STATE OF NEW HAMPSHIRE

BEFORE THE

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

RE: PENNICHUCK WATER WORKS, INC.

DW 10-091

# PRE-FILED DIRECT TESTIMONY

OF

DONALD L. WARE

MAY 2010

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**DW 10-091**

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**Professional and Educational Background**

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

A. My name is Donald L. Ware. I am the President of Pennichuck Water Works, Inc. (the "Company"). I have been employed with the Company since April 1995. I am a licensed professional engineer in New Hampshire, Massachusetts and Maine.

**Q. Please describe your educational background.**

A. I have a Bachelor in Science degree in Civil Engineering from Bucknell University in Lewisburg, Pennsylvania. I have a Masters in Business Administration from the Whittemore Business School at the University of New Hampshire.

**Q. Please describe your professional background.**

A. Prior to joining the Company, I served as the General Manager of the Augusta Water District in Augusta, Maine from 1986 to 1995. I served as the District's engineer between 1982 and 1986.

**Q. What are your responsibilities as President of the Company?**

A. As President of the Company, I am responsible for the overall operations of the Company, including water quality and supply, distribution, engineering and water system capital improvements. With regard to capital improvements overseen by the Company's Engineering Department, I work directly with the Company's Chief Engineer and each of the Company's Department managers in the selection and implementation of new capital improvement projects.

**Q. What is the purpose of your testimony?**

A. I will be providing details of the Company's capital expenditures that were made in 2008 and during the test year and are included in the Company's rate request. I will also describe non revenue producing capital improvements that will be made in 2010 that form the basis for the Company's request for a step increase for assets being placed into service as of December 2010. I will also provide testimony supporting the Company's request for a Water Infrastructure and Conservation Adjustment (WICA) charge.

**Overview of Capital Expenditures**

**Q. Did the Company make capital expenditures during 2008 that were not part of the step increase in rates granted by the Commission in DW 08-073?**

A. Yes. The Company made capital expenditures in 2008 that were not included in the Company's last rate case, DW08-073. By way of background, in the Company's last rate case, the Company was awarded a step increase for significant additions to the Company's water treatment plant that were placed into service during 2008 and early 2009. These additions included the rebuilding and upgrading of two of six filters (filters 4 and 5) at the Company's water treatment plant, and the replacement of the Fifield tank.

**Q. How much did the Company spend, in total, for capital expenditures during 2008 that was not captured in the step increase granted as part of DW 08-073?**

A. The Company added $2.6 million of new non CIAC assets that were not included in the step increase granted in DW08-073 (excluding retirements). Of the total, approximately $1.3 million was invested in the installation of radio meter readers.

This investment will be described in more detail later in my testimony. The remaining approximately $1.3 million was invested primarily in maintenance capital for mains, meters, services, hydrants and vehicles.

**Q. How much did the Company spend, in total, for capital expenditures during 2009?**

A. The Company added $12.0 million in new assets during 2009 of which $8.0 million were not included in the step increase granted in DW 08-073 (excluding retirements). Of the $8.0 million in additions, $6.8 million of those assets were non revenue producing assets.

**Q. What do you mean by non-revenue producing assets?**

A. Non-revenue producing assets are related to projects that do not result in new customers or additional revenues to the Company. Examples of typical non-revenue producing projects are projects that are the result of government regulations such as the Safe Drinking Water Act (SDWA), the City of Nashua's sanitary and storm water separation project sometimes referred to as the combined sewer overflow project (CSO), City and State road reconstruction projects and other State or Federal mandates. Capital expenditures to enhance customer service or replacements of aging infrastructure are also examples of non-revenue producing projects.

**Q. Are all of the capital expenditures completed during 2008 and 2009 (and described further below) currently used and useful?**

A. Yes.

**Q. What were the major focal points of the Company's capital projects in 2008 and 2009?**

A. The Company's focus continues to be multifaceted and included the completion of the water treatment plant reconstruction to insure compliance with all State and Federal Drinking Water Regulations, the replacement aging infrastructure, primarily water mains and services, completing water supply and water quality improvement projects for its community water systems and completing the installation of radio meter readers in the Company's core water system. The Company spent a total of $10.6 million on capital improvements within these areas during 2008 and 2009 that were not part of the step increase granted in DW 08-073. Each of the major project areas for 2009 is described in more detail below.

**SDWA Compliance Capital Expenditures**

**Q. Can you please describe the work that the Company completed during 2009 at the Water Treatment plant in order to maintain compliance with the Safe Drinking Water Act (SDWA)?**

A. Yes. The projects listed below were completed as part of the Water Treatment plant upgrades during 2009 in order to meet SDWA requirements:

1. The last of the plant's six water filters was rebuilt.
2. The second of two pulsators was rebuilt.
3. Plant Security was enhanced to include fencing and new cameras to put the plant's security measures in compliance with the recommendations of the vulnerability assessment completed for the US EPA.

**Q. How much did the Company invest in the above referenced improvements to the water treatment plant during 2009?**

A total of $4.3 million was expended by the Company during 2009 to complete the upgrades to its water treatment plant. The costs of the projects described above are included in the asset detail on Schedule 3, Attachment A, Exhibit 2.

**Q. In your testimony in DW 08-073, you referenced Contract 6 which entailed the rebuild of the Merrimack River Intake. Did the Company complete the rebuild the Merrimack River Intake?**

A. Yes. The Company bid the construction of the two new 350 HP pumps to be used at the Merrimack River Intake in February of 2008. The installation of the new pumps increased station capacity from 16.8 to 22.0 MGD. The station upgrade also increased the station capacity, with the largest pump out of service, from 11.6 MGD to 22.0 MGD. The station was completed and operational in July of 2009. The final cost of the Merrimack River Intake rebuild was just over $0.6 million.

**Other Capital Improvements**

**Q. Can you please describe the other types of capital improvements that Pennichuck completed in 2009?**

A. Yes. The Company spent a total of $1.0 million to replace aging water mains, services, valves and hydrants in 2009. This work resulted in the replacement of 66 steel water services and 3,616 lineal feet of water main during 2009.

**Q. The amount of water main replaced in 2009 was substantially less than the Company has replaced in the past. What is the reason for this and what are**

**the Company's plans in the future relative to the replacement/rehabilitation of water main?**

A. The Company installed less replacement water main in 2009 for several reasons. First, the City of Nashua did not have an active CSO or Sewer replacement program during 2009. Consequently the planned joint water and sewer replacement projects that had helped reduce paving costs associated with water main replacement projects for the Company in previous years was not available. The City has restarted both its CSO and sewer main replacement work in 2010 and the Company is partnering with the City on those projects. The scope of the coordinated Company and City projects in 2010 is discussed later in my testimony.

Q. **Please describe the water supply and water quality projects completed during 2009.**

A. The Company spent over $0.8 million in 2009 on new and replacement equipment for projects to maintain or improve water quantity or and/or water quality.

Q. **Please describe the major water quantity projects.**

A. The largest water quantity projects involved developing new sources of supply for the Sweet Hill and Twin Ridge Community Water Systems. The Company spent $0.2 million to locate and develop a new well for Sweet Hill to improve the output of the existing Twin Ridge wells and to activate an existing well at Twin Ridge that had not been in use since 1998.

Q. **Why were these projects necessary?**

**A.** Both the Twin Ridge and Sweet Hill water systems had been under total irrigation bans in each of the past two years (2008, 2009) due to a shortage of well production. The new wells will allow these systems to allow for odd/even irrigation practices to occur. Additionally, there was only one well at Sweet Hill. If the well pump or well failed at any point in time the system would have been out of water without a back up well.

**Q. Please describe the major water quality projects.**

**A.** There were two major water quality projects completed during 2009; one project involved installing iron and manganese treatment at the Autumn Woods Community Water System at a cost of $0.1 million and the other involved the interconnection of the Ashley Commons Community Water System with the Town of Milford water system via a 4,440 LF water main at a cost of just over $0.5 million. The final cost for Ashley Commons included approximately $19,000 for cost of removal of the existing pump house and capping of the existing well in accordance with NH DES regulations.

**Q. Please describe the need for the Ashley Commons interconnection with the Town of Milford water system.**

**A.** Please see the prefiled testimony of Donald L. Ware in DW 09-063 and Order No. 24,957, American Recovery and Reinvestment Plan of 2009 SRF Financing, which is incorporated herein by reference. In DW 09-063, the need and alternatives to this project were described in detail.

