Figure 1: Twin Ridge Interconnection Point Route 125 and Walton Road

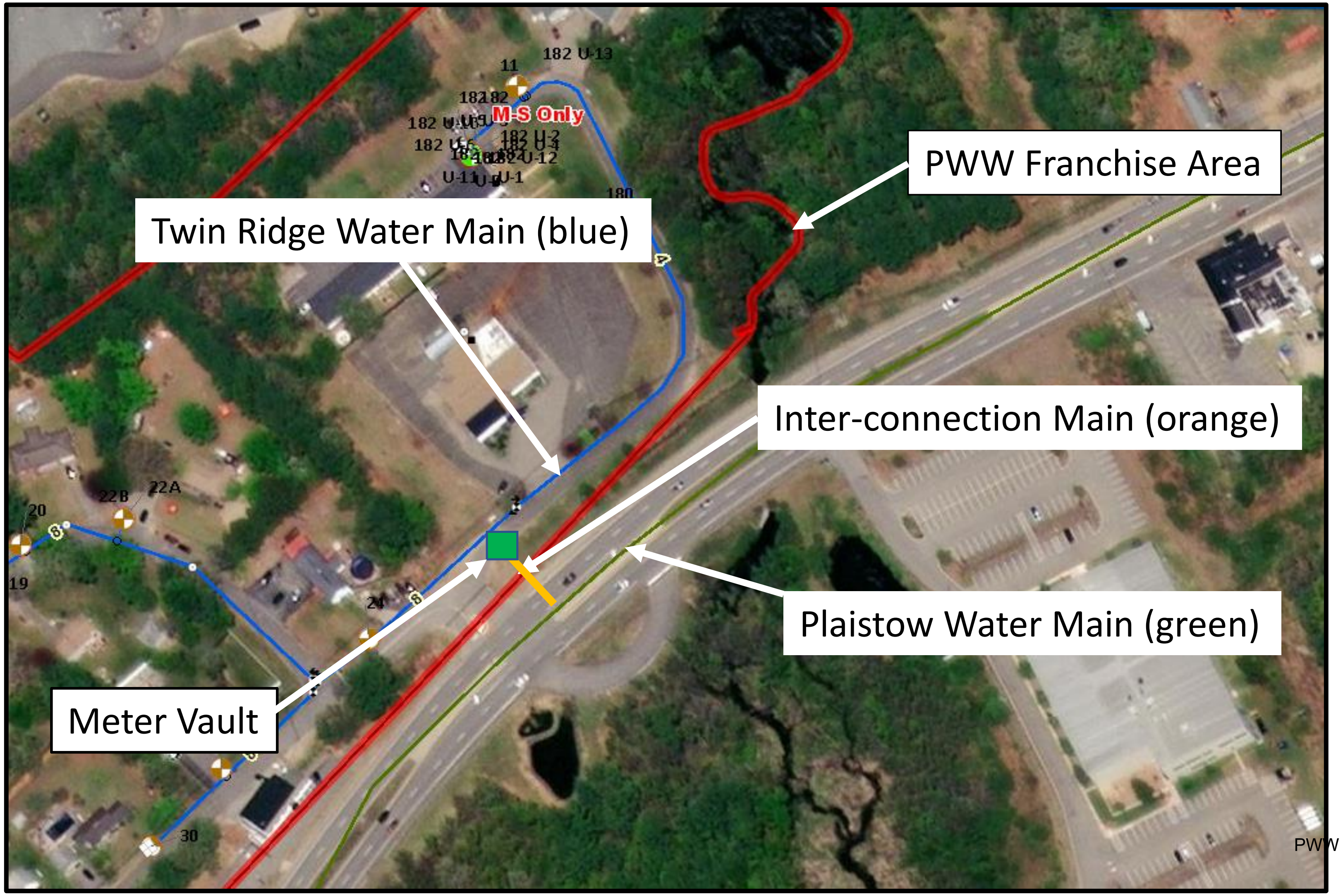

Figure 2 Sweet Hill Inter-connection

Sweet Hill Service Area (red)

Sweet Hill Water Main (orange)

Inter-connection Water Main (yellow)

Town of Plaistow Water Main (blue)

Town of Plaistow Storage Tank (blue)

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Robert R. Scott, Commissioner

August 31, 2020 – **Revised September 1, 2021**

John Boisvert, Chief Engineer
Pennichuck Water Works
25 Walnut Street
Nashua, NH 03061-0428

Subject: Drinking Water State Revolving Loan Fund (DWSRF) Pre-Application
FY 2020 Project Priority List
Pennichuck Water Works (PWW) and Pennichuck East Utility (PEU)

Dear Mr. Boisvert,

The purpose of this letter is to inform you that the FY 2020 DWSRF Project Priority List has been finalized and that DWSRF funding is available for the following project:

Public Water System	Project Description	Project Amount
Twin Ridge Condos	Twin Ridge Condos Interconnection with SNH Regional Water Project	$300,000
Sweet Hill Estates	Sweet Hill Estates Interconnection with SNH Regional Water Project	$240,000

The next step to move forward with project funding is to submit a final application. The required documents are listed on the Final Application Checklist available at
http://des.nh.gov/organization/divisions/water/dwgb/capacity/dwsrf.htm

Unfortunately, the following projects were not selected for DWSRF Funding:

- Penichucks Water Works; PWS #1621010: Booster Station Relocation & Replacement; Kessler Farm Tank Replacement; Harris Dam Earth Embankment and Dike Wall Improvements; and Supply Pond Dam Spillway Improvements
- PEU - Sunrise Estates; PWS #0142010: Sunrise Estates-Pumping Station and Storage Tank Replacement
- PEU/Pioneer Commercial Park; PWS #116010: Pioneer Commercial Park Station Reconstruction project
- PEU/Williamsburg; PWS #1851010: Williamsburg: Lane Road and Monticello Road Phase 2 Main Replacement
- PEU/Rolling Hills; PWS #1932010: Rolling Hills Water Main Replacement
- PEU/Gage Hill; PWS #1852020: Gage Hill Water Main Replacement

Funding for the Twin Ridge Condos and Sweet Hill Estates Interconnection with the SNH Regional Water Project is available until May 3, 2021. However, we encourage you to move forward at this time to seek the authority to borrow. The current charge rates are available at https://www.des.nh.gov/organization/divisions/water/dwgb/capacity/documents/srf-loan-charge-rates.pdf. Please be advised that these rates are subject to change.

We ask that you keep us informed of progress made toward seeking the authority to borrow. Should your project not move forward, please contact us as soon as possible. If you have any questions, please contact me at (603) 271-7017 or at johnna.mckenna@des.nh.gov.

Sincerely,

Johnna McK

Johnna McKenna
Drinking Water and Groundwater Bureau

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge
Address: Connection will be made at the hydrant near the intersection of Walton Road and State Rt. 125 to the 8" main

Notes:
Max HGL: 320, Min HGL: 279, Future HGL: 286
Approx. 40 ft of 8" line
SRF PROJECT
No Booster Station Required

**must pay the MSDS charge + $0.50/CCF and need either a 2" meter or 3" compound meter (160 gpm vs. 350 gpm)

Porperty Tax Rates:
Plaistow: $21.31/$1000
State: $6.6/$1000

Current Electrical Costs (2019 Total)		
PWW	Kilowatts	66888
acct # 2030410000 - Unitil -Delivery	Delviery Service	$ 4,139.49
acct # 7591033 - Constellation - Supply	Supplier Service	$ 5,591.83
PEU Well #7	Kilowatts	148
aact # 2034853000 - Unitil	Power & Demand	$ 732.00
acct # 7591044 - Constellation	Power Charge	$ 12.28
PEU & PWW Total:		$ 10,475.60

Current Labor Costs (2019 Total)		
	Hours	723
	Wages	$ 24,790.28

Current Chemical Costs (2019 Total)			
Chemical	# of Gal or Bag	$/(Gal or Bag)	Cost
Chlorine	75	$ 0.79	$ 59.27
Caustic	20	$ 1.28	$ 25.55
Salt	944	$ 8.13	$ 7,676.61
		Total:	$ 7,761.42

Current Property Taxes		
Assest Value	$ 459,813.09	
Land Tax Payment	$ 2,049.00	2020 Tax Bill
Local Tax	$ 9,798.62	Local tax is $21.31/$1000
State Tax	$ 3,034.77	State tax is $6.6/$1000
Total Tax:	$ 14,882.38	

Current Annual PWW Twin Ridge Revenue Requirements

Property Tax Expense	$ 14,882.38
Electric Expense	$ 10,475.60
Labor Expense	$ 24,790.28
Chemical Expense	$ 7,761.42
Total Current PWW Expenses	$ 57,909.69

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge - Option 1 -100% Purchased Water, No Booster Pump

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	CoA	
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	331	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	331	
3	Furnish and install 8" diameter DI water main	LF	120	$ 200.00	$ 24,000.00	331	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	331	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	331	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	331	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	334	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	331	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	331	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	COR	
11	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	COR	
				Construction Total:	$ 217,000.00		
				Construction Contingency:	$ 20,000.00	331	
				Engineering/Planning:	$ 12,000.00	331	
				MSDC Fee (1.5" Meter):	$ 8,973.00	306 or 309	If fee is based on gpd it is $4.02/gpd for meters 3" or larger according to the MWW MSDC Rules and Regulations on page 39
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00	306 or 309	
				Total Project Cost:	$ 261,173.00		

