

**STATE OF NEW HAMPSHIRE  
BEFORE THE  
PUBLIC UTILITIES COMMISSION**

**Re: Pennichuck East Utility, Inc. – Maple Hills/SRF Financing**

**DW 08-**

**DIRECT PREFILED TESTIMONY OF DONALD L. WARE**

February 15, 2008

1 **Professional and Educational Background**

2 Q. What is your name and what is your position with Pennichuck East Utility,  
3 Inc.?

4 A. My name is Donald L. Ware. I am the President of Pennichuck East  
5 Utility, Inc. (the "Company"). I have worked for the Company since  
6 Pennichuck Corporation ("Pennichuck") formed the Company in 1998 to  
7 acquire a number of community water systems. I am a licensed  
8 professional engineer in New Hampshire, Massachusetts and Maine.

9 Q. Please describe your educational background.

10 A. I have a Bachelor in Science degree in Civil Engineering from Bucknell  
11 University in Lewisburg, Pennsylvania and I completed all the required  
12 courses, with the exception of my thesis, for a Masters degree in Civil  
13 Engineering from the same institution. I have a Masters in Business  
14 Administration from the Whittemore Business School at the University of  
15 New Hampshire.

16 Q. Please describe your professional background.

17 A. Prior to joining Pennichuck Corporation, I served as the General Manager  
18 of the Augusta Water District in Augusta, Maine from 1986 to 1995. I  
19 served as the District's engineer between 1982 and 1986. Prior to my  
20 engagement with the District, I served as a design engineer for the State  
21 of Maine Department of Transportation for six months and before that as a  
22 design engineer for Buchar-Horn Consulting Engineers from 1979 to  
23 1982.

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

2 A. As President, I am responsible for the overall operations of the Company,  
3 including water quality and supply, distribution, engineering and water  
4 system capital improvements. With regard to capital improvements  
5 overseen by the Company's Engineering Department, I work closely with  
6 the Department and the Company's Chief Engineer regarding project  
7 selection, project design, project management and construction  
8 management.

9 Q. What is the purpose of your testimony?

10 A. I will be describing the state of the Maple Hills community water system  
11 ("MHCWS") and the options available for making upgrades to that system.

12 Q. Please describe the current status of the MHCWS.

13 A. The MHCWS is located in Derry and was constructed by a developer in  
14 1969 and then acquired by Southern New Hampshire Water Company. In  
15 1998, the system was acquired by the Company. The MHCWS currently  
16 serves 182 single-family residential customers . On an average year-  
17 round basis, each home uses approximately 201 gallons per day. All  
18 water flowing to these 182 homes is provided by two wells, with a  
19 combined sixty-four gallon-per-minute capacity. The water pumped from  
20 these wells is treated for iron, manganese, sulfides and radon and then is  
21 discharged into four atmospheric tanks with a total capacity of 40,000  
22 gallons. The water from the atmospheric tanks is then pumped into two

hydropneumatic tanks, with a combined capacity of 20,000 gallons, where  
2 it is then discharged into the distribution system.

3 Q. Have the tanks you just referred to been replaced since the original  
4 installation date?

5 A. No, they have not. Both the atmospheric and hydropneumatic tanks are  
6 thirty-eight years old. The existing treatment equipment, storage tanks,  
7 buildings and mechanical equipment have all reached the end of their  
8 useful lives and need to be replaced. In particular, failure to replace the  
9 tanks in the near future could result in a tank failure and a loss of supply.

10 Q. Mr. Ware, how would you describe the water quality for the MHCWS?

11 A. The existing MHCWS wells are high in radon, sulfides, iron and  
12 manganese. The radon and sulfides are currently being removed via a  
13 packed tower aeration system, but the iron and manganese levels are not  
14 currently removed from the finished water. The current levels of iron and  
15 manganese exceed the secondary Safe Drinking Water Act (SDWA)  
16 standards and result in staining of water fixtures and the coloring of light  
17 laundry.

18 Q. Does the packed tower aeration work adequately for the removal of the  
19 radon and sulfides?

20 A. Yes, although the structure of the aeration tower is rusting through and is  
21 in need of replacement. The tower packing has also become fouled and  
22 needs to be replaced as well if this system is to continue to function  
23 properly.