**Q. Did the Company complete the installation of radio meter readers in 2008 and 2009 that it discussed in DW 08-073? If so, please describe those investments.**

A. Yes. The Company has installed 25,476 radio meter readers into its water systems over the past three years. In total, the Company has invested $1.9 million in the radio meter reader project. The installation of radio meter readers has increased the average daily meter reading rate by a factor of over 10 and has resulted in a reduction in meter reading expense (labor and truck time only) of over $288,000 per year. The overall reduction in meter reading costs, including operating expenses, return on investment and depreciation expense resulting from the installation of radio meter readers is over $210,000 a year savings in meter reading costs when compared against the alternative of continuing to manually read (via outside touch pad technology) the existing meters. Continuing to complete manual touch reads would have required that over 75% of the existing touch read meters, that are the older style Neptune TTA meters with pin box readouts, would have to been replaced with TPA meters and outside touch pads if manual reading was to continue and was to be completed on a monthly basis.

**Q. What will the Company do with the meter reading labor that has been freed up via the use of radio meter readers?**

**A.** The reduced meter reading labor from quarterly meter reading, slightly over 1.1 FTE's, has been redeployed to complete the small meter periodic testing program with the goal of bringing the Company's small meter (5/8" and ¾") testing program into line with the Commission's testing time frame in Puc 605.04 of completing a

periodic test on a small meter every 10 years (2,754 meter per year across all three regulated water utilities).

**Q. The Company has experienced two Statewide power outages over the past several years, the first being the ice storm of December 2008 and the second being the wind storm of February 2010. After the first storm, the Company committed to a two year process of installing on site generators or manual transfer switches at all of its water systems in accordance with a plan presented to the Commission in 2009. Has the Company been proceeding with that plan?**

A. Yes, during 2009, the Company spent approximately $0.1 million in 2009 to purchase 4 additional portable generators, install a permanent 130 kW generator with an automatic transfer switch at its office located at 25 Manchester Street and to install manual transfer switches at four of its community water systems, Sweet Hill, Bedford Water Company, English Woods and Atherton Commons. The Company's 2010 Capital Expenditure plan includes the installation of on site emergency generators with automatic transfer switches at four of its community water systems by the early fall of 2010. The 2010 Capital expenditures plan also calls for the purchase of a portable emergency bypass pump to allow for pumping around several of the stations when there is a power outage. The installation of the four on site generators plus the purchase of the portable emergency bypass pump, in addition to the work completed in 2009, will finish the Company's plans for having emergency power available for its systems during a State-wide power outage.

**Q. Can you please describe the non revenue producing capital projects that the Company will be completing before the end of 2010 and what the benefits will be to the Company's customers?**

A. The Company will be completing an estimated $5.5 million in non revenue producing capital improvements in 2010, including $0.6 million cost of removal primarily related to main replacements and the removal of the Salmon Brook Dam. The projects and their benefits are as follows:

1. The Company plans to replace about 9,160 LF of unlined cast iron or steel water main in addition to cleaning and lining about 5,970 LF of unlined cast iron water main during 2010. The Company will be working jointly with the City (which will be performing combined sewer overflow or sewer replacement project) on about half of the water main replacement/rehab projects in order to minimize paving and road reconstruction costs as well as disruption to the impacted neighborhoods. These projects will reduce incidences of colored water, reduce the potential for bacterial regrowth and result in increased fire protection flows. The estimated cost to complete these projects is $2.5 million. $1.3 million of these projects is being funded with American Recovery and Reinvestment Act (ARRA) funds.

2. The Company will be completing an interconnection between the Drew Woods Community Water System and the Town of Derry Water System to provide for an adequate source of supply for the Drew Woods system. The projected cost of the Drew Woods interconnection is $1.2 million. The need for this project is detailed in DW 10-105, the Company's recently filed financing

petition for this project. This project will be funded with State Revolving Fund Loan money.

3. The Company will be constructing two storm water treatment facilities adjacent to Harris Pond in the vicinity of the intersection of the F.E. Everett Turnpike and Tinker Road in Nashua. The constructed facilities will treat storm water runoff from the Turnpike and from over 150 acres moderately developed residential land in Nashua before it enters Harris Pond. This project was the highest priority project identified in the Pennichuck Brook Restoration study that was completed in 2007. The estimated project cost is $350,000 with the NH DES providing an $187,000 grant toward the cost of designing and constructing of these storm water treatment facilities.

4. The Company will be installing emergency on-site generators with automatic transfer switches at its Great Bay, Woodlands, Redfield and Valleyfield Community Water Systems as well as purchasing a portable emergency bypass pump. These additions will enhance the Company's emergency response capabilities to a State-wide power outage. The estimated cost of completing these installations is $271,000.

5. The Company will be constructing an addition to the Taylor Falls Booster Station in order to accommodate the addition of a second back up pump inside the station. The Taylor Falls booster station delivers water to the Towns of Hudson and Litchfield during the spring, summer and fall. At present there is only one pump at this station, which is capable of meeting the Hudson and Litchfield water demands but if it fails, there is no back up pump to deliver water

to Hudson and LItchfield. The station was built under a contract with Consumers New Hampshire Water Company in 1995. Consumers were required by the NH DES at the time to provide an alternate source of supply to the Town's of Hudson and Litchfield, and to meet this obligation, Consumers contracted with the Company to construct this station as a back up. At the time the station was constructed, Consumers stated that it would never purchase water through this interconnection and they paid to build the least expensive station that would still meet the NH DES requirements for a back up connection. Since the construction of the station, the water demands in Hudson and Litchfield have grown substantially. In addition, the NHDES substantially reduced the permit for the amount of water that can be pumped annually from the Dame/Ducharme wells from over 1 MGD to 0.79 MGD. The net result of these two factors is that the Taylor Falls booster station has gone from pumping no water in 1995 to over 136 million gallons in 2007 (over a seven month usage period ) resulting in an average daily pump run time of 10.8 hours. At present, if the single pump in the Taylor Falls booster station pump fails, the Towns of Hudson and Litchfield would have to be placed on a total ban of all outside water usage to insure that the existing wells could meet the system demands and not exceed their NH DES permitted production limits. The estimated cost of this booster station addition is $155,000.

6. The Company will be installing iron and manganese removal as well as disinfection facilities at its Great Bay Community Water System. The water from the Great Bay wells has been untreated for the past ten years. Over the past

several years, this water system has had several positive coliform bacteria results during the monthly bacteria sampling. The source of the bacteria was traced back to one of the two active wells and removed by super chlorinating the well. The well chlorination only eliminated the bacteria for several months and then it returned. A video of the well indicated that the well casing and seal were in good condition and that surface water infiltration was not the source of the bacteria. After struggling with this issue for over a year and after three bacteria notifications to customers, the Company has determined that it should chlorinate the well water at Great Bay on a continuous basis. The addition of chlorine will result in the soluble iron and manganese that are present in the well water being oxidized and creating colored water. Therefore, the Company will be adding iron and manganese removal as a necessary part of the disinfection system. The estimated cost of adding these facilities is about $75,000.

7. The Company needs to replace its crane truck and one of its Backhoe Loaders. The existing crane truck is a 1997 vehicle and would no longer pass inspection due to significant body rot. The existing backhoe is a 1990 vehicle and also has significant body rot as well as a need to rebuild its hydraulic system. The estimated cost of replacing these two vehicles is $190,000. The Company bid all out vehicles among the area dealerships in order to attract the best possible pricing.

8. The Company will be investing about $87,000 in De-Duplication equipment as part of its Information Technology disaster recovery plan as required by Sarbanes-Oxley.

9. The Company needs to replace a 20,000 gallon atmospheric tank at the Glen Ridge Community Water System in Derry because the existing tank has reached the end of its useful life. There is significant corrosion on both the interior and exterior of the existing tank. The existing tank is cast into one wall of the Glen Ridge booster station and is integral to the station structure making its replacement more difficult. The Company will be replacing this single 20,000 gallon steel tank with two 9,000 gallon fiberglass tanks this summer. The estimated cost of this tank replacement project is $98,000 and is being funded with ARRA funds.

10. The Company will be completing the construction of the Armory Booster Station as was approved in DW 09-111. This booster station is being funded with green funds available through ARRA money. The estimated cost of this project is $300,000. The estimated power savings from this project have been proformed into the Company's rate case expenses as described in Ms. Hartley's pre-filed direct testimony in support of permanent rates.

**Q. Is the Company seeking to recover any of these investments made in 2010 as part of this rate case?**

A. Yes. The Company is requesting a step increase to recover the capital invested in the above referenced 2010 non revenue producing assets.