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on New Construction (Local and State)	$ 4,640.04	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000

Purchased Water Costs:

Item No.	Item	Rate	Quantity	Max monthly use + extra 30% for 3 summer months, max monthly use for remaining 9 months. There is no irrigation at the Condo Association.
1	Master Meter Flow	gal/year	7740000	Based on June 2021 usage of 600,000 gal
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00	
3	Annual Consumption Charge	$7/1000 gal	$ 54,180.00	
		Annual Total:	$ 55,314.00	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge - Option 2 - 100% Purchased Water with Booster Pump

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00
3	Furnish and install 8" diameter DI water main	LF	120	$ 200.00	$ 24,000.00
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00
11	Station Upgrades (incuding boosters)	LS	1	$ 75,000.00	$ 75,000.00
				Construction Total:	$ 267,000.00
				Construction Contingency:	$ 24,000.00
				Engineering/Planning:	$ 12,000.00
				MSDC Fee (1.5" Meter):	$ 8,973.00
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00
				Total Project Cost:	$ 315,173.00

If fee is based on gpd it is $4.02/gpd for meters 3" or larger according to the MWW MSDC Rules and Regulations on page 39

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 6,844.93	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 2,049.00	
3	Labor	$ 12,395.14	50% of 2019 Total
4	Electric Costs	$ 5,237.80	50% of 2019 Total
	Total:	$ 21,289.07	

Purchased Water Costs:

Item No.	Item	Rate	Quantity	
				Max monthly use + extra 30% for 3 summer months, max monthly use for remaining 9 months. There is no irrigation at the Condo Association.
1	Master Meter Flow	gal/year	7740000	Based on June 2021 usage of 600,000 gal
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00	
3	Annual Consumption Charge	$7/1000 gal	$ 54,180.00	
		Annual Total:	$ 55,314.00	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge - Option 3 - Demolish and Rebuild Station

Construction Costs:

Item No.	Item	Unit	Quantity		Unit Price		Cost Extension	Comments
1	Mobilization	LS	1	$	20,000.00	$	20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$	10,000.00	$	10,000.00	
3	Furnish and install 8" diameter DI water main	LF	120	$	200.00	$	24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$	750.00	$	3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$	1,500.00	$	3,000.00	
6	2" Air Release Assembly	EA	2	$	2,500.00	$	5,000.00	
7	Meter Pit	EA	1	$	42,500.00	$	42,500.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$	175.00	$	8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$	180.00	$	18,000.00	
10	Station Demolition	LS	1	$	25,000.00	$	25,000.00	
11	Station Rebuild	LS	1	$	650,000.00	$	650,000.00	
12	New Treatment System	LS	1	$	100,000.00	$	100,000.00	new pumps, composite vessels, filter heads, piping, chloramine removal
13	Well Decommissioning (all wells except well 8)	VF	4985	$	11.00	$	54,835.00	
					Construction Total:	$	964,085.00	
					Construction Contingency:	$	115,690.20	
					Engineering/Planning:	$	12,000.00	
					MSDC Fee (1.5" Meter):	$	8,973.00	based on amount of purchased water 180000 gal/month?
					Plaistow Connection Fee (1.5" Meter):	$	3,200.00	
					Total Project Cost:	$	1,103,948.20	

Operations and Maintenance Costs:

Item No.	Item		Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$	28,243.25	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$	2,049.00	
3	Labor	$	24,790.28	2019 Total, 723 hours worked on station
4	Chemical Costs	$	9,261.42	2019 Total + $1500 for Cholarmine Treatment
5	Electric Costs	$	10,475.60	2019 Total
	Total:	$	64,343.95	
	2019 Total with Inflation (7%):	$	68,848.03	

Purchased Water Costs:

Item No.	Item	Rate		Quantity
1	Master Meter Flow	gal/year		540000
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$	1,134.00
3	Annual Consumption Charge	$7/1000 gal	$	3,780.00
		Annual Total:	$	4,914.00

Summer Usage Assumptions

Well 8 Capacity:	20000	gpd	600000	gal/month
Monthly Max + 30% for Summer Usage	780000	gal/month		
Difference (amount of purchased water):	180000	gal/month for 3 summer months		

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge Options 1-3 Net Present Value Analysis for PEU Expenses

Option 1: 100% Purchased with no booster pumps

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	
11	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	
				Estimated Capital Cost:	$ 217,000.00	$ 3,000.00

Option 2: 100% Purchased with booster pumps

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	
11	Station Upgrades (incuding boosters)	LS	1	$ 75,000.00	$ 75,000.00	$ 10,000.00
				Estimated Capital Cost:	$ 267,000.00	$ 13,000.00

Option 3: Supplemental Source (Demolish and Rebuild Station)

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	
11	Station Rebuild	LS	1	$ 650,000.00	$ 650,000.00	
12	New Treatment System and Brine Holding Tanks	LS	1	$ 175,000.00	$ 175,000.00	$ 30,000.00
13	Well Decommissioning (all wells except well 8)	VF	4985	$ 11.00	$ 54,835.00	
				Estimated Captial Cost:	$ 1,039,085.00	$ 33,000.00

Inflation Value:		3%
Bond Int Rate		5%

			Option 1	Option 2	Option 3
Term (yrs)		20	$ 261,173.00	$ 315,173.00	$ 1,103,948.20
(SRF Interest Rate)		1.256%			
SRF	P&I		($14,848.82)	($17,056.31)	($17,056.31)
Bond	P&I		$0.00	($1,217.52)	($64,510.88)
			($14,848.82)	($18,273.83)	($81,567.19)

Option 1	Option 2	Option 3	
$ 261,173.00	$ 300,000.00	$ 300,000.00	SRF Principal
$ -	$ 15,173.00	$ 803,948.20	Bond

	Operation and Maintenance Costs			Purchased Water Costs			Repair/Replacement		
Year	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
1	$ 4,640.04	$ 21,289.07	$ 64,343.95	$ 55,314.00	$ 55,314.00	$ 4,914.00	$ 3,000.00	$ 13,000.00	$ 33,000.00
2	$ 4,779.24	$ 21,927.74	$ 66,274.27	$ 56,973.42	$ 56,973.42	$ 5,061.42	$ 3,090.00	$ 13,390.00	$ 33,990.00
3	$ 4,922.62	$ 22,585.57	$ 68,262.50	$ 58,682.62	$ 58,682.62	$ 5,213.26	$ 3,182.70	$ 13,791.70	$ 35,009.70
4	$ 5,070.29	$ 23,263.14	$ 70,310.38	$ 60,443.10	$ 60,443.10	$ 5,369.66	$ 3,278.18	$ 14,205.45	$ 36,059.99
5	$ 5,222.40	$ 23,961.03	$ 72,419.69	$ 62,256.39	$ 62,256.39	$ 5,530.75	$ 3,376.53	$ 14,631.61	$ 37,141.79
6	$ 5,379.08	$ 24,679.86	$ 74,592.28	$ 64,124.09	$ 64,124.09	$ 5,696.67	$ 3,477.82	$ 15,070.56	$ 38,256.04
7	$ 5,540.45	$ 25,420.26	$ 76,830.05	$ 66,047.81	$ 66,047.81	$ 5,867.57	$ 3,582.16	$ 15,522.68	$ 39,403.73
8	$ 5,706.66	$ 26,182.87	$ 79,134.95	$ 68,029.24	$ 68,029.24	$ 6,043.60	$ 3,689.62	$ 15,988.36	$ 40,585.84
9	$ 5,877.86	$ 26,968.35	$ 81,509.00	$ 70,070.12	$ 70,070.12	$ 6,224.91	$ 3,800.31	$ 16,468.01	$ 41,803.41
10	$ 6,054.20	$ 27,777.40	$ 83,954.27	$ 72,172.22	$ 72,172.22	$ 6,411.66	$ 3,914.32	$ 16,962.05	$ 43,057.52
11	$ 6,235.82	$ 28,610.73	$ 86,472.89	$ 74,337.39	$ 74,337.39	$ 6,604.01	$ 4,031.75	$ 17,470.91	$ 44,349.24
12	$ 6,422.90	$ 29,469.05	$ 89,067.08	$ 76,567.51	$ 76,567.51	$ 6,802.13	$ 4,152.70	$ 17,995.04	$ 45,679.72
13	$ 6,615.58	$ 30,353.12	$ 91,739.09	$ 78,864.54	$ 78,864.54	$ 7,006.19	$ 4,277.28	$ 18,534.89	$ 47,050.11
14	$ 6,814.05	$ 31,263.71	$ 94,491.27	$ 81,230.47	$ 81,230.47	$ 7,216.37	$ 4,405.60	$ 19,090.94	$ 48,461.61
15	$ 7,018.47	$ 32,201.62	$ 97,326.00	$ 83,667.39	$ 83,667.39	$ 7,432.87	$ 4,537.77	$ 19,663.67	$ 49,915.46
16	$ 7,229.03	$ 33,167.67	$ 100,245.78	$ 86,177.41	$ 86,177.41	$ 7,655.85	$ 4,673.90	$ 20,253.58	$ 51,412.92
17	$ 7,445.90	$ 34,162.70	$ 103,253.16	$ 88,762.73	$ 88,762.73	$ 7,885.53	$ 4,814.12	$ 20,861.18	$ 52,955.31
18	$ 7,669.27	$ 35,187.58	$ 106,350.75	$ 91,425.61	$ 91,425.61	$ 8,122.09	$ 4,958.54	$ 21,487.02	$ 54,543.97
19	$ 7,899.35	$ 36,243.21	$ 109,541.27	$ 94,168.38	$ 94,168.38	$ 8,365.76	$ 5,107.30	$ 22,131.63	$ 56,180.29
20	$ 8,136.33	$ 37,330.51	$ 112,827.51	$ 96,993.43	$ 96,993.43	$ 8,616.73	$ 5,260.52	$ 22,795.58	$ 57,865.70