1 Q. How long can the existing Maple Hills water supply system continue to  
2 function properly without being replaced?

3 A. The existing treatment system needs to be replaced this year. The  
4 existing tanks and buildings need to be replaced in the next two years at  
5 the latest.

6 Q. Are there any other concerns or issues with the operation of the MHCWS?

7 A. Yes, there are. As I just mentioned, the water from the existing wells  
8 needs to be treated to remove the radon and sulfides. Additionally, the  
9 iron and manganese in the raw water should be removed to below the  
10 SDWA secondary standards. Furthermore, there is no emergency power  
11 located at the MHCWS and as a result whenever there is a power outage  
12 this system is without water.

13 Q. Mr. Ware, please explain the options available to PEU for improving the  
14 treatment and storage for the MHCWS.

15 A. There are two available options to solve the challenges at the MHCWS.  
16 Option One is to continue with on-site water supply, treatment and  
17 storage, which would require replacing the existing atmospheric storage  
18 and hydropneumatic tanks, replacing the existing packed tower treatment  
19 system, adding treatment for iron and manganese, constructing a new  
20 community water station to house the treatment and pumps and installing  
21 a new emergency generator. The Option Two is to construct an  
22 interconnection with, and purchase water from, the Town of Derry Water  
23 Department. The interconnection would eliminate the need to complete

1 any of the upgrades detailed in Option One and would involve a  
2 significantly lower level of capital expenditure.

3 Q. What is the cost of Option One?

4 A. As I mentioned earlier, the existing building, booster pumps, station piping,  
5 atmospheric storage, hydropneumatic storage, and treatment facilities are  
6 nearing the end of their useful life. As a result, Option One would require  
7 completely replacing the existing facilities. The total capital cost required  
8 to accomplish this replacement, including the addition of emergency  
9 power facilities, is estimated to be \$869,300. A spreadsheet detailing this  
10 cost is attached as Schedule DLW-1.

11 Q. What would the annual operating cost be for the upgraded facility?

12 A. The annual operating cost for Option One, including the debt service and  
13 depreciation expenses, is estimated to be \$102,738 per year as shown on  
14 Schedule DLW-1.

15 Q. Mr. Ware, please describe what is required to implement Option Two,  
16 purchasing water from the Derry Water Department.

17 A. This option requires the construction of an interconnection with the Town  
18 of Derry Water Department consisting of approximately 1,240 lineal feet of  
19 6" water main and a small booster station with emergency power. The  
20 cost to implement this option is \$593,985. A spreadsheet detailing this  
21 cost is also shown on Schedule DLW-1.

22 Q. What would the annual operating cost be to purchase water from the  
23 Derry Water Department?

1 A. The estimated annual operating cost for this option would be \$86,858,  
2 which includes the cost of purchasing water, the debt service, and the  
3 depreciation expense.

4 Q. Mr. Ware, in your opinion, what is the preferred method for upgrading the  
5 MHCWS?

6 A. The preferred method of upgrading the MHCWS water supply works is the  
7 interconnection with the Town of Derry Water system due to the fact that  
8 the annual operating costs of purchasing water from the Derry Water  
9 Department are approximately 18% less than replacing the existing  
10 treatment, storage, and pumping facilities. In addition to the cost  
11 considerations, the interconnection is favored by the NHDES as  
12 recognized by their funding of a 25% grant to interconnect water systems.  
13 PEU intends to proceed with plans to improve the MHCWS by purchasing  
14 water from the Derry Water Department because it is financially and  
15 operationally the proper solution to the MHCWS water supply needs.