**Q. If the Company is allowed a step increase to recover the costs of the 2010 non revenue producing assets, are there any proforma adjustments that need to be made to the Company's expenses?**

A. Yes. The Company is seeking recovery of depreciation and property tax expense on the assets that are in service and used and useful. The Company is not requesting recovery of any additional operational expenses, other than purchased water from Derry that may result from the construction of the non revenue producing assets defined above. Finally, the project dollars presented above are estimates; final project costs will be subject to the Staff's audit.

**Q. Are all the capital expenditures made to date that are included in this rate filing prudent?**

A. Yes. As described above, all of the capital expenditures have been necessary for the operation of the Company's water system in a safe and reliable manner. In addition, the Company has undertaken a number of efforts to minimize the costs of these projects, including performing most of the engineering design, contract administration, management and inspection with its own staff. All projects are competitively bid to qualified contractors in order to attract the best possible pricing.

The Company believes that all of the capital expenditures completed by December 2010 and subject to the proposed step increase will be prudently incurred. These projects are also necessary for the operation of the Company's system and have been subject to the same cost containment measures as the investments made in 2008 and 2009.

**Q. You identified that one of the purposes of your testimony was to propose a WICA plan for the Company. Please explain what the Company's WICA plan is.**

A. The Company believes that it would be appropriate to establish a Water Infrastructure and Conservation Adjustment (WICA) charge (similar to the pilot WICA recently granted to Aquarion Water Company in DW 08-098) to allow for an ongoing replacement/rehabilitation program for its water systems aging infrastructure. A WICA would allow the Company to carry out a modest water main replacement/rehabilitation program and reduce the frequency of filing rate cases thereby reducing the costs passed through to its customers. It would also reduce regulatory lag that occurs between the installation of a water main (which is a non-revenue producing asset) and the capturing of that investment and the associated expenses (depreciation and property tax expenses) in rates. The Company has a number of concerns in creating a more timely return on its investment in water main replacement/rehabilitation projects in its system. It would also obviate the need for repeated rate cases, the cost of which would be expensive for the Company's customers. A calculation of the Company's water infrastructure replacement plan detailing the potential impact on rates is set forth in Exhibit DLW-1.

**Q. Please describe the basis for the Company's WICA plan.**

A. The Company has about 270,000 LF of unlined cast iron water main and about 27,000 LF of steel water main in its distribution system. The Company has developed a plan to replace or rehabilitate this water main over the next twenty to twenty five years or approximately 12,000 to 15,000 LF per year. A spreadsheet of recommended WICA projects for the next five years is attached to this testimony as Exhibit DLW-2. The Company has prioritized water mains based on

the following factors, with particular emphasis on coordination of work with the City of Nashua and the geographical proximity of projects:

1. Water Main Break History
2. Area soil types
3. Fire protection flows
4. Key customers
5. Coordination with City CSO and sewer replacement projects to minimize construction costs and community disruption
6. Geographical proximity of mains to be replaced/rehabilitated.

Working with the City jointly on projects reduces paving costs, traffic control costs, management and bond costs as well as mobilization and demobilization costs. If the City is not performing CSO or sewer rehabilitation work, the next least costly approach to water main replacement projects is to complete the rehab/replacement work in the same geographic area to help minimize community disruption and the cost of mobilizing and demobilizing equipment to different parts of the City. These primary drivers form the basis of project priorities as water main breaks are very limited on the unlined cast iron water main (less than 10 per year) and the soils in Nashua are non aggressive. The Company has identified "key" customers as hospitals, large manufacturers, and emergency facilities that are set up with multiple feeds, have adequate fire protection and due to an aggressive flushing program, are generally not bothered by colored water created by high flows in unlined cast iron water mains. There are sections of the water system where the unlined cast iron water main results in reduced fire flows and

those mains are considered a priority in the Company's WICA plan in the event the City is not performing CSO or sewer replacement work that would drive the replacement/rehabilitation of unlined cast iron.

**Q. If you are not experiencing breaks, colored water or other service issues with the unlined cast iron water main why are you recommending its replacement or rehabilitation?**

A. The tuberculation on the inside of unlined cast iron provides great protection for bacteria and results in bacterial regrowth that in turn can result in system outbreaks of bacteria. Additionally, the tuberculation is the result of oxidizing the cast iron with chlorine. The presence of unlined cast iron makes it difficult to maintain proper chlorine residuals in the distribution system. Lastly, this type of water main does yield colored water during certain flow conditions that is disruptive to businesses and residential customers. The industry universally recognizes the need to replace or rehabilitate unlined cast iron water mains.

**Q. What is the basis of deciding to rehabilitate a main versus replace a water main?**

A. The Company has developed a plan to replace/rehabilitate its unlined cast iron and steel water mains based on a review of the break history of the water main, an assessment of the existing water main's ability to deliver the fire protection flows stipulated by the Insurance Service Organization (ISO), and the types of soils in the area of the water main (to assess whether they are corrosive or not to the exterior of the cast iron water main). If the water main being evaluated for replacement versus rehabilitation has had a low break history and when cleaned

and lined can deliver the ISO required fire flows, and test pits and area soils maps show the surrounding soils are non corrosive to the existing water main, the Company will elect to clean and line the existing cast iron water main instead of replacing it. The cost of cleaning and lining an existing water main is about $80 less per lineal foot than replacing the existing water main.

**Q. Why would you rehabilitate a 100+ year old water main? Even though it is less expensive to rehabilitate the water main than to replace, won't a new line have a substantially longer service life than the rehabilitated water main and in the end isn't the extra cost of replacement justified?**

A. Older, pit cast water mains are less subject to exterior corrosion than ductile iron water main and have more than double the wall thickness of ductile iron water main. The cast iron water mains are expected to have service lives more than twice that of new ductile iron water mains. The industry expects that rehabbed 100+ year old cast iron water main will have a remaining service life that will match or exceed that of a newly installed ductile iron replacement water main.

**Q. Is the Company requesting that any other costs of infrastructure replacement besides water main replacement or rehabilitation be included in its WICA charges?**

A. Yes. The Company believes that the WICA charge should cover the replacement/rehabilitation of water main, water services, water gate valves, fire hydrants and water meters.

**Q. What are the rate increase parameters that the Company is requesting for its WICA plan?**

A. The Company is requesting a WICA adjustment of up to a maximum of 2% per year and no more than 7.5% total between rate cases.

**Q. How would the Company finance the WICA improvements?**

A. The Company will fund WICA projects with a mix of equity and debt. Initial debt would come from the Company's short term line of credit. Once a sufficient amount of short term debt had been accrued that it makes sense to refinance with long term debt, the Company will seek debt financing approval of the selected long term debt instrument from the Commission at that time.

**Q. When would the Company begin the main replacement/rehabilitation program?**

A. The Company proposes that the first year of its WICA program will be 2011.

**Q. Please explain why the Company believes that a conservation adjustment is not required as part of its WICA.**

A. Today's plumbing fixture standards, the cost of water, the cost of the energy associated with heating water and the cost of disposing of waste water have created an economic based drive to conservation at both the residential and commercial level. The average winter time consumption (February through April) for the Company's core residential customers has dropped from 6.59 CCF to 5.98 CCF per month, or a drop of 9.3%, between 2006 and 2009. Multifamily residential winter time consumption over the same time frame has dropped 37.35 CCF to 33.25 CCF per month or a drop of 11.0%. Commercial winter time consumption over the same time frame has dropped 40.42 CCF to 37.59 CCF per month or a drop of 7.0%. Industrial winter time consumption over the same time

frame, exclusive of Anheuser Busch, had dropped from 139.39 CCF to 91.92 CCF or a drop of 34.1% (this drop is due in part to more efficient operations but primarily due to a loss of industrial customers as manufacturing has moved out of the State and Country). This data points to a naturally occurring conservation effort driven by the factors detailed above and clearly points to the fact that a conservation adjustment is not necessary but would be counter productive in that it would further lower consumption resulting in the need for additional rate increases to recover the lost rates.