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Twin Ridge Options 1-3 Net Present Analysis

NPV Discount Rate 5 %
0.05

Option 1 - 100% Purchased Water with No Booster Pumps

Year

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (4,640.04)	$ (4,779.24)	$ (4,922.62)	$ (5,070.29)	$ (5,222.40)	$ (5,379.08)	$ (5,540.45)	$ (5,706.66)	$ (5,877.86)	$ (6,054.20)	$ (6,235.82)	$ (6,422.90)	$ (6,615.58)	$ (6,814.05)	$ (7,018.47)	$ (7,229.03)	$ (7,445.90)	$ (7,669.27)	$ (7,899.35)	$ (8,136.33)	($74,077.19)
Repair and Replacement Costs		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (5,260.52)	($1,982.63)
Purchased Water Costs		$ (55,314.00)	$ (56,973.42)	$ (58,682.62)	$ (60,443.10)	$ (62,256.39)	$ (64,124.09)	$ (66,047.81)	$ (68,029.24)	$ (70,070.12)	$ (72,172.22)	$ (74,337.39)	$ (76,567.51)	$ (78,864.54)	$ (81,230.47)	$ (83,667.39)	$ (86,177.41)	$ (88,762.73)	$ (91,425.61)	$ (94,168.38)	$ (96,993.43)	($883,076.04)
P&I Payment		($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($14,848.82)	($185,049.17)
																					Total NPV=	($1,144,185.03)

Option 2 - 100% Purchased Water with Booster Pumps

Year

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (21,289.07)	$ (21,927.74)	$ (22,585.57)	$ (23,263.14)	$ (23,961.03)	$ (24,679.86)	$ (25,420.26)	$ (26,182.87)	$ (26,968.35)	$ (27,777.40)	$ (28,610.73)	$ (29,469.05)	$ (30,353.12)	$ (31,263.71)	$ (32,201.62)	$ (33,167.67)	$ (34,162.70)	$ (35,187.58)	$ (36,243.21)	$ (37,330.51)	($339,875.35)
Repair and Replacement Costs	**$200 for approximate annual pump maintenance**	$ (200.00)	$ (206.00)	$ (212.18)	$ (218.55)	$ (225.10)	$ (231.85)	$ (238.81)	$ (245.97)	$ (253.35)	$ (260.95)	$ (268.78)	$ (276.85)	$ (285.15)	$ (293.71)	$ (302.52)	$ (311.59)	$ (320.94)	$ (330.57)	$ (340.49)	$ (22,795.58)	($11,652.19)
Purchased Water Costs		$ (55,314.00)	$ (56,973.42)	$ (58,682.62)	$ (60,443.10)	$ (62,256.39)	$ (64,124.09)	$ (66,047.81)	$ (68,029.24)	$ (70,070.12)	$ (72,172.22)	$ (74,337.39)	$ (76,567.51)	$ (78,864.54)	$ (81,230.47)	$ (83,667.39)	$ (86,177.41)	$ (88,762.73)	$ (91,425.61)	$ (94,168.38)	$ (96,993.43)	($883,076.04)
P&I Payment		($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($18,273.83)	($227,732.30)
																					Total NPV=	($1,462,335.89)

Option 3 - Supplemental Source (Demolish and Rebuild Station)

Year

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (64,343.95)	$ (66,274.27)	$ (68,262.50)	$ (70,310.38)	$ (72,419.69)	$ (74,592.28)	$ (76,830.05)	$ (79,134.95)	$ (81,509.00)	$ (83,954.27)	$ (86,472.89)	$ (89,067.08)	$ (91,739.09)	$ (94,491.27)	$ (97,326.00)	$ (100,245.78)	$ (103,253.16)	$ (106,350.75)	$ (109,541.27)	$ (112,827.51)	($1,027,237.30)
Repair and Replacement Costs	**$500 for approximate annual pump main. & media**	$ (500.00)	$ (515.00)	$ (530.45)	$ (546.36)	$ (562.75)	$ (579.64)	$ (597.03)	$ (614.94)	$ (633.39)	$ (652.39)	$ (671.96)	$ (692.12)	$ (712.88)	$ (734.27)	$ (756.29)	$ (778.98)	$ (802.35)	$ (826.42)	$ (851.22)	$ (57,865.70)	($29,460.93)
Purchased Water Costs		$ (4,914.00)	$ (5,061.42)	$ (5,213.26)	$ (5,369.66)	$ (5,530.75)	$ (5,696.67)	$ (5,867.57)	$ (6,043.60)	$ (6,224.91)	$ (6,411.66)	$ (6,604.01)	$ (6,802.13)	$ (7,006.19)	$ (7,216.37)	$ (7,432.87)	$ (7,655.85)	$ (7,885.53)	$ (8,122.09)	$ (8,365.76)	$ (8,616.73)	($78,450.95)
P&I Payment		($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($81,567.19)	($1,016,507.50)
																					Total NPV=	($2,151,656.67)

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Sweet Hill
Address: Connection will be made at the intersection of Partridge Lane and Sweet Hill Rd

Notes:
Max HGL: 337, Min HGL: 302, Future HGL: 286
Max Pressure: 72.7 psi, Min Pressure: 57.6 psi, Future Pressure: 51 psi
Booster Station Elevation is at 169 ft
Approx. 910 ft of 4" if we stay in the shoulder
PVC Pipe
SRF PROJECT

Second highest customer is at 173 ft in elevation.

**need to pay a meter charge for either a 1-1/2" or 2" master meter (100gpm max vs. 160 gpm max)

Porperty Tax Rates:
Plaistow: $21.31/$1000
State: $6.6/$1000

Current Electrical Costs (2019 Total)		
Kilowatts		25119
acct # 2031 Delivery Service	$	2,270.28
acct # 7591 Supplier Service	$	2,122.92
Total:	$	4,393.20

Current PWW Sweet Hill Revenue Requirements		
Property Tax Expense	$	18,766.59
Electric Expense	$	4,393.20
Labor Expense	$	9,309.70
Chemical Costs		
Total Current PWW Expenses		

Current Labor Costs		
Kilowatts SH		25119
Kilowatts TR		66888
% SH/TR		0.375538213
Wages TR	$	24,790.28
Estimated Wages SH	$	9,309.70

Labor Cost is estimated based on electrical usage

Estimated Current Labor Cost		
TR Labor Cost	$	24,790.28
SH 50% Reduced Cost	$	12,395.14

Current Chemical Costs			
Assumed:	$	200.00	Waiting for information

Current Property Taxes			
Assest Value	$	360,537.26	
Land Tax Payment	$	8,704.00	2020 Tax Bill
Local Tax	$	7,683.05	Local tax is $21.31/$1000
State Tax	$	2,379.55	State tax is $6.6/$1000
Total:	$	18,766.59	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Sweet Hill - Option 1 - 100% Purchased with Boosters

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00
11	Well Decommissioning	VF	1550	$ 11.00	$ 17,050.00
				Construction Total:	$ 323,700.00
				Construction Contingency:	$ 38,844.00
				Engineering/Planning:	$ 12,000.00
				MSDC Fee (1.5" Meter):	$ 8,973.00
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00
				Total Project Cost:	$ 386,717.00

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 9,977.66	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 8,704.00	
3	Labor	$ 6,197.57	Assumed 25% of Twin Ridge Annual Labor Costs
5	Electric Costs	$ 4,393.20	2019 Total
	Total:	$ 24,879.23	

Purchased Water Costs:

Item No.	Item	Rate	Quantity
1	Master Meter Flow	gal/year	3555000
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00
3	Annual Consumption Charge	$7/1000 gal	$ 24,885.00
		Annual Total:	$ 26,019.00

Summer Usage Assumptions

Number of Summer Usage Months:	5	months
Average GPD without outside usage:	150	gpd per household
Average GPD with outside usage:	1000	gpd per household
Number of Customers:	30	
Odd/Even Watering:	15	Customers watering per day
Summer Usage per Day:	17250	gpd
Summer Usage per Month:	517500	gal per month, assumed 30 days per month
Total Summer Usage:	2587500	gal
Total Non-Summer Usage:	967500	gal, assumed 30 days per month in summer months
Total Annual Usage:	3555000	gal/year

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Sweet Hill - Option 2 - Supplemental Source

