaching the end of their useful life. The project is anticipated to take seven years complete resulting in radios being replaced between year 15 and 21 of their lives. All the radios in question were installed in 2007 and are warrantied for 10 years. Annual radio failure rate has increased from about 0.5% per year to just under 2% per year. The plan is designed to avoid mass failure of the radios. Replacing radios at the time of failure results in an estimated meter read and a special trip to the location of the failed radio to complete the radio replacement. On average (based on system geography), the average time for a single radio change out (inclusive of travel) in PEU is about 2 hours in remote systems, or about $230 per replacement. This is

opposed to a dedicated, planned replacement program where all radios in a remote area are replaced at once with one trip versus individual trips where the time spent per radio replacement is no more than 15 minutes per radio, resulting in a replacement cost of about $125. Extending the replacement plan over 7 years will allow the Company to view radio failure rates for radios between 15 and 22 years old and allow a better timing of the next set of radio replacements, while further spreading the radio replacements out over a longer period of time than the original single year implementation. The 2021 budget for this effort is $130,000. This work will continue into and be further budgeted in 2022 and 2023 at $130,000 per year.

These Capital expenditures will be funded through a loan from CoBank.

Q. Does this conclude your testimony?

A. Yes.