**Q. Does this complete your testimony?**

**A.** Yes.

**Pennichuck Water Works**
**WICA Calculation**
**4/12/2010**

**Schedule DW-1**

**Data:**

| | | | |
|---|---|---|---|
| Depreciation Rate on Water Mains - | | 1.25% | |
| 2010 Nashua Mil Rate - | $ | 17.40 | per $1,000 |
| 2010 State Wide Utility Tax Mil Rate - | $ | 6.60 | per $1,000 |
| Maximum Annual WICA adjustment - | | 2.00% | |
| 2010 ROI - | | 0.0781 | as filed with Case |
| 2010 Tax Rate (Federal and State) - | | 0.6039 | |
| Projected Revenues after "2010 step" - | $ | 28,802,091 | |
| Maximum Increase per year allowed by WICA - | $ | 576,042 | |
| Allowed WICA $$ per year - | $ | 3,756,973 | |

**Projected WICA Expenses (From Capex Budget)***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Annual Cleaning and Lining - | $ | 801,900 | | | | | |
| Annual Water Main Replacement - | $ | 1,826,550 | | | | | |
| Annual Meter Replacement - | $ | 19,635 | based on | 500 | rebuilds per year @ | $ 39.27 | per rebuild |
| Annual Service Replacement - | $ | 69,300 | based on | 35 | services per year | $ 1,980.00 | per replacement |
| **Total Estimated WICA projects per year -** | **$** | **2,717,385** | | | | | |
| **Projected Rate impact per year -** | **$** | **450,613** | | | | | |
| **Percent increase required -** | | **1.56%** | Based on projected 2010 Step rates | | | | |

| | | |
|---|---|---|
| *Based on replacing/rehabbing | 14,850 | of unlined CI or Steel watermain per year |
| Based on | 40% | of the water main being cleaned and lined. |
| Based on | 60% | of the water main being replaced. |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2010**

**Schedule DW-2**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| ARLINGTON | STREET | 1887 | CAST IRON | 6 | 1265 | | | City Paving | BURKE ST. TO MCKEAN ST. (Burke St to Underhill is a parallel main about 550') |
| ARLINGTON | STREET | 1887 | CAST IRON | 6 | 688 | | | City Sewer | |
| BATCHELDER | STREET | 1950 | CAST IRON | 1.25 | 114 | | | City Sewer | ARLINGTON ST EASTERLY |
| AMHERST | STREET | 1888 | CAST IRON | 8 | 699 | | | City Sewer | FAIRMOUNT ST. TO 27' N. OF MITCHELL ST. |
| BEECH | STREET | 1903 | CAST IRON | 6 | 45 | | | City Sewer | 338.3 N. OF MULBERRY ST. TO W. HOLLIS ST. |
| BEECH | STREET | 1928 | CAST IRON | 6 | 338 | | | City Sewer | MULBERRY ST. N. |
| BEECH | STREET | 1897 | CAST IRON | 6 | 465 | | | City Sewer | W. HOLLIS ST TO PLEASANT ST |
| PALM | STREET | 1897 | CAST IRON | 6 | 935 | | | City Parkway | W. HOLLIS ST. N'LY |
| PALM | STREET | 1905 | CAST IRON | 6 | 358 | | | City Parkway | KINSLEY ST. N'LY |
| PALM | STREET | 1887 | CAST IRON | 4 | 354 | | | City Parkway | 358' N. OF KINSLEY ST. N. LINE TO W. HOLLIS ST. 16" LINE |
| WILDER | STREET | 1887 | CAST IRON | 4 | 656 | | 1 | City Sewer | 69' S. OF W. HOLLIS ST. 12" LINE S'LY TO KINSLEY ST. |
| WILDER | STREET | 1909 | CAST IRON | 6 | 69 | | | City Sewer | W. HOLLIS ST. 12" LINE S'LY |
| HOLMAN | STREET | 1929 | Cement Lined | 2 | 253 | | | 2009 ARRA | CROSS ST WESTERLY TO GROVE ST. |
| GROVE | STREET | 1929 | Cement Lined | 1 | 253 | | | 2009 ARRA | HOLMAN ST NORTHERLY |
| JEFFERSON | STREET | 1888 | CAST IRON | 4 | 315 | | | 2009 ARRA | 6X4 REDUCER 14' W. OF TOLLES ST W'LY TO KENDIRCK ST. |
| JEFFERSON | STREET | 1888 | CAST IRON | 4 | 240 | | | 2009 ARRA | CROSS ST EASTERLY TO 4" LINE |
| JEFFERSON | STREET | 1892 | CAST IRON | 4 | 258 | | | 2009 ARRA | 6X4 REDUCER 17' W. OF CHANDLER ST W'LY TO LESSSARD ST |
| JEFFERSON | STREET | 1898 | CAST IRON | 6 | 143 | | | 2009 ARRA | 29' E. OF TOLLES ST EASTERLY TO LESSARD ST |
| GRANITE | STREET | 1888 | CAST IRON | 4 | 612 | | | City Paving | LOCK ST TO SUMMER ST (GOING WEST) (OPB 627) |
| NORTON | STREET | 1887 | CAST IRON | 4 | 345 | | | 2009 ARRA | SUMMER ST. N'LY TO #23 NORTON ST. |
| NORTON | STREET | 1896 | CAST IRON | 4 | 222 | | | 2009 ARRA | 323' N. OF LOCK ST. N'LY TO SUMMER ST. E'LY |
| NORTON | STREET | 1914 | CAST IRON | 6 | 323 | | | 2009 ARRA | LOCK ST. N'LY |
| CROSS | STREET | 1888 | CAST IRON | 6 | 593 | | | 2009 ARRA | HOLMAN ST. N'LY TO LOCK ST. |
| CROSS | STREET | 1891 | CAST IRON | 6 | 915 | | | 2009 ARRA | LOCK ST. TO SHATTUCK ST. |
| LOCK | STREET | 1887 | CAST IRON | 6 | 916 | | | 2009 ARRA | 46' E. OF CONCORD ST. 24" LINE E'LY TO DOW ST. |
| LOCK | STREET | 1887 | CAST IRON | 6 | 805 | | | 2009 ARRA | DOW ST. TO SALEM ST. N'LY |
| LOCK | STREET | 1887 | CAST IRON | 6 | 173 | | | 2009 ARRA | SALEM ST. E'LY TO COUPLING W. OF TOLLES ST. |
| LOCK | STREET | 1887 | CAST IRON | 6 | 467 | 84.4% | | 2009 ARRA | COUPLING E. OF TOLLES ST E'LY TO COUPLING W. OF CHANDLER ST. |
| LOCK | STREET | 1919 | CAST IRON | 6 | 226 | | | 2009 ARRA | ATHERTON AVE. E'LY |
| LESSARD | STREET | 1892 | CAST IRON | 4 | 187 | | | 2009 ARRA | JEFFERSON ST. S'LY |
| LESSARD | STREET | 1892 | CAST IRON | 4 | 287 | | | 2009 ARRA | LOCK ST. N'LY |
| SHATTUCK | STREET | 1888 | CAST IRON | 6 | 574 | | | 2009 ARRA | 20' E OF NORTON ST EASTERLY |
| SUMMER | STREET | 1896 | CAST IRON | 6 | 674 | | | 2009 ARRA | CROSS ST TO NORTON ST (GOING SOUTH) |
| SUMMER | STREET | 1906 | CAST IRON | 6 | 192 | | | 2009 ARRA | NORTON ST (GOING WEST) TO GRANITE ST |
| | | | | | **14959** | | | | |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**