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	CoA
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00	309
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00	309
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00	309
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00	309
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00	309
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00	309
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00	309
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	309
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00	309
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00	311
11	New Treatment System	LS	1	$ 50,000.00	$ 50,000.00	320
				Construction Total:	$ 356,650.00	
				Construction Contingency:	$ 42,798.00	309
				Engineering/Planning:	$ 12,000.00	309
				MSDC Fee (3/4" Meter):	$ 2,324.00	306 or 309
				Plaistow Connection Fee (3/4" Meter):	$ 1,300.00	306 or 309
				Total Project Cost:	$ 415,072.00	

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 11,483.51	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 8,704.00	
3	Labor	$ 12,395.14	Assumed 50% of Twin Ridge Annual Labor Costs
4	Chemical Costs	$ 200.00	
5	Electric Costs	$ 4,393.20	2019 Total
	Total:	$ 32,782.65	

Purchased Water Costs:

Item No.	Item	Rate	Quantity
1	Master Meter Flow	gal/year	2666250
2	Annual Meter Charge (3/4" Meter)	$63/quarter	$ 252.00
3	Annual Consumption Charge	$7/1000 gal	$ 18,663.75
		Annual Total:	$ 18,915.75

Summer Usage Assumptions

Number of Summer Usage Months:	5	months
Average GPD without outside usage:	150	gpd per household
Average GPD with outside usage:	1000	gpd per household
Number of Customers:	30	
Odd/Even Watering:	15	Customers watering per day
Summer Usage per Day:	17250	gpd
Summer Usage per Month:	517500	gal per month, assumed 30 days per month
Total Summer Usage:	2587500	gal
Total Non-Summer Usage:	967500	gal, assumed 30 days per month in summer months
Total Annual Usage:	3555000	gal/year
Amount of Purchased Water:	2666250	gal/year, assumed 75% purchased water
Amount of PEU Water:	888750	gal/year

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Sweet Hill Options 1 and 2 Net Present Value Analysis for PEU Expenses

Option 1: 100% Purchased Water with Booster Pumps

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00	
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00	
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00	
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00	
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00	
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00	
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00	$ 15,000.00
11	Well Decommissioning	VF	1550	$ 11.00	$ 17,050.00	
				Estimated Capital Cost:	$ 323,700.00	$ 15,000.00

Option 2: Supplemental Source

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00	
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00	
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00	
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00	
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00	
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00	
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00	
11	New Treatment System	LS	1	$ 50,000.00	$ 50,000.00	$ 10,000.00
				Estimated Capital Cost:	$ 356,650.00	$ 10,000.00

Inflation Value: 3%

Option 1	Option 2				Option 1	Option 2	
		Term (yrs)		20	$ 386,717.00	$ 415,072.00	
		Interest Rate:		1.256%			5% Bond Int Rate
$ 240,000.00	$ 240,000.00	SRF	P&I		($13,645.05)	($13,645.05)	
$ 136,717.00	$ 175,072.00	Bond	P&I		($10,970.53)	($14,048.23)	
					($24,615.57)	($27,693.28)	

Year	Operation and Maintenance Costs Option 1	Operation and Maintenance Costs Option 2	Purchased Water Costs Option 1	Purchased Water Costs Option 2	Repair/Replacement Option 1	Repair/Replacement Option 2	Station Rebuild Costs Option 1	Station Rebuild Costs Option 2
1	$ 24,879.23	$ 32,782.65	$ 26,019.00	$ 18,915.75	$ 15,000.00	$ 10,000.00	$ 200,000.00	$ 260,000.00
2	$ 25,625.60	$ 33,766.13	$ 26,799.57	$ 19,483.22	$ 15,450.00	$ 10,300.00	$ 206,000.00	$ 267,800.00
3	$ 26,394.37	$ 34,779.12	$ 27,603.56	$ 20,067.72	$ 15,913.50	$ 10,609.00	$ 212,180.00	$ 275,834.00
4	$ 27,186.20	$ 35,822.49	$ 28,431.66	$ 20,669.75	$ 16,390.91	$ 10,927.27	$ 218,545.40	$ 284,109.02
5	$ 28,001.79	$ 36,897.17	$ 29,284.61	$ 21,289.84	$ 16,882.63	$ 11,255.09	$ 225,101.76	$ 292,632.29
6	$ 28,841.84	$ 38,004.08	$ 30,163.15	$ 21,928.54	$ 17,389.11	$ 11,592.74	$ 231,854.81	$ 301,411.26
7	$ 29,707.10	$ 39,144.20	$ 31,068.05	$ 22,586.39	$ 17,910.78	$ 11,940.52	$ 238,810.46	$ 310,453.60
8	$ 30,598.31	$ 40,318.53	$ 32,000.09	$ 23,263.99	$ 18,448.11	$ 12,298.74	$ 245,974.77	$ 319,767.21
9	$ 31,516.26	$ 41,528.08	$ 32,960.09	$ 23,961.91	$ 19,001.55	$ 12,667.70	$ 253,354.02	$ 329,360.22
10	$ 32,461.75	$ 42,773.93	$ 33,948.89	$ 24,680.76	$ 19,571.60	$ 13,047.73	$ 260,954.64	$ 339,241.03
11	$ 33,435.60	$ 44,057.15	$ 34,967.36	$ 25,421.19	$ 20,158.75	$ 13,439.16	$ 268,783.28	$ 349,418.26
12	$ 34,438.67	$ 45,378.86	$ 36,016.38	$ 26,183.82	$ 20,763.51	$ 13,842.34	$ 276,846.77	$ 359,900.81
13	$ 35,471.83	$ 46,740.23	$ 37,096.87	$ 26,969.34	$ 21,386.41	$ 14,257.61	$ 285,152.18	$ 370,697.83
14	$ 36,535.98	$ 48,142.43	$ 38,209.78	$ 27,778.42	$ 22,028.01	$ 14,685.34	$ 293,706.74	$ 381,818.77
15	$ 37,632.06	$ 49,586.71	$ 39,356.07	$ 28,611.77	$ 22,688.85	$ 15,125.90	$ 302,517.94	$ 393,273.33
16	$ 38,761.03	$ 51,074.31	$ 40,536.75	$ 29,470.12	$ 23,369.51	$ 15,579.67	$ 311,593.48	$ 405,071.53
17	$ 39,923.86	$ 52,606.54	$ 41,752.86	$ 30,354.23	$ 24,070.60	$ 16,047.06	$ 320,941.29	$ 417,223.67
18	$ 41,121.57	$ 54,184.73	$ 43,005.44	$ 31,264.85	$ 24,792.71	$ 16,528.48	$ 330,569.53	$ 429,740.38
19	$ 42,355.22	$ 55,810.27	$ 44,295.61	$ 32,202.80	$ 25,536.50	$ 17,024.33	$ 340,486.61	$ 442,632.60
20	$ 43,625.88	$ 57,484.58	$ 45,624.47	$ 33,168.88	$ 26,302.59	$ 17,535.06	$ 350,701.21	$ 455,911.57

Station Rebuild Costs

Option 2 Station Rebuild:			
Station Rebuild 2022 Cost	$ 260,000.00		
Station Built in 1996			
Replace at year 40 or 2036			
Analysis year 2036-2022=14	$ 381,818.77	Int=	0.05
P&I at 5% interest	($30,638.13)		
Option 1 Station Rebuild:			
New Station no Tank 2022 cost	$ 200,000.00	Int=	0.05
14 Year Rebuild	$ 293,706.74		
P&I at 5% Interest	($23,567.79)		

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
1.256% Rate

Sweet Hill Options 1 & 2 Net Present Value Analysis

NPV Discount Rate 5 %
0.05

Option 1 - 100% Purchased Water with Booster Pumps

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (24,879.23)	$ (25,625.60)	$ (26,394.37)	$ (27,186.20)	$ (28,001.79)	$ (28,841.84)	$ (29,707.10)	$ (30,598.31)	$ (31,516.26)	$ (32,461.75)	$ (33,435.60)	$ (34,438.67)	$ (35,471.83)	$ (36,535.98)	$ (37,632.06)	$ (38,761.03)	$ (39,923.86)	$ (41,121.57)	$ (42,355.22)	$ (43,625.88)	($397,191.48)
Repair and Replacement Costs	**$200 for approximate annual pump maintenance**	$ (200.00)	$ (206.00)	$ (212.18)	$ (218.55)	$ (225.10)	$ (231.85)	$ (238.81)	$ (245.97)	$ (253.35)	$ (260.95)	$ (268.78)	$ (276.85)	$ (285.15)	$ (293.71)	$ (302.52)	$ (311.59)	$ (320.94)	$ (330.57)	$ (340.49)	$ (26,302.59)	($12,973.95)
Purchased Water Costs		$ (26,019.00)	$ (26,799.57)	$ (27,603.56)	$ (28,431.66)	$ (29,284.61)	$ (30,163.15)	$ (31,068.05)	$ (32,000.09)	$ (32,960.09)	$ (33,948.89)	$ (34,967.36)	$ (36,016.38)	$ (37,096.87)	$ (38,209.78)	$ (39,356.07)	$ (40,536.75)	$ (41,752.86)	$ (43,005.44)	$ (44,295.61)	$ (45,624.47)	($415,387.70)
P&I Payment		($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($24,615.57)	($48,183.36)	($48,183.36)	($48,183.36)	($48,183.36)	($48,183.36)	($48,183.36)	($48,183.36)	($379,085.44)
																					Total Net Present Value:	($1,204,638.57)