16 Q. Does this complete your testimony?

17 A. Yes.

**Pennichuck East Utilities  
Maple Hills SRF Estimate**

Revised February 1, 2008

	<b>On Site with Treatment</b>		<b>Derry Interconnection</b>
<b>Site Work:</b>			
Clearing & Grubbing -	\$ 15,000		\$ 5,000
Driveway & Parking -	\$ 35,000		\$ 10,000
Site Excavation, backfill -	\$ 35,000		\$ 16,000
Easement Aquisition -	\$ -		\$ 25,000
<b>Utility Piping:</b>			
Water (between existing and new stations) -	\$ 20,000	See next worksheet	\$ 237,186
Gas -	\$ 2,500		\$ -
Drainage -	\$ 10,000		\$ 5,000
Landscaping -	\$ 5,000		\$ 10,000
<b>Building Structure:</b>			
Frost Wall, Block, Roof, Doors, Slab - (40'x40' Building @\$150/SF)	\$ 240,000	18'x24' Building @\$150/SF	\$ 64,800
<b>Process:</b>			
Iron & Manganese -	\$ 85,000		\$ -
Radon, Hydrogen Sulfide -	\$ 40,000		\$ -
Chem Feed - Chlorine, Corrosion Control -	\$ 5,000	Chlorine & Phosphate	\$ 5,000
Storage (40,000 Gallons) -	\$ 60,000		\$ -
Backwash/Residuals -	\$ 45,000		\$ -
<b>Mechanical:</b>			
Piping -	\$ 85,000		\$ 55,000
Plumbing -	\$ 10,000		\$ 1,500
Heating -	\$ 1,500		\$ 500
Booster Pumps (4@7.5 HP) -	\$ 18,000		\$ 18,000
<b>Electrical:</b>			
Service Upgrade -	\$ 10,000		\$ -
Electrical Installations, Inc. -	\$ 110,000		\$ 62,000
Generator -	\$ 32,000		\$ 25,000
<b>Total Estimated Project Cost -</b>	<b>\$ 864,000</b>		<b>\$ 539,986</b>
<b>Project Contingency (10%) -</b>	<b>\$ 5,314</b>		<b>\$ 53,999</b>
<b>Total Estimated Project Cost -</b>	<b>\$ 869,314</b>		<b>\$ 593,985</b>
Booster Station costs -	\$ 744,314		\$ 356,799
Water Main Costs -	\$ 20,000		\$ 237,186
Storage Costs -	\$ 105,000		\$ -

<b>Pennichuck East Utility, Inc.</b>				
<b>Maple Hills SRF and Interconnection Grant</b>				
<b>Water Main Installation</b>				
<b>Revised 2/1/2008</b>				
<b>Materials</b>				
Item Description	Quantity	Unit	Unit Price	Extension
5' Valve Box Complete	-	13 EA	\$81.00	\$1,053
8" CI 52 DIPCL	-	5 LF	\$14.54	\$73
6" CI 52 DIPCL	-	1240 LF	\$10.55	\$13,082
8"x8"x6" MJ Hydrant Tee	-	1 EA	\$191.00	\$191
6"x6"x4" MJ Tee	-	2 EA		\$198
8" Gate Valve	-	2 EA	\$607.00	\$1,214
6" Gate Valve	-	7 EA	\$389.00	\$2,723
4" Gate Valve	-	2 EA	\$304.00	\$608
6"X4" MJ Reducer	-	1 EA	\$38.00	\$38
6" MJ Fittings	-	6 EA	\$69.00	\$414
8" Couplings	-	2 EA	\$101.00	\$202
6" Couplings	-	1 EA	\$85.00	\$85
4" Couplings	-	3 EA	\$62.00	\$186
8" Meg-A-Lugs	-	6 EA	\$36.00	\$216
6" Meg-A-Lugs	-	17 EA	\$31.00	\$527
4" Meg-A-Lugs	-	7 EA	\$1,250.00	\$8,750
Shop Made Thrust Blocks	-	9 EA	\$38.00	\$342
1" type K copper	-	204 LF	\$9.00	\$1,836
1" Curb Stop	-	17 EA	\$78.00	\$1,326
1" Corporation	-	17 EA	\$75.00	\$1,275
Service Box - Complete	-	17 EA	\$29.00	\$493
Gravel Subbase - 24"	-	736 CY	\$24.00	\$17,662
Pavement Trench Repair - 3"x6' wide	-	115 Tons	\$195.00	\$22,479
Pavement Overlay (26' wide x 1.5")	-	299 Tons	\$85.00	\$25,374
Sand Bedding	-	552 CY	\$20.00	\$11,039
			<b>Materials Sub Total -</b>	<b>\$111,386</b>
			5 % materials contingency -	\$5,569
			<b>Materials Totals minus Contractor mark up -</b>	<b>\$116,956</b>
			Contractor Materials Mark up @ 10% -	\$11,696
			<b>Project Total - Materials -</b>	<b>\$128,651</b>
<b>Labor, Equipment and Materials</b>				
Item Description	Quantitv	Unit	Unit Price	Extension
Mobilization/Demobilization	#	1 LS	\$6,000.00	\$6,000
Pipe Crew - Fittings/valves/Hydrants	-	4 DAY	\$3,200.00	\$12,800
Pipe Crew - Water Main Installation	-	8 DAY	\$3,200.00	\$24,800
<b>Service Crew</b>	-	2 DAY	\$2,250.00	\$4,500
Air Release Fitting Crew	-	1 DAY	\$2,250.00	\$2,250
Pressure Testing and CI2	-	2 EA	\$450.00	\$900
			<b>LEM Subtotal -</b>	<b>\$51,250</b>
			<b>Project Total -</b>	<b>\$179,901</b>
			<b>Overall Project Contingency @ 10% -</b>	<b>\$17,990</b>
			<b>Project Total w/out Internal Overhead -</b>	<b>\$197,891</b>
			External Engineering ( Survey, soils, structural, site plan) -	\$28,000
			Internal Overhead (Engineering, Project Mgt) @ 5% -	\$11,295
			<b>Total Estimated Cost -</b>	<b>\$237,186</b>
Pipe Installation	-	160 LF per day		