**Schedule DW-2**

**Project Year - 2011**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| FAIRMOUNT | STREET | 1920 | CAST IRON | 8 | 1145 | | | City Parkway | CHARLES STREET WESTERLY |
| BALDWIN | STREET | 1938 | CAST IRON | 8 | 157 | | | City Parkway | PRESCOTT STREET WESTERLY |
| BALDWIN | STREET | 1938 | CAST IRON | 8 | 1076 | | | City Parkway | FAIRMOUNT STREET EASTERLY |
| HARBOR | AVENUE | 1888 | CAST IRON | 6 | 1025 | | | City Sewer | BOWERS ST TO E. HOLLIS ST. |
| HARBOR | AVENUE | 1888 | CAST IRON | 6 | 1765 | | 1 | City Sewer | BURKE ST TO OTTERSON ST |
| HARBOR | AVENUE | 1888 | CAST IRON | 6 | 245 | | | City Sewer | OTTERSON ST TO BOWERS ST |
| PROSPECT | STREET | 1888 | CAST IRON | 4 | 678 | | | City Sewer | 150' W. OF HARBOR AVE. W'LY TO 8X4 ENLARGER 35' E. OF DEARBORN |
| TYLER | STREET | 1888 | CAST IRON | 4 | 430 | | | City Sewer | 128.5' E OF DEARBORN ST, E TO 396.5' W OF HARBOR AV. |
| TYLER | STREET | 1889 | CAST IRON | 4 | 89 | | | City Sewer | 39.1 E OF DEARBORN ST EASTERLY 89.4 |
| TYLER | STREET | 1905 | CAST IRON | 6 | 396 | | | City Sewer | HARBOR AV WESTERLY 396.5' |
| TYLER | STREET | 1931 | CAST IRON | 8 | 38 | | | City Sewer | DEARBORN ST EASTERLY |
| OTTERSON | STREET | 1887 | CAST IRON | 6 | 948 | | | City Sewer | MAIN ST. E'LY TO POND ST. |
| OTTERSON | STREET | 1892 | CAST IRON | 6 | 350 | | | City Sewer | HARBOR AVE. TO POND ST. |
| POND | STREET | 1887 | CAST IRON | 6 | 130 | | 1 | | OTTERSON ST. S'LY |
| POND | STREET | 1904 | CAST IRON | 6 | 322 | | | | HARBOR AVE. W'LY |
| POND | STREET | 1910 | CAST IRON | 6 | 142 | | | | 322.75' W. OF HARBOR AVE. W'LY 48' THEN EASTERLY 94.5' |
| POND | STREET | 1933 | CAST IRON | 8 | 626 | | | | BOWERY ST. S'LY |
| HARBOR | COURT | 1959 | GALVINIZED | 2 | 176 | | | City Sewer | HARBOR AVE E'LY |
| HARBOR | COURT | 1960 | GALVINIZED | 2 | 34 | | | City Sewer | EXT. E'LY |
| LYONS | STREET | 1941 | CAST IRON | 8 | 179 | | | City Sewer | MARSHALL ST. W'LY |
| BOWERY | STREET | 1887 | CAST IRON | 6 | 325 | | | City Sewer | POND ST. TO HARBOR AVE. |
| MARSHALL | STREET | 1896 | CAST IRON | 8 | 1080 | | 1 | | E. HOLLIS ST. TO BOWERS ST. |
| NEW | STREET | 1921 | CAST IRON | 6 | 15 | | | City Sewer | BOWERS ST. W'LY |
| NEW | STREET | 1922 | CAST IRON | 6 | 273 | | | City Sewer | 15' N. OF BOWERS ST. N'LY |
| NEW | STREET | 1929 | Cement Lined | 2 | 203 | | | City Sewer | 288' N. OF BOWERS ST. N'LY |
| CROWLEY | STREET | 1920 | CAST IRON | 4 | 103 | | | City Sewer | HARBOR AVE. E'LY |
| KEHOE | AVENUE | 1946 | Cement Lined | 2 | 181 | | | City Sewer | HARBOR AVE E'LY 181' |
| KEHOE | AVENUE | 1947 | Cement Lined | 1.25 | 72 | | | City Sewer | EXT E'LY FROM #5 TO #9-21 |
| HAMMOND | STREET | 1946 | Cement Lined | 2 | 85 | | | City Sewer | TYLER ST SOUTHERLY |
| MARSHALL | STREET | 1925 | CAST IRON | 8 | 100 | | | City Sewer | BOWERS ST. S'LY |
| DEARBORN | STREET | 1915 | CAST IRON | 8 | 272 | | | City Sewer | BOWERS ST TO PROSPECT ST. |
| DEARBORN | STREET | 1929 | CAST IRON | 8 | 249 | | | City Sewer | BOWERS ST TO OTTERSON ST |
| PROSPECT | STREET | 1904 | CAST IRON | 6 | 43 | | | City Sewer | MAIN ST. E'LY |
| PROSPECT | AVENUE | 1909 | CAST IRON | 4 | 265 | | | City Sewer | MAIN ST. 24" LINE W'LY |
| ALLDS | STREET | 1888 | CAST IRON | 6 | 296 | | 1 | City Sewer | 20' S. OF THE SL OF NYE AV. S'LY 296' |
| ALLDS | STREET | 1924 | CAST IRON | 8 | 117 | | | City Sewer | MCKEAN ST. S'LY |
| ALLDS | STREET | 1930 | CAST IRON | 8 | 967 | | | City Sewer | HAINES ST. S'LY 967' TO HARBOR AVE. |
| | | | | | **14597** | | | | |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2012**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| SPRUCE | STREET | 1931 | CAST IRON | 10 | 1092 | | 1 | | E. HOLLIS ST TO TEMPLE ST 1092.9 |
| SCRIPTURE | STREET | 1924 | CAST IRON | 8 | 458 | | | | TEMPLE ST TO WORCESTER ST. |
| WORCESTER | STREET | 1888 | CAST IRON | 6 | 220 | | | | SCRIPURE ST TO HOWARD ST 220' |
| WORCESTER | STREET | 1924 | CAST IRON | 8 | 167 | | | | SCRIPTURE ST WESTERLY 167' |
| WORCESTER | STREET | 1931 | CAST IRON | 8 | 187 | | | | SPRUCE ST TO 187.5' E OF SPRUCE ST. |
| HOWARD | STREET | 1888 | CAST IRON | 4 | 100 | | | | WORCESTER ST SOUTHERLY |
| HOWARD | STREET | 1889 | CAST IRON | 4 | 243 | | | | HOYTS LAND TO WORCESTER ST |
| HOWARD | STREET | 1926 | GALVINIZED | | 98 | | 2 | | HOWARD ST EASTERLY 98' |
| HOWARD | STREET | 1928 | GALVINIZED | 2 | 92 | | | | 100' S OF WORCESTER ST SOUTHERLY |
| HOYTS | LANE | 1922 | CAST IRON | 4 | 71 | | | | SCRIPTURE ST EASTRLY |
| TEMPLE | STREET | 1888 | CAST IRON | 8 | 1256 | | | | AMORY ST TO INTERSECTION AT SOUTH ST. |
| TEMPLE | STREET | 1908 | CAST IRON | 10 | 974 | 82.9% | | | E. HOLLIS ST TO AMORY ST |
| UNION | STREET | 1909 | CAST IRON | 4 | 173 | | | | AMORY ST E'LY 173.5' |
| AMORY | STREET | 1887 | CAST IRON | 8 | 595 | 82.9% | | | BRIDGE ST. TO TEMPLE ST. |
| WARREN | STREET | 1890 | CAST IRON | 4 | 262 | | | | 72' N OF BRIDGE ST NORTHERLY |
| WARREN | STREET | 1890 | CAST IRON | 6 | 72 | | | | BRIDGE ST NORTHERLY 72' |
| ROBINSON | COURT | 1888 | CAST IRON | 4 | 250 | | | | BRIDGE ST NORTHERLY 250' |
| JACKSON | STREET | 1928 | CAST IRON | 2 | 265 | | | | BRIDGE ST NORTHERLY 265' |
| C | STREET | 1931 | CAST IRON | 10 | 627 | | | | E. HOLLIS ST. TO BRIDGE ST. |
| D | STREET | 1898 | CAST IRON | 4 | 452 | | | | BRIDGE ST TO E. HOLLIS ST. |
| D | STREET | 1909 | CAST IRON | 6 | 47 | | | | E. HOLLIS ST. NORTHERLY |
| E | STREET | 1906 | CAST IRON | 8 | 380 | | | | BRIDGE ST TO E. HOLLIS ST |
| E. HOLLIS | STREET | 1888 | CAST IRON | 8 | 480 | | 1 | | 1' W. OF MASON ST. W'LY TO 4' E. OF QUINCY ST. |
| E. HOLLIS | STREET | 1888 | CAST IRON | 8 | 411 | | | | 4' W. OF QUINCY ST W'LY TO 8' E. OF SPRING ST. |
| E. HOLLIS | STREET | 1888 | CAST IRON | 8 | 410 | | | | 4' W. OF SPRING ST. W'LY TO MAIN ST. |
| E. HOLLIS | STREET | 1896 | CAST IRON | 8 | 680 | | 1 | | MARSHALL ST WESTERLY 680' |
| E. HOLLIS | STREET | 1922 | CAST IRON | 6 | 124 | | | | BRIDGE ST. WESTERLY |
| CROWN | STREET | 1933 | CAST IRON | 8 | 11 | | | | ALLDS ST. E'LY |
| CROWN | STREET | 1902 | CAST IRON | 6 | 297 | | | | HOBBS AVE. E'LY |
| CROWN | STREET | 1901 | CAST IRON | 6 | 223 | | | | ARLINGTON ST. TO W. OF DENTON ST. |
| CROWN | STREET | 1936 | CAST IRON | 6 | 66 | | | | E. OF COLBURN ST. E'LY |
| CHASE | STREET | 1902 | CAST IRON | 6 | 430 | | 1 | | E. HOLLIS ST. TO CROWN St. |
| HAVELIN | AVENUE | 1947 | Cement Lined | | 116 | | | | UNION ST S'LY |
| HOBBS | AVENUE | 1906 | CAST IRON | 8 | 493 | | | | E. HOLLIS ST TO CROWN ST |
| COMMERCIAL | STREET | 1887 | CAST IRON | 8 | 290 | | | | TEMPLE ST. S'LY |
| COMMERCIAL | STREET | 1929 | CAST IRON | 8 | 15 | | | | 290.5' S. OF TEMPLE ST. S'LY |
| SANDERS | STREET | 1889 | CAST IRON | 6 | 633 | 42.9% | 1 | | BRIDGE ST NORTHERLY (Could be abandon) |
| BANCROFT | STREET | 1898 | CAST IRON | 6 | 715 | | 1 | | BRIDGE ST. N'LY |
| | | | | | 13475 | | | | |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2013**