Option 2 - Supplemental Source

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (32,782.65)	$ (33,766.13)	$ (34,779.12)	$ (35,822.49)	$ (36,897.17)	$ (38,004.08)	$ (39,144.20)	$ (40,318.53)	$ (41,528.08)	$ (42,773.93)	$ (44,057.15)	$ (45,378.86)	$ (46,740.23)	$ (48,142.43)	$ (49,586.71)	$ (51,074.31)	$ (52,606.54)	$ (54,184.73)	$ (55,810.27)	$ (57,484.58)	($523,367.97)
Repair and Replacement Costs	**$400 for approximate annual pump main. & media**	$ (400.00)	$ (412.00)	$ (424.36)	$ (437.09)	$ (450.20)	$ (463.71)	$ (477.62)	$ (491.95)	$ (506.71)	$ (521.91)	$ (537.57)	$ (553.69)	$ (570.30)	$ (587.41)	$ (605.04)	$ (623.19)	$ (641.88)	$ (661.14)	$ (680.97)	$ (17,535.06)	($12,730.34)
Purchased Water Costs		$ (18,915.75)	$ (19,483.22)	$ (20,067.72)	$ (20,669.75)	$ (21,289.84)	$ (21,928.54)	$ (22,586.39)	$ (23,263.99)	$ (23,961.91)	$ (24,680.76)	$ (25,421.19)	$ (26,183.82)	$ (26,969.34)	$ (27,778.42)	$ (28,611.77)	$ (29,470.12)	$ (30,354.23)	$ (31,264.85)	$ (32,202.80)	$ (33,168.88)	($301,985.85)
P&I Payment		($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($27,693.28)	($58,331.40)	($58,331.40)	($58,331.40)	($58,331.40)	($58,331.40)	($58,331.40)	($58,331.40)	($439,136.74)
																					Total Net Present Value:	($1,277,220.90)

Replacement year
Need to add water main P&I to Station rebuild P&I

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge
Address: Connection will be made at the hydrant near the intersection of Walton Road and State Rt. 125 to the 8" main

Notes:
Max HGL: 320, Min HGL: 279, Future HGL: 286
Approx. 40 ft of 8" line
SRF PROJECT
No Booster Station Required

**must pay the MSDS charge + $0.50/CCF and need either a 2" meter or 3" compound meter (160 gpm vs. 350 gpm)
~~Water Rates:~~
~~Plaistow: $1.546/CCF (?)~~
~~PWW: $3.66/CCF~~

Porperty Tax Rates:
Plaistow: $21.31/$1000
State: $6.6/$1000

Current Electrical Costs (2019 Total)		
PWW	Kilowatts	66888
acct # 2030410000 - Unitil -Delivery	Delviery Service	$ 4,139.49
acct # 7591033 - Constellation - Supply	Supplier Service	$ 5,591.83
PEU Well #7	Kilowatts	148
aact # 2034853000 - Unitil	Power & Demanc	$ 732.00
acct # 7591044 - Constellation	Power Charge	$ 12.28
PEU & PWW Total:		$ 10,475.60

Current Labor Costs (2019 Total)		
	Hours	723
	Wages	$ 24,790.28

Current Chemical Costs (2019 Total)			
Chemical	# of Gal or Bag	$/(Gal or Bag)	Cost
Chlorine	75	$ 0.79	$ 59.27
Caustic	20	$ 1.28	$ 25.55
Salt	944	$ 8.13	$ 7,676.61
		Total:	$ 7,761.42

Current Property Taxes		
Assest Value	$ 459,813.09	
Land Tax Payment	$ 2,049.00	2020 Tax Bill
Local Tax	$ 9,798.62	Local tax is $21.31/$1000
State Tax	$ 3,034.77	State tax is $6.6/$1000
Total Tax:	$ 14,882.38	

Current Annual PWW Twin Ridge Revenue Requirements	
Property Tax Expense	$ 14,882.38
Electric Expense	$ 10,475.60
Labor Expense	$ 24,790.28
Chemical Expense	$ 7,761.42
Total Current PWW Expenses	$ 57,909.69

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge - Option 1 -100% Purchased Water, No Booster Pump

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	CoA	
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	331	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	331	
3	Furnish and install 8" diameter DI water main	LF	120	$ 200.00	$ 24,000.00	331	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	331	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	331	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	331	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	334	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	331	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	331	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	COR	
11	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	COR	
				Construction Total:	$ 217,000.00		
				Construction Contingency:	$ 20,000.00	331	
				Engineering/Planning:	$ 12,000.00	331	
				MSDC Fee (1.5" Meter):	$ 8,973.00	306 or 309	If fee is based on gpd it is $4.02/gpd for meters 3" or larger according to the MWW MSDC Rules and Regulations on page 39
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00	306 or 309	
				Total Project Cost:	$ 261,173.00		

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on New Construction (Local and State)	$ 4,640.04	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000

Purchased Water Costs:

Item No.	Item	Rate	Quantity	Max monthly use + extra 30% for 3 summer months, max monthly use for remaining 9 months. There is no irrigation at the Condo Association.
1	Master Meter Flow	gal/year	7740000	Based on June 2021 usage of 600,000 gal
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00	
3	Annual Consumption Charge	$7/1000 gal	$ 54,180.00	
		Annual Total:	$ 55,314.00	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge - Option 2 - 100% Purchased Water with Booster Pump

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter DI water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	
11	Station Upgrades (incuding boosters)	LS	1	$ 75,000.00	$ 75,000.00	
				Construction Total:	$ 267,000.00	
				Construction Contingency:	$ 24,000.00	
				Engineering/Planning:	$ 12,000.00	
				MSDC Fee (1.5" Meter):	$ 8,973.00	If fee is based on gpd it is $4.02/gpd for meters 3" or larger according to the MWW MSDC Rules and Regulations on page 39
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00	
				Total Project Cost:	$ 315,173.00	

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 6,844.93	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 2,049.00	
3	Labor	$ 12,395.14	50% of 2019 Total
4	Electric Costs	$ 5,237.80	50% of 2019 Total
	Total:	$ 21,289.07	

Purchased Water Costs:

Item No.	Item	Rate	Quantity	Max monthly use + extra 30% for 3 summer months, max monthly use for remaining 9 months. There is no irrigation at the Condo Association.
1	Master Meter Flow	gal/year	7740000	Based on June 2021 usage of 600,000 gal
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00	
3	Annual Consumption Charge	$7/1000 gal	$ 54,180.00	
		Annual Total:	$ 55,314.00	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge - Option 3 - Demolish and Rebuild Station

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	Comments
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter DI water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	
11	Station Rebuild	LS	1	$ 650,000.00	$ 650,000.00	
12	New Treatment System	LS	1	$ 100,000.00	$ 100,000.00	new pumps, composite vessels, filter heads, piping, chloramine removal
13	Well Decommissioning (all wells except well 8)	VF	4985	$ 11.00	$ 54,835.00	
				Construction Total:	$ 964,085.00	
				Construction Contingency:	$ 115,690.20	
				Engineering/Planning:	$ 12,000.00	
				MSDC Fee (1.5" Meter):	$ 8,973.00	based on amount of purchased water 180000 gal/month?
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00	
				Total Project Cost:	$ 1,103,948.20	

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 28,243.25	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 2,049.00	
3	Labor	$ 24,790.28	2019 Total, 723 hours worked on station
4	Chemical Costs	$ 9,261.42	2019 Total + $1500 for Cholarmine Treatment
5	Electric Costs	$ 10,475.60	2019 Total
	Total:	$ 64,343.95	
	2019 Total with Inflation (7%):	$ 68,848.03	

Purchased Water Costs:

Item No.	Item	Rate	Quantity
1	Master Meter Flow	gal/year	540000
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00
3	Annual Consumption Charge	$7/1000 gal	$ 3,780.00
		Annual Total:	$ 4,914.00

Summer Usage Assumptions

Well 8 Capacity:	20000	gpd	600000	gal/month
Monthly Max + 30% for Summer Usage	780000	gal/month		
Difference (amount of purchased water):	180000	gal/month for 3 summer months		

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge Options 1-3 Net Present Value Analysis for PEU Expenses

Option 1: 100% Purchased with no booster pumps

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	
11	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	
				Estimated Capital Cost:	$ 217,000.00	$ 3,000.00

Option 2: 100% Purchased with booster pumps

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Well Decommissioning	VF	5250	$ 11.00	$ 57,750.00	
11	Station Upgrades (incuding boosters)	LS	1	$ 75,000.00	$ 75,000.00	$ 10,000.00
				Estimated Capital Cost:	$ 267,000.00	$ 13,000.00

Option 3: Supplemental Source (Demolish and Rebuild Station)