<b>Pennichuck East Utility, Inc</b>	
<b>Maple Hills SRF Upgrade</b>	
<b>Life Cycle Cost Analysis</b>	
<b>Revised February 1, 2008</b>	
<b>On Site Storage and Treatment -</b>	
Well Electricity (10 HP)* -	\$ 2,347
Annual Well maintenance -	\$ 1,333
Annual Well Water Quality Sampling -	\$ 6,318
Treatment System Labor (4 hours per week)-	\$ 8,320
Zone Booster Electricity (10 HP @ 24 Hrs/day) -	\$ 6,582
Radon Blower Electricity (10 HP when wells are running) -	\$ 2,347
Misc. Electricity -	\$ 1,975
Treatment Chemicals -	\$ 6,500
Depreciation on Water Mains @ 1.33% -	\$
Deprecation on Storage @ 2% -	\$ 2,100
Depreciation on Zone Booster and treatment @ 2.5% -	\$ 18,608
Property Taxes -	\$ 17,169
Debt Service on Total Project -	<u>29,139</u>
Estimated Annual Operating Cost -	\$ 102,738
Estimated Annual Increase in PEU Bill -	19.33
<b>Purchased Water from Derry Water Department -</b>	
Purchased Water Cost -	\$ 44,092
Zone Booster Electricity (10 HP @ 24 Hrs/day) -	\$ 6,582
Zone Booster Labor & Equipment (4 hours per month) -	\$ 693
Misc. Electricity -	\$ 1,975
Depreciation on Water Mains @ 1.33% -	\$ 3,155
Depreciation on Zone Booster @ 2.5% -	\$ 8,920
Deprecation on Storage @ 2% -	\$ -
Property Taxes -	\$ 11,731
Debt Service on Total Project -	\$ 19,910
Less 25% grant on interconnect -	<u>\$ (10,200)</u>
Estimated Annual Operating Cost -	\$ 86,858
Estimated Annual Increase in PEU Bill -	16.35
<b>Model Data:</b>	
Average cost per KwHr -	\$ 0.13
SRF Loan Rate -	3.35%
Number of in PEU customers -	5314
*Based on (gpd/house)	201
Existing Maple Hills Well production (gpm)-	95
Number of customers in Maple Hills -	182
Town Mil Rate -	\$19.8
Purchased Water Cost from Derry (per 748 gallons)-	\$ 2.47
On site Capex per Estimate-	\$ 869,314
Interconnection Capex per Estimate -	\$ 593,985

<b>Pennichuck East Utilities</b>			
<b>Maple Hills SRF Estimate</b>			
<b>Anticipated Monthly Payment</b>			
<b>27-Jun-07</b>			
	Amount of Loan -	\$ 593,985	
	Mortgage Style Payment -	(\$3,399.87)	per month
<b>Data:</b>	Duration of Bond -	20	Years
	Interest Rate -	3.3520%	
	Number of Payment Periods -	240	