**Schedule DW-2**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| ARLINGTON | AVENUE | 1935 | CAST IRON | 2 | 2 | | | | EXT. E'LY |
| ARLINGTON | AVENUE | 1926 | GALVINIZED | 2 | 62 | | | | END OF 4" N'LY 21' THEN E'LY 41' |
| ARLINGTON | STREET | 1887 | CAST IRON | 6 | 1403 | | | | E. HOLLIS ST. S. TO BOWERS ST |
| ARLINGTON | AVENUE | 1922 | CAST IRON | 4 | 200 | | | | GILLIS ST, N'LY |
| CROWN | STREET | 1887 | CAST IRON | 4 | 595 | | | | ALLDS ST. TO ARLINGTON |
| MCKEAN | STREET | 1888 | CAST IRON | 6 | 1714 | | | | ALLDS ST. TO ARLINGTON ST. |
| NEWBURY | STREET | 1888 | CAST IRON | 6 | 603 | | | | MCKEAN ST. TO 174' S. OF HAINES ST. |
| NEWBURY | STREET | 1892 | CAST IRON | 6 | 371 | | | | 84' S. OF KING ST. S'LY |
| NEWBURY | STREET | 1892 | CAST IRON | 6 | 107 | | | | END OF PIPE AT 175' S. OF UNDERHILL RD S'LY TO BURKE ST. |
| NEWBURY | STREET | 1919 | CAST IRON | 8 | 117 | | 1 | | BURKE ST. S'LY |
| NEWBURY | STREET | 1939 | CAST IRON | 8 | 290 | | | | MCKEAN ST. N'LY |
| NEWBURY | STREET | 1940 | CAST IRON | 8 | 370 | | | | 290' N. OF MCKEAN ST. N'LY TO BOWERS ST. |
| BARKER | AVENUE | 1892 | CAST IRON | 6 | 554 | | | | BURKE ST. TO KING ST. |
| UNDERHILL | STREET | 1894 | CAST IRON | 4 | 134 | | | | NEWBURY ST WESTERLY |
| UNDERHILL | STREET | 1921 | CAST IRON | 6 | 98 | | | | 225' W OF NEWBURY ST WESTERLY 98' |
| UNDERHILL | STREET | 1936 | CAST IRON | 8 | 194 | | | | ARLINGTON ST W'LY |
| THOMAS | STREET | 1908 | CAST IRON | 6 | 223 | | | | MCKEAN ST SOUTHERLY 223.3' |
| THOMAS | STREET | 1926 | CAST IRON | 6 | 226 | | | | HAINES ST NORTHERLY TO 6" |
| WILLIAMS | STREET | 1910 | CAST IRON | 6 | 228 | | | | FROM ALLDS ST. E'LY |
| WILLIAMS | STREET | 1923 | CAST IRON | 6 | 96 | | | | 228' E. OF ALLDS ST. E'LY |
| WILLIAMS | STREET | 1928 | CAST IRON | 6 | 470 | | | | 324' E. OF ALLDS ST. E'LY |
| WILLIAMS | STREET | 1934 | CAST IRON | 6 | 6 | | | | 390'7" W. OF ARLINGTON ST. |
| WILLIAMS | STREET | 1934 | CAST IRON | 8 | 695 | | | | ARLINGTON ST. W'LY TO 6" |
| CHERRY | STREET | 1926 | CAST IRON | 4 | 236 | | | | MCKEAN ST. S'LY |
| COPP | STREET | 1907 | CAST IRON | 6 | 16 | | | | BOWERS ST. N'LY |
| COPP | STREET | 1927 | CAST IRON | 6 | 343 | | | | 16.2' N. OF BOWERS ST. TO GILLIS ST. |
| GILLIS | STREET | 1888 | CAST IRON | 4 | 1090 | | 1 | | ARLINGTON ST TO ALLDS ST |
| GILLIS | STREET | 1888 | CAST IRON | 4 | 315 | | | | ARLINGTON ST EASTERLY |
| GILLIS | STREET | 1940 | CAST IRON | 4 | 10 | | | | CONNECTION BETWEEN 4" AND 8" MAINS EAST OF ARLINGTON ST. |
| GILLIS | STREET | 1940 | CAST IRON | 8 | 450 | | | | ARLINGTON ST E'LY |
| MILL | STREET | 1941 | Cement Lined | | 221 | | | | GILLIS ST. N'LY |
| GRAYS | AVENUE | 1907 | CAST IRON | 6 | 358 | | | | BOWERS ST TO GILLIS ST |
| HARVARD | STREET | 1915 | CAST IRON | 8 | 808 | | | | ALLDS ST TO ARLINGTON ST |
| MULVANITY | STREET | 1941 | CAST IRON | 2 | 11 | | | | NONE MENTIONED |
| MULVANITY | STREET | 1940 | Cement Lined | 2 | 218 | | | | PROCTOR ST. N'LY |
| MULVANITY | STREET | 1954 | Cement Lined | 2 | 56 | | | | EXT. N'LY |
| PROCTOR | AVENUE | 1922 | CAST IRON | 1 | 179 | | | | HARBOR AVE. E'LY |
| PROCTOR | STREET | 1930 | CAST IRON | 8 | 111 | | | | ALLDS ST. W'LY |
| PROCTOR | STREET | 1940 | CAST IRON | 2 | 55 | | 1 | | 172' W. OF W. LINE OF ALLDS ST. W'LY |
| PROCTOR | STREET | 1940 | CAST IRON | 8 | 95 | | | | 77' W. OF W. LINE OF ALLDS ST. W'LY |
| PROCTOR | STREET | 1940 | CAST IRON | | 81 | | | | 172' W. OF W. LINE OF ALLDS ST. W'LY |
| | | | | | **13411** | | | | |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2014**