Item No.	Item	Units	Quantity	Unit Cost	Total	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 20,000.00	$ 20,000.00	
2	Furnish & Install 8x8 MJ tap and sleeve	LS	1	$ 10,000.00	$ 10,000.00	
3	Furnish and install 8" diameter C-900 water main	LF	120	$ 200.00	$ 24,000.00	
4	Furnish and install 8" ductile iron, mechanical joint fittings	EA	4	$ 750.00	$ 3,000.00	
5	Furnish and install 8" diameter MJ gate valves	EA	2	$ 1,500.00	$ 3,000.00	
6	2" Air Release Assembly	EA	2	$ 2,500.00	$ 5,000.00	
7	Meter Pit	EA	1	$ 42,500.00	$ 42,500.00	$ 3,000.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	100	$ 180.00	$ 18,000.00	
10	Station Demolition	LS	1	$ 25,000.00	$ 25,000.00	
11	Station Rebuild	LS	1	$ 650,000.00	$ 650,000.00	
12	New Treatment System and Brine Holding Tanks	LS	1	$ 175,000.00	$ 175,000.00	$ 30,000.00
13	Well Decommissioning (all wells except well 8)	VF	4985	$ 11.00	$ 54,835.00	
				Estimated Captial Cost:	$ 1,039,085.00	$ 33,000.00

Inflation Value: 3%
Bond Int Rate 5%

			Option 1	Option 2	Option 3
Term (yrs)		20	$ 261,173.00	$ 315,173.00	$ 1,103,948.20
(SRF Interest Rate)		2.500%			
SRF	P&I		($16,753.50)	($19,244.14)	($19,244.14)
Bond	P&I		$0.00	($1,217.52)	($64,510.88)
			($16,753.50)	($20,461.66)	($83,755.02)

Option 1	Option 2	Option 3	
$ 261,173.00	$ 300,000.00	$ 300,000.00	SRF Principal
$ -	$ 15,173.00	$ 803,948.20	Bond

Year	Operation and Maintenance Costs Option 1	Option 2	Option 3	Purchased Water Costs Option 1	Option 2	Option 3	Repair/Replacement Option 1	Option 2	Option 3
1	$ 4,640.04	$ 21,289.07	$ 64,343.95	$ 55,314.00	$ 55,314.00	$ 4,914.00	$ 3,000.00	$ 13,000.00	$ 33,000.00
2	$ 4,779.24	$ 21,927.74	$ 66,274.27	$ 56,973.42	$ 56,973.42	$ 5,061.42	$ 3,090.00	$ 13,390.00	$ 33,990.00
3	$ 4,922.62	$ 22,585.57	$ 68,262.50	$ 58,682.62	$ 58,682.62	$ 5,213.26	$ 3,182.70	$ 13,791.70	$ 35,009.70
4	$ 5,070.29	$ 23,263.14	$ 70,310.38	$ 60,443.10	$ 60,443.10	$ 5,369.66	$ 3,278.18	$ 14,205.45	$ 36,059.99
5	$ 5,222.40	$ 23,961.03	$ 72,419.69	$ 62,256.39	$ 62,256.39	$ 5,530.75	$ 3,376.53	$ 14,631.61	$ 37,141.79
6	$ 5,379.08	$ 24,679.86	$ 74,592.28	$ 64,124.09	$ 64,124.09	$ 5,696.67	$ 3,477.82	$ 15,070.56	$ 38,256.04
7	$ 5,540.45	$ 25,420.26	$ 76,830.05	$ 66,047.81	$ 66,047.81	$ 5,867.57	$ 3,582.16	$ 15,522.68	$ 39,403.73
8	$ 5,706.66	$ 26,182.87	$ 79,134.95	$ 68,029.24	$ 68,029.24	$ 6,043.60	$ 3,689.62	$ 15,988.36	$ 40,585.84
9	$ 5,877.86	$ 26,968.35	$ 81,509.00	$ 70,070.12	$ 70,070.12	$ 6,224.91	$ 3,800.31	$ 16,468.01	$ 41,803.41
10	$ 6,054.20	$ 27,777.40	$ 83,954.27	$ 72,172.22	$ 72,172.22	$ 6,411.66	$ 3,914.32	$ 16,962.05	$ 43,057.52
11	$ 6,235.82	$ 28,610.73	$ 86,472.89	$ 74,337.39	$ 74,337.39	$ 6,604.01	$ 4,031.75	$ 17,470.91	$ 44,349.24
12	$ 6,422.90	$ 29,469.05	$ 89,067.08	$ 76,567.51	$ 76,567.51	$ 6,802.13	$ 4,152.70	$ 17,995.04	$ 45,679.72
13	$ 6,615.58	$ 30,353.12	$ 91,739.09	$ 78,864.54	$ 78,864.54	$ 7,006.19	$ 4,277.28	$ 18,534.89	$ 47,050.11
14	$ 6,814.05	$ 31,263.71	$ 94,491.27	$ 81,230.47	$ 81,230.47	$ 7,216.37	$ 4,405.60	$ 19,090.94	$ 48,461.61
15	$ 7,018.47	$ 32,201.62	$ 97,326.00	$ 83,667.39	$ 83,667.39	$ 7,432.87	$ 4,537.77	$ 19,663.67	$ 49,915.46
16	$ 7,229.03	$ 33,167.67	$ 100,245.78	$ 86,177.41	$ 86,177.41	$ 7,655.85	$ 4,673.90	$ 20,253.58	$ 51,412.92
17	$ 7,445.90	$ 34,162.70	$ 103,253.16	$ 88,762.73	$ 88,762.73	$ 7,885.53	$ 4,814.12	$ 20,861.18	$ 52,955.31
18	$ 7,669.27	$ 35,187.58	$ 106,350.75	$ 91,425.61	$ 91,425.61	$ 8,122.09	$ 4,958.54	$ 21,487.02	$ 54,543.97
19	$ 7,899.35	$ 36,243.21	$ 109,541.27	$ 94,168.38	$ 94,168.38	$ 8,365.76	$ 5,107.30	$ 22,131.63	$ 56,180.29
20	$ 8,136.33	$ 37,330.51	$ 112,827.51	$ 96,993.43	$ 96,993.43	$ 8,616.73	$ 5,260.52	$ 22,795.58	$ 57,865.70

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Twin Ridge Options 1-3 Net Present Analysis

NPV Discount Rate 5 %
0.05

Option 1 - 100% Purchased Water with No Booster Pumps

		Year																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (4,640.04)	$ (4,779.24)	$ (4,922.62)	$ (5,070.29)	$ (5,222.40)	$ (5,379.08)	$ (5,540.45)	$ (5,706.66)	$ (5,877.86)	$ (6,054.20)	$ (6,235.82)	$ (6,422.90)	$ (6,615.58)	$ (6,814.05)	$ (7,018.47)	$ (7,229.03)	$ (7,445.90)	$ (7,669.27)	$ (7,899.35)	$ (8,136.33)	($74,077.19)
Repair and Replacement Costs		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (5,260.52)	($1,982.63)
Purchased Water Costs		$ (55,314.00)	$ (56,973.42)	$ (58,682.62)	$ (60,443.10)	$ (62,256.39)	$ (64,124.09)	$ (66,047.81)	$ (68,029.24)	$ (70,070.12)	$ (72,172.22)	$ (74,337.39)	$ (76,567.51)	$ (78,864.54)	$ (81,230.47)	$ (83,667.39)	$ (86,177.41)	$ (88,762.73)	$ (91,425.61)	$ (94,168.38)	$ (96,993.43)	($883,076.04)
P&I Payment		($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($16,753.50)	($208,785.62)
																					Total NPV=	($1,167,921.48)

Option 2 - 100% Purchased Water with Booster Pumps

		Year																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (21,289.07)	$ (21,927.74)	$ (22,585.57)	$ (23,263.14)	$ (23,961.03)	$ (24,679.86)	$ (25,420.26)	$ (26,182.87)	$ (26,968.35)	$ (27,777.40)	$ (28,610.73)	$ (29,469.05)	$ (30,353.12)	$ (31,263.71)	$ (32,201.62)	$ (33,167.67)	$ (34,162.70)	$ (35,187.58)	$ (36,243.21)	$ (37,330.51)	($339,875.35)
Repair and Replacement Costs	**$200 for approximate annual pump maintenance**	$ (200.00)	$ (206.00)	$ (212.18)	$ (218.55)	$ (225.10)	$ (231.85)	$ (238.81)	$ (245.97)	$ (253.35)	$ (260.95)	$ (268.78)	$ (276.85)	$ (285.15)	$ (293.71)	$ (302.52)	$ (311.59)	$ (320.94)	$ (330.57)	$ (340.49)	$ (22,795.58)	($11,652.19)
Purchased Water Costs		$ (55,314.00)	$ (56,973.42)	$ (58,682.62)	$ (60,443.10)	$ (62,256.39)	$ (64,124.09)	$ (66,047.81)	$ (68,029.24)	$ (70,070.12)	$ (72,172.22)	$ (74,337.39)	$ (76,567.51)	$ (78,864.54)	$ (81,230.47)	$ (83,667.39)	$ (86,177.41)	$ (88,762.73)	$ (91,425.61)	$ (94,168.38)	$ (96,993.43)	($883,076.04)
P&I Payment		($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($20,461.66)	($254,997.50)
																					Total NPV=	($1,489,601.09)

Option 3 - Supplemental Source (Demolish and Rebuild Station)

		Year																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (64,343.95)	$ (66,274.27)	$ (68,262.50)	$ (70,310.38)	$ (72,419.69)	$ (74,592.28)	$ (76,830.05)	$ (79,134.95)	$ (81,509.00)	$ (83,954.27)	$ (86,472.89)	$ (89,067.08)	$ (91,739.09)	$ (94,491.27)	$ (97,326.00)	$ (100,245.78)	$ (103,253.16)	$ (106,350.75)	$ (109,541.27)	$ (112,827.51)	($1,027,237.30)
Repair and Replacement Costs	**$500 for approximate annual pump main. & media**	$ (500.00)	$ (515.00)	$ (530.45)	$ (546.36)	$ (562.75)	$ (579.64)	$ (597.03)	$ (614.94)	$ (633.39)	$ (652.39)	$ (671.96)	$ (692.12)	$ (712.88)	$ (734.27)	$ (756.29)	$ (778.98)	$ (802.35)	$ (826.42)	$ (851.22)	$ (57,865.70)	($29,460.93)
Purchased Water Costs		$ (4,914.00)	$ (5,061.42)	$ (5,213.26)	$ (5,369.66)	$ (5,530.75)	$ (5,696.67)	$ (5,867.57)	$ (6,043.60)	$ (6,224.91)	$ (6,411.66)	$ (6,604.01)	$ (6,802.13)	$ (7,006.19)	$ (7,216.37)	$ (7,432.87)	$ (7,655.85)	$ (7,885.53)	$ (8,122.09)	$ (8,365.76)	$ (8,616.73)	($78,450.95)
P&I Payment		($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($83,755.02)	($1,043,772.70)
																					Total NPV=	($2,178,921.87)

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Sweet Hill
Address: Connection will be made at the intersection of Partridge Lane and Sweet Hill Rd

Notes:
Max HGL: 337, Min HGL: 302, Future HGL: 286
Max Pressure: 72.7 psi, Min Pressure: 57.6 psi, Future Pressure: 51 psi
Booster Station Elevation is at 169 ft
Approx. 910 ft of 4" if we stay in the shoulder
PVC Pipe
SRF PROJECT

Second highest customer is at 173 ft in elevation.

**need to pay a meter charge for either a 1-1/2" or 2" master meter (100gpm max vs. 160 gpm max)

Porperty Tax Rates:
Plaistow: $21.31/$1000
State: $6.6/$1000

Current Electrical Costs (2019 Total)			
	Kilowatts		25119
acct # 2031	Delivery Service	$	2,270.28
acct # 7591	Supplier Service	$	2,122.92
	Total:	$	4,393.20

Current PWW Sweet Hill Revenue Requirements		
Property Tax Expense	$	18,766.59
Electric Expense	$	4,393.20
Labor Expense	$	9,309.70
Chemical Costs		
Total Current PWW Expenses		

Current Labor Costs		
Kilowatts SH		25119
Kilowatts TR		66888
% SH/TR		0.375538213
Wages TR	$	24,790.28
Estimated Wages SH	$	9,309.70

Labor Cost is estimated based on electrical usage

Estimated Current Labor Cost		
TR Labor Cost	$	24,790.28
SH 50% Reduced Cost	$	12,395.14

Current Chemical Costs			
Assumed:	$	200.00	Waiting for information

Current Property Taxes			
Assest Value	$	360,537.26	
Land Tax Payment	$	8,704.00	2020 Tax Bill
Local Tax	$	7,683.05	Local tax is $21.31/$1000
State Tax	$	2,379.55	State tax is $6.6/$1000
Total:	$	18,766.59	

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Sweet Hill - Option 1 - 100% Purchased with Boosters

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00
11	Well Decommissioning	VF	1550	$ 11.00	$ 17,050.00
				Construction Total:	$ 323,700.00
				Construction Contingency:	$ 38,844.00
				Engineering/Planning:	$ 12,000.00
				MSDC Fee (1.5" Meter):	$ 8,973.00
				Plaistow Connection Fee (1.5" Meter):	$ 3,200.00
				Total Project Cost:	$ 386,717.00

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 9,977.66	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 8,704.00	
3	Labor	$ 6,197.57	Assumed 25% of Twin Ridge Annual Labor Costs
5	Electric Costs	$ 4,393.20	2019 Total
	Total:	$ 24,879.23	

Purchased Water Costs:

Item No.	Item	Rate	Quantity
1	Master Meter Flow	gal/year	3555000
2	Annual Meter Charge (1.5" Meter)	$283.50/quarter	$ 1,134.00
3	Annual Consumption Charge	$7/1000 gal	$ 24,885.00
		Annual Total:	$ 26,019.00

Summer Usage Assumptions

Number of Summer Usage Months:	5	months
Average GPD without outside usage:	150	gpd per household
Average GPD with outside usage:	1000	gpd per household
Number of Customers:	30	
Odd/Even Watering:	15	Customers watering per day
Summer Usage per Day:	17250	gpd
Summer Usage per Month:	517500	gal per month, assumed 30 days per month
Total Summer Usage:	2587500	gal
Total Non-Summer Usage:	967500	gal, assumed 30 days per month in summer months
Total Annual Usage:	3555000	gal/year

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Sweet Hill - Option 2 - Supplemental Source

Construction Costs:

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	CoA
1	Mobilization	LS	1	$ 15,000.00	$ 15,000.00	309
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00	$ 5,000.00	309
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00	$ 96,000.00	309
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	$ 1,400.00	309
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 3,000.00	309
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 3,000.00	309
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 500.00	309
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 8,750.00	309
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 144,000.00	309
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 30,000.00	311
11	New Treatment System	LS	1	$ 50,000.00	$ 50,000.00	320
				Construction Total:	$ 356,650.00	
				Construction Contingency:	$ 42,798.00	309
				Engineering/Planning:	$ 12,000.00	309
				MSDC Fee (3/4" Meter):	$ 2,324.00	306 or 309
				Plaistow Connection Fee (3/4" Meter):	$ 1,300.00	306 or 309
				Total Project Cost:	$ 415,072.00	

Operations and Maintenance Costs:

Item No.	Item	Cost	Comments
1	Annual Property Taxes on Interconnection (Local and State)	$ 11,483.51	Local Property Tax is $21.31/$1000, State Tax is $6.6/$1000
2	Annual Land Tax from 2020 Tax Bill	$ 8,704.00	
3	Labor	$ 12,395.14	Assumed 50% of Twin Ridge Annual Labor Costs
4	Chemical Costs	$ 200.00	
5	Electric Costs	$ 4,393.20	2019 Total
	Total:	$ 32,782.65	

Purchased Water Costs:

Item No.	Item	Rate	Quantity
1	Master Meter Flow	gal/year	2666250
2	Annual Meter Charge (3/4" Meter)	$63/quarter	$ 252.00
3	Annual Consumption Charge	$7/1000 gal	$ 18,663.75
		Annual Total:	$ 18,915.75

Summer Usage Assumptions

Number of Summer Usage Months:	5	months
Average GPD without outside usage:	150	gpd per household
Average GPD with outside usage:	1000	gpd per household
Number of Customers:	30	
Odd/Even Watering:	15	Customers watering per day
Summer Usage per Day:	17250	gpd
Summer Usage per Month:	517500	gal per month, assumed 30 days per month
Total Summer Usage:	2587500	gal
Total Non-Summer Usage:	967500	gal, assumed 30 days per month in summer months
Total Annual Usage:	3555000	gal/year
Amount of Purchased Water:	2666250	gal/year, assumed 75% purchased water
Amount of PEU Water:	888750	gal/year

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Sweet Hill Options 1 and 2 Net Present Value Analysis for PEU Expenses

Option 1: 100% Purchased Water with Booster Pumps

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 15,000.00		
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00		
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00		
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	Cost Extension	Repair/Replacement 2022 Cost
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 15,000.00	
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 5,000.00	
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 96,000.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 1,400.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 3,000.00	
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 3,000.00	
11	Well Decommissioning	VF	1550	$ 11.00	$ 500.00	
				Estimated Capital Cost:	$ 8,750.00	
					$ 144,000.00	
					$ 30,000.00	$ 15,000.00
					$ 17,050.00	
					$ 323,700.00	$ 15,000.00

Option 2: Supplemental Source

Item No.	Item	Unit	Quantity	Unit Price	Cost Extension	Repair/Replacement 2022 Cost
1	Mobilization	LS	1	$ 15,000.00		
2	Furnish & Install 12x4 MJ tap and sleeve	LS	1	$ 5,000.00		
3	Furnish and install 4" diameter C-900 water main	LF	1600	$ 60.00		
4	Furnish and install 4" ductile iron, mechanical joint bend w/ retainer glands & thrust block	EA	4	$ 350.00	Cost Extension	Repair/Replacement 2022 Cost
5	Furnish and install 4" diameter MJ gate valves	EA	3	$ 1,000.00	$ 15,000.00	
6	2" Air Release Assembly	EA	2	$ 1,500.00	$ 5,000.00	
7	Furnish and install 4" ductile iron, solid sleeve couplings and accessories	EA	1	$ 500.00	$ 96,000.00	
8	Trench Rock/Boulder Excavation and Dispsal	CY	50	$ 175.00	$ 1,400.00	
9	Complete Road Reconstruction (gravels, asphalt, misc.)	LF	1600	$ 90.00	$ 3,000.00	
10	Station Upgrades (incuding boosters)	LS	1	$ 30,000.00	$ 3,000.00	
11	New Treatment System	LS	1	$ 50,000.00	$ 500.00	
				Estimated Capital Cost:	$ 8,750.00	
					$ 144,000.00	
					$ 30,000.00	
					$ 50,000.00	$ 10,000.00
					$ 356,650.00	$ 10,000.00