**Schedule DW-2**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| HAINES | STREET | 1934 | GALVINIZED | | 70 | | | | ALPINE AVE. W'LY |
| KING | STREET | 1923 | CAST IRON | 6 | 473 | | | | ARLINGTON ST EASTERLY 473.5 |
| NOTRE DAME | STREET | 1960 | Cement Lined | | 50 | | | | EXT. N'LY |
| NOTRE DAME | STREET | 1926 | GALVINIZED | 2 | 149 | | | | KING ST. S'LY |
| NOTRE DAME | STREET | 1927 | GALVINIZED | 2 | 51 | | | | 150' S. OF KING ST. S'LY |
| MCKEAN | STREET | 1888 | CAST IRON | 6 | 1714 | | | | ALLDS ST. TO ARLINGTON ST. |
| INGALLS | STREET | 1949 | Cement Lined | | 139 | | | | END OF 8" S'LY - TO #23 |
| INGALLS | STREET | 1921 | GALVINIZED | | 196 | | | | BURKE ST S'LY |
| INGALLS | STREET | 1965 | GALVINIZED | 2 | 9 | | | | AT BURKE ST. 1 1/4" M-S FROM 6" ABANDONED - NEW 2"C.L. |
| BENSON | AVENUE | 1889 | CAST IRON | 4 | 315 | | | | BURKE ST. S'LY |
| BENSON | AVENUE | 1890 | CAST IRON | 4 | 315 | | | | 315' S. OF BURKE ST. S'LY TO SPAULDING ST. |
| SPALDING | STREET | 1890 | CAST IRON | 6 | 363 | | | | BENSON AV EASTERLY 363' |
| SPALDING | STREET | 1891 | CAST IRON | 6 | 233 | | | | 363' W OF BENSON AV WESTERLY 233' |
| SPALDING | STREET | 1911 | CAST IRON | 6 | 106 | | | | 596' W OF BENSON AV TO ALLDS RD. |
| SPALDING | AVENUE | 1924 | CAST IRON | 6 | 269 | | | | SPALDING ST. S'LY 269' |
| SPALDING | AVENUE | 1940 | CAST IRON | 2 | 96 | | | | 242' SOUTH OF S. LINE OF SPALDING ST S'LY |
| SPALDING | AVENUE | 1940 | CAST IRON | | 70 | | | | 242' SOUTH OF S. LINE OF SPALSING ST S'LY |
| ALSTEAD | AVENUE | 1911 | CAST IRON | 4 | 126 | | | | SPAULDING ST. N'LY |
| ALSTEAD | AVENUE | 1920 | CAST IRON | 4 | 46 | | | | ALLSTEAD AVE. (GOING NORTH) E'LY |
| ALSTEAD | AVENUE | 1922 | CAST IRON | 4 | 70 | | | | E. END OF PIPE EASTERLY |
| BUCHANAN | STREET | 1912 | CAST IRON | 6 | 173 | | | | NUTT ST. W'LY |
| BUCHANAN | STREET | 1916 | CAST IRON | 6 | 237 | | | | 1735' W. OF NUTT ST. W'LY |
| BUCHANAN | STREET | 1934 | CAST IRON | 8 | 176 | | | | MAIN ST. E'LY |
| FAXON | STREET | 1906 | CAST IRON | 6 | 184 | | | | MAIN ST 10" LINE EASTERLY 184' |
| FAXON | STREET | 1908 | CAST IRON | 6 | 38 | | | | NUTT ST WESTERLY 38' |
| FAXON | STREET | 1908 | CAST IRON | 6 | 107 | | | | 184' E OF MAIN ST 10" LINE, EASTERLY 107' |
| FAXON | STREET | 1911 | CAST IRON | 6 | 261 | | | | 291' E OF MAIN ST 10" LINE TO, 38' WEST OF NUTT ST |
| FAXON | AVENUE | 1940 | Cement Lined | 2 | 195 | | 1 | | FAXON AVE N'LY 209' |
| FAXON | AVENUE | 1940 | Cement Lined | | 14 | | | | FAXON AVE N'LY 209' |
| NUTT | STREET | 1890 | CAST IRON | 4 | 420 | | | | LINCOLN AVE. N'LY |
| NUTT | STREET | 1945 | Cement Lined | | 53 | | | | FAXON ST. N'LY |
| LINCOLN | AVENUE | 1889 | CAST IRON | 6 | 641 | | | | MAIN ST. E'LY |
| LINCOLN | AVENUE | 1915 | CAST IRON | 6 | 192 | | | | 192' W. OF FIFIELD ST. |
| TAYLOR | STREET | 1892 | CAST IRON | 6 | 387 | | | | FIFIELD ST GOING SOUTH, EASTERLY 387' |
| TAYLOR | STREET | 1906 | CAST IRON | 6 | 24 | | | | 16" LINE IN MAIN ST, TO 12' E OF EASTLINE OF MAIN ST |
| TAYLOR | STREET | 1910 | CAST IRON | 6 | 398 | | | | 12' E OF MAIN ST EASTERLY 398' |
| TAYLOR | STREET | 1919 | CAST IRON | 6 | 132 | | | | FIFIELD ST GOING SOUTH WESTERLY 132' |
| TAYLOR | STREET | 1922 | CAST IRON | 6 | 250 | | | | 108' W OF FIFIELD ST WESTERLY TO 6' ABT 250 |
| TAYLOR | STREET | 1927 | CAST IRON | 8 | 304 | | | | 387' E OF FIFIELD ST GOING SOUTH EASTERLY |
| TAYLOR | STREET | 1940 | CAST IRON | 6 | 14 | | | | HYDRANT NEAR LYNN ST. |
| TAYLOR | STREET | 1940 | CAST IRON | 8 | 218 | | | | FROM 4" SERVICE AT HAUG'S LABORATORY E'LY 218' |
| TAYLOR | STREET | 1940 | CAST IRON | 8 | 206 | | | | FROM 8" x 4" TEE AT MORSE E'LY 206' |
| RUSSELL | AVENUE | 1906 | CAST IRON | 6 | 38 | | | | 16" LINE IN MAIN ST EASTERLY 38' |
| RUSSELL | AVENUE | 1913 | CAST IRON | 6 | 186 | | | | FIFIELD ST EASTERLY |
| RUSSELL | AVENUE | 1937 | CAST IRON | 8 | 724 | | | | BETWEEN HYDRANTS |
| MONTGOMERY | AVENUE | 1914 | CAST IRON | 8 | 252 | | | | MAIN ST. E'LY |
| MONTGOMERY | AVENUE | 1925 | CAST IRON | 8 | 96 | | | | 252' E. OF MAIN ST. E'LY |
| MONTGOMERY | AVENUE | 1930 | CAST IRON | 8 | 111 | | | | 348' E. OF MAIN ST. E'LY |
| MONTGOMERY | AVENUE | 1930 | CAST IRON | 8 | 46 | | | | FIFIELD ST. W'LY |
| DICKERMAN | STREET | 1923 | CAST IRON | 6 | 183 | | | | MAIN ST EASTERLY |
| DICKERMAN | STREET | 1926 | CAST IRON | 6 | 197 | | | | 183' E OF MAIN ST EASTERLY |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2014 (Continued)**

**Schedule DW-2**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| DICKERMAN | STREET | 1939 | CAST IRON | 8 | 417 | | | | FROM 4" SERVICE TO LAUNDRY - E'LY |
| ORCHARD | AVENUE | 1916 | CAST IRON | 10 | 703 | | | | 118' E. OF MAIN ST. E'LY |
| ORCHARD | AVENUE | 1917 | CAST IRON | 10 | 128 | | | | MAIN ST. E'LY |
| ORCHARD | AVENUE | 1925 | CAST IRON | 10 | 72 | | | | 821' E. OF MAIN ST. E'LY |
| ORCHARD | AVENUE | 1932 | CAST IRON | 10 | 100 | | | | FIFIELD DR. E. LINE W'LY |
| MOUNTAIN VIEW | AVENUE | 1917 | CAST IRON | 6 | 73 | | | | TAFT ST. N'LY |
| MOUNTAIN VIEW | AVENUE | 1940 | CAST IRON | 6 | 197 | | | | ORCHARD AVE. S'LY |
| TAFT | STREET | 1917 | CAST IRON | 6 | 289 | | | | CLEMENT ST WESTERLY 289' |
| TAFT | STREET | 1917 | CAST IRON | 6 | 161 | | | | CLEMENT ST TO MOUNTAIN VIEW AV |
| TAFT | STREET | 1936 | CAST IRON | 6 | 129 | | | | EXT S'LY TWD. MORNINGSIDE DR. |
| TAFT | STREET | 1939 | CAST IRON | 6 | 86 | | | | EXT. S'LY THROUGH THE INTERSECTION OF MORNINGSIDE DR |
| CLEMENT | STREET | 1917 | CAST IRON | 6 | 461 | | | | ORCHARD AVE. TO TAFT ST. |
| CIRCLE | AVENUE | 1930 | Cement Lined | 2 | 164 | | | | NUTT ST. E'LY |
| | | | | | **14297** | | | | |