Inflation Value: 3%

	Option 1		Option 2				Option 1	Option 2
					Term (yrs)	20	$ 386,717.00	$ 415,072.00
					Interest Rate:	2.500%		
$	240,000.00	$	240,000.00	SRF	P&I		($15,395.31)	($15,395.31)
$	136,717.00	$	175,072.00	Bond	P&I		($10,970.53)	($14,048.23)
							($26,365.84)	($29,443.54)

5% Bond Int Rate

	Operation and Maintenance Costs		Purchased Water Costs		Repair/Replacement		Station Rebuild Costs	
Year	Option 1	Option 2	Option 1	Option 2	Option 1	Option 2	Option 1	Option 2
1	$ 24,879.23	$ 32,782.65	$ 26,019.00	$ 18,915.75	$ 15,000.00	$ 10,000.00	$ 200,000.00	$ 260,000.00
2	$ 25,625.60	$ 33,766.13	$ 26,799.57	$ 19,483.22	$ 15,450.00	$ 10,300.00	$ 206,000.00	$ 267,800.00
3	$ 26,394.37	$ 34,779.12	$ 27,603.56	$ 20,067.72	$ 15,913.50	$ 10,609.00	$ 212,180.00	$ 275,834.00
4	$ 27,186.20	$ 35,822.49	$ 28,431.66	$ 20,669.75	$ 16,390.91	$ 10,927.27	$ 218,545.40	$ 284,109.02
5	$ 28,001.79	$ 36,897.17	$ 29,284.61	$ 21,289.84	$ 16,882.63	$ 11,255.09	$ 225,101.76	$ 292,632.29
6	$ 28,841.84	$ 38,004.08	$ 30,163.15	$ 21,928.54	$ 17,389.11	$ 11,592.74	$ 231,854.81	$ 301,411.26
7	$ 29,707.10	$ 39,144.20	$ 31,068.05	$ 22,586.39	$ 17,910.78	$ 11,940.52	$ 238,810.46	$ 310,453.60
8	$ 30,598.31	$ 40,318.53	$ 32,000.09	$ 23,263.99	$ 18,448.11	$ 12,298.74	$ 245,974.77	$ 319,767.21
9	$ 31,516.26	$ 41,528.08	$ 32,960.09	$ 23,961.91	$ 19,001.55	$ 12,667.70	$ 253,354.02	$ 329,360.22
10	$ 32,461.75	$ 42,773.93	$ 33,948.89	$ 24,680.76	$ 19,571.60	$ 13,047.73	$ 260,954.64	$ 339,241.03
11	$ 33,435.60	$ 44,057.15	$ 34,967.36	$ 25,421.19	$ 20,158.75	$ 13,439.16	$ 268,783.28	$ 349,418.26
12	$ 34,438.67	$ 45,378.86	$ 36,016.38	$ 26,183.82	$ 20,763.51	$ 13,842.34	$ 276,846.77	$ 359,900.81
13	$ 35,471.83	$ 46,740.23	$ 37,096.87	$ 26,969.34	$ 21,386.41	$ 14,257.61	$ 285,152.18	$ 370,697.83
14	$ 36,535.98	$ 48,142.43	$ 38,209.78	$ 27,778.42	$ 22,028.01	$ 14,685.34	$ 293,706.74	$ 381,818.77
15	$ 37,632.06	$ 49,586.71	$ 39,356.07	$ 28,611.77	$ 22,688.85	$ 15,125.90	$ 302,517.94	$ 393,273.33
16	$ 38,761.03	$ 51,074.31	$ 40,536.75	$ 29,470.12	$ 23,369.51	$ 15,579.67	$ 311,593.48	$ 405,071.53
17	$ 39,923.86	$ 52,606.54	$ 41,752.86	$ 30,354.23	$ 24,070.60	$ 16,047.06	$ 320,941.29	$ 417,223.67
18	$ 41,121.57	$ 54,184.73	$ 43,005.44	$ 31,264.85	$ 24,792.71	$ 16,528.48	$ 330,569.53	$ 429,740.38
19	$ 42,355.22	$ 55,810.27	$ 44,295.61	$ 32,202.80	$ 25,536.50	$ 17,024.33	$ 340,486.61	$ 442,632.60
20	$ 43,625.88	$ 57,484.58	$ 45,624.47	$ 33,168.88	$ 26,302.59	$ 17,535.06	$ 350,701.21	$ 455,911.57

Station Rebuild Costs

Option 2 Station Rebuild:			
Station Rebuild 2022 Cost	$ 260,000.00		
Station Built in 1996			
Replace at year 40 or 2036			
Analysis year 2036-2022=14	$ 381,818.77	Int=	0.05
P&I at 5% interest	($30,638.13)		
Option 1 Station Rebuild:			
New Station no Tank 2022 cost	$ 200,000.00	Int=	0.05
14 Year Rebuild	$ 293,706.74		
P&I at 5% Interest	($23,567.79)		

Pennichuck Water Works, Inc.
Twin Ridge and Sweet Hill Net Present Value Analysis
2.50% Rate

Sweet Hill Options 1 & 2 Net Present Value Analysis

NPV Discount Rate 5 %
0.05

Option 1 - 100% Purchased Water with Booster Pumps

		Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (24,879.23)	$ (25,625.60)	$ (26,394.37)	$ (27,186.20)	$ (28,001.79)	$ (28,841.84)	$ (29,707.10)	$ (30,598.31)	$ (31,516.26)	$ (32,461.75)	$ (33,435.60)	$ (34,438.67)	$ (35,471.83)	$ (36,535.98)	$ (37,632.06)	$ (38,761.03)	$ (39,923.86)	$ (41,121.57)	$ (42,355.22)	$ (43,625.88)	($397,191.48)
Repair and Replacement Costs	**$200 for approximate annual pump maintenance**	$ (200.00)	$ (206.00)	$ (212.18)	$ (218.55)	$ (225.10)	$ (231.85)	$ (238.81)	$ (245.97)	$ (253.35)	$ (260.95)	$ (268.78)	$ (276.85)	$ (285.15)	$ (293.71)	$ (302.52)	$ (311.59)	$ (320.94)	$ (330.57)	$ (340.49)	$ (26,302.59)	($12,973.95)
Purchased Water Costs		$ (26,019.00)	$ (26,799.57)	$ (27,603.56)	$ (28,431.66)	$ (29,284.61)	$ (30,163.15)	$ (31,068.05)	$ (32,000.09)	$ (32,960.09)	$ (33,948.89)	$ (34,967.36)	$ (36,016.38)	$ (37,096.87)	$ (38,209.78)	$ (39,356.07)	$ (40,536.75)	$ (41,752.86)	$ (43,005.44)	$ (44,295.61)	$ (45,624.47)	($415,387.70)
P&I Payment		($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($26,365.84)	($49,933.63)	($49,933.63)	($49,933.63)	($49,933.63)	($49,933.63)	($49,933.63)	($49,933.63)	($400,897.60)
																					Total Net Present Value:	($1,226,450.74)

Option 2 - Supplemental Source

		Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Net Present Value
Operations and Maintenance Costs		$ (32,782.65)	$ (33,766.13)	$ (34,779.12)	$ (35,822.49)	$ (36,897.17)	$ (38,004.08)	$ (39,144.20)	$ (40,318.53)	$ (41,528.08)	$ (42,773.93)	$ (44,057.15)	$ (45,378.86)	$ (46,740.23)	$ (48,142.43)	$ (49,586.71)	$ (51,074.31)	$ (52,606.54)	$ (54,184.73)	$ (55,810.27)	$ (57,484.58)	($523,367.97)
Repair and Replacement Costs	**$400 for approximate annual pump main. & media**	$ (400.00)	$ (412.00)	$ (424.36)	$ (437.09)	$ (450.20)	$ (463.71)	$ (477.62)	$ (491.95)	$ (506.71)	$ (521.91)	$ (537.57)	$ (553.69)	$ (570.30)	$ (587.41)	$ (605.04)	$ (623.19)	$ (641.88)	$ (661.14)	$ (680.97)	$ (17,535.06)	($12,730.34)
Purchased Water Costs		$ (18,915.75)	$ (19,483.22)	$ (20,067.72)	$ (20,669.75)	$ (21,289.84)	$ (21,928.54)	$ (22,586.39)	$ (23,263.99)	$ (23,961.91)	$ (24,680.76)	$ (25,421.19)	$ (26,183.82)	$ (26,969.34)	$ (27,778.42)	$ (28,611.77)	$ (29,470.12)	$ (30,354.23)	$ (31,264.85)	$ (32,202.80)	$ (33,168.88)	($301,985.85)
P&I Payment		($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($29,443.54)	($60,081.67)	($60,081.67)	($60,081.67)	($60,081.67)	($60,081.67)	($60,081.67)	($60,081.67)	($460,948.90)
																					Total Net Present Value:	($1,299,033.07)

Replacement year
Need to add water main P&I to Station rebuild P&I