Schedule DW-2

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2015**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| LAWNDALE | AVENUE | 1927 | CAST IRON | 6 | 160 | | | | FOWELL AVE. N'LY |
| LAWNDALE | AVENUE | 1927 | CAST IRON | 6 | 400 | | | | FOWELL AVE. TO STEVENS ST. |
| LAWNDALE | AVENUE | 1931 | CAST IRON | 8 | 348 | | | | STEVENS ST. SOUTH |
| LAWNDALE | AVENUE | 1937 | CAST IRON | 6 | 96 | | | | 160' N. OF TOWELL AVE. N'LY |
| LAWNDALE | AVENUE | 1940 | CAST IRON | 6 | 8 | | | | 380' S. OF STEVENS ST. |
| EVERGREEN | STREET | 1940 | Cement Lined | | 125 | | | | 155' SOUTH OF STEVENS TO S'LY 125 |
| EVERGREEN | STREET | 1947 | Cement Lined | | 154 | | | | STEVENS ST S'LY |
| EVERGREEN | STREET | 1949 | Cement Lined | | 31 | | | | 251' SOUTH OF S. LINE OF STEVENS ST S'LY |
| EVERGREEN | STREET | 1952 | Cement Lined | 1 | 5 | | | | AT END OF C.L. MAIN |
| FERNWOOD | STREET | 1924 | CAST IRON | 6 | 123 | | | | FIELD ST SOUTHERLY |
| FERNWOOD | STREET | 1945 | Cement Lined | 6 | 184 | | | | 95' S OF S. LINE OF FIELD ST - S'LY |
| FERNWOOD | STREET | 1924 | GALVINIZED | 2 | 238 | | | | FERNWOOD ST TO FIELDS GROVE |
| FERNWOOD | STREET | 1924 | GALVINIZED | 6 ? | 144 | | | | FERNWOOD ST TO FIELDS GROVE |
| FERNWOOD | STREET | 1924 | GALVINIZED | 2 | 135 | | | | FERNWOOD ST TO FIELDS GROVE |
| FIELD | STREET | 1922 | CAST IRON | 6 | 306 | | | | MAIN ST WESTERLY 306' |
| FIELD | STREET | 1924 | CAST IRON | 6 | 71 | | | | AT FERNWOOD |
| FOSSA | AVENUE | 1928 | CAST IRON | 4 | 12 | | | | MAIN ST WESTERLY |
| FOSSA | AVENUE | 1928 | CAST IRON | 6 | 282 | | | | MAIN ST WESTERLY |
| MORTON | STREET | 1945 | Cement Lined | | 176 | | | | STEVENS ST. S'LY |
| MORTON | STREET | 1947 | Cement Lined | | 115 | | | | 150' SOUTH OF SOUTH LINE OF STEVENS ST. S'LY |
| MORTON | STREET | 1956 | Cement Lined | | 165 | | | | STEVENS ST. N'LY |
| PRATT | STREET | 1908 | CAST IRON | 6 | 305 | | | | NONE MENTIONED |
| PRATT | STREET | 1933 | CAST IRON | 6 | 108 | | | | ZELLWOOD AVE. E'LY |
| PRATT | STREET | 1945 | CAST IRON | 6 | 71 | | | | S. CHESTNUT ST. E'LY |
| PARK | AVENUE | 1927 | CAST IRON | 8 | 121 | | | | SO. CHESTNUT ST. E'LY |
| PARK | AVENUE | 1946 | Cement Lined | 2 | 13 | | | | EXT. W'LY TO #38 |
| PARK | AVENUE | 1927 | GALVINIZED | 2 | 141 | | | | SO. CHESTNUT ST. W'LY |
| STEVENS | STREET | 1896 | CAST IRON | 4 | 384 | | | | 24' W OF MAIN ST WESTERLY |
| STEVENS | STREET | 1927 | CAST IRON | 6 | 94 | | | | SO CHESTNUT ST EASTERLY TO 6" LINE 94.4' |
| STEVENS | STREET | 1928 | CAST IRON | 6 | 48 | | | | 658' W OF MAIN ST WESTERLY 48.83' |
| STEVENS | STREET | 1930 | CAST IRON | 6 | 24 | | | | MAIN ST WEST |
| STEVENS | STREET | 1930 | CAST IRON | 6 | 250 | | | | 408' W OF MAIN ST WESTERLY |
| ZELLWOOD | STREET | 1933 | CAST IRON | 6 | 367 | | | | PRATT ST. TO FOWELL AVE. |
| W. ALLDS | STREET | 1930 | CAST IRON | 2 | 43 | | | | MAIN ST 24" LINE |
| W. ALLDS | STREET | 1931 | CAST IRON | 2 | 234 | | | | MAIN ST WESTERLY |
| FOWELL | AVENUE | 1919 | CAST IRON | 6 | 540 | | | | MAIN ST WESTERLY |
| FOWELL | AVENUE | 1923 | CAST IRON | 6 | 252 | | | | 505.5' W OF MAIN ST WESTERLY |
| FOWELL | AVENUE | 1924 | CAST IRON | 6 | 105 | | | | 757' WEST OF MAIN ST WESTERLY |
| FOWELL | AVENUE | 1938 | Cement Lined | 1.5 | 37 | | 1 | | W'LY END OF FOWELL AVE. |
| REVERE | STREET | 1921 | CAST IRON | 6 | 144 | | | | FROM 6" PIPE ON MAIN ST WESTERLY |
| REVERE | STREET | 1923 | CAST IRON | 6 | 401 | | | | FROM EXISING 144' OF PIPE WESTERLY |
| REVERE | STREET | 1923 | CAST IRON | 6 | 84 | | | | 545' WEST OF MAIN STREET WESTERLY. |
| REVERE | STREET | 1939 | CAST IRON | 6 | 85 | | | | 85' EAST OF LAUNDALE AVE E'LY TO EXISITING 6" MAIN |
| REVERE | STREET | 1945 | CAST IRON | 6 | 85 | | | | LAUNDALE AVE - E'LY |
| RICE | STREET | 1925 | CAST IRON | 6 | 208 | | | | BURNETT ST WESTERLY |
| BURNETT | STREET | 1925 | CAST IRON | 6 | 482 | | | | 45' N. OF E. DUNSTABLE RD. TO RICE ST. |
| OAKLAND | AVENUE | 1929 | Cement Lined | 2 | 210 | | 1 | | BURNETT ST. W'LY |
| OAKLAND | AVENUE | 1930 | Cement Lined | 2 | 63 | | | | ROBY ST. E'LY |
| BIRCH BROW | ROAD | 1939 | CAST IRON | 2 | 35 | | | | S'LY 35' TO EDWARDS AVE. |
| BIRCH BROW | ROAD | 1943 | Cement Lined | | 50 | | | | EDWARDS AVE. S'LY |
| BIRCH BROW | ROAD | 1970 | Cement Lined | 2 | 58 | | | | ROBINSON RD. S'LY |

**Pennichuck Water Works**
**Water Infrastructure and Conservation Adjustment Target List**
**Unlined Cast Iron and Steel Water Main By Area**
**Project Year - 2015 (Continued)**

| Street Name | Street Type | Install date | Material | Size | Length | % of ISO Flow | Number of Breaks | Critical Customers | Limits |
|---|---|---|---|---|---|---|---|---|---|
| EASTMAN | STREET | 1926 | CAST IRON | 8 | 757 | | | | 35' S. OF LEARNED ST TO ROBINSON RD. |
| DANE | STREET | 1930 | CAST IRON | 6 | 37 | | | | 35' S. OF LEARNED ST SE'LY |
| DANE | STREET | 1932 | CAST IRON | 8 | 191 | | | | ROBINSON RD. TO HATCH ST. |
| HATCH | STREET | 1925 | CAST IRON | 8 | 48 | | | | LEARNED ST NORTHERLY |
| HATCH | STREET | 1925 | CAST IRON | 8 | 228 | | | | LEARNED ST SOUTH |
| HATCH | STREET | 1931 | CAST IRON | 8 | 306 | | | | 48' N OF LEARNED ST NORTHERLY 306' |
| HATCH | STREET | 1932 | CAST IRON | 8 | 177 | | | | 21' SE OF EAST DUNSTABLE RD SE 177' |
| HATCH | STREET | 1932 | CAST IRON | 8 | 215 | | | | DANE ST TO HATCH ST (GOING S) |
| HATCH | STREET | 1925 | GALVINIZED | 2 | 253 | | | | LEARNED ST SOUTH |
| HARRIS | STREET | 1947 | Cement Lined | 6 | 260 | | | | LEARNED ST S'LY |
| EDWARDS | AVENUE | 1939 | Cement Lined | 1.25 | 278 | | | | BIRCH BROW - W'LY 278' |
| LYNN | STREET | 1939 | CAST IRON | 8 | 337 | | | | 466.8' E. OF TAYLOR RD. E'LY |
| LYNN | STREET | 1940 | CAST IRON | 8 | 682 | | | | WAVERLEY ST. W'LY |
| LYNN | STREET | 1941 | CAST IRON | 6 | 4 | | | | 730' E. OF TAYLOR RD. |
| LYNN | STREET | 1941 | CAST IRON | 8 | 482 | | | | TAYLOR RD. E'LY |
| WAVERLEY | STREET | 1940 | CAST IRON | 8 | 246 | | | | LYNN ST S'LY 246.6' |
| WAVERLEY | STREET | 1941 | CAST IRON | 6 | 4 | | | | 32' SOUTH OF LYNN ST. |
| VIRGINIA | DRIVE | 1929 | CAST IRON | 8 | 180 | | | | 121.5' E. OF SO. CHESTNUT ST. E'LY |
| | | | | | 13005 | | | | |
| | | | **Total** | | **83744** | | | | |