

DW-SRF 2010 Project

Proposal for Green Project Reserve Methodology using format from EPA's • June 22, 2009 guidance for GPR business cases

ESTIMATE OF VALUE OF WATER LOSS WORKSHEET

1 Date:	6-Apr-10
2 PWSID #	90660
3 System	HAMPDEN WATER DISTRICT
4 Project Name	Main Replacement Project
5 Location	Route 1A
6 Engineering Consultant	Woodard & Curran
7 Existing Main size, age, and type	6" cast iron unlined pipe
8 Proposed New Water Main size and type	12" Ductile Iron cement lined pipe
9 New Main Pipe Length	2,800
10 Estimated Project Cost	\$ 721,650

Note: Data from Utilities Annual Report (2008) to Maine Public Utilities Commission

<u>Page</u>	<u>Line</u>	<u>Description</u>	<u>Units</u>	<u>2008</u>
W-12	15	Total Production Water	gallons per year	101,938,000
W-12	17	Total Revenue Water	gallons per year	89,138,000
W-12	19	Total Non-Revenue Water	gallons per year	12,800,000
W-12	19	Percent Non-Revenue Water		13%
W-12	22	Utility Usage - treatment	gallons per year	-
W-12	23	Utility Usage - hydrant flushing	gallons per year	1,682,000
W-12	14	Utility Usage - bleeders	gallons per year	110,000
W-12	26	Utility Usage - all other (running customers & blow-offs)	gallons per year	130,000
W-12	30	Fire Protection	gallons per year	20,000
W-12	31	Main Breaks	gallons per year	753,000
W-12	35	Flushing Mains	gallons per year	
W-12	36	Total Accounted for Non-Revenue Water	gallons per year	2,695,000
W-12	37	Total Unaccounted Non-Revenue Water	gallons per year	10,105,000
		Estimated Water Loss From ALL Breaks, Leaks, & Bleeders	gallons per year	11,098,000
		<i>(PUC Accounts total of lines 14, 26,31,35 and 37)</i>		
		% of Water Loss of Total Production Water		11%
		<i>(PUC Lines 14,26,31,35,37 divided by Line 15)</i>		
W-9	9	Total Transmission Mains	feet	-
W-9	23	Total Distribution Mains	feet	186,130
		Total Mains in Service	feet	186,130
			miles	35
		<u>Estimated Distribution System Losses:</u>		
		Loss Water per mile of pipe	gallons per mile per year	314,820
		Loss Water per foot of pipe per year	gallons per foot per year	60
		Loss water per foot of pipe per day	gallons per foot per day	0.16
		<u>Water loss will vary with age of water main - assume Straight line projection as follows:</u>		
		0 to 25 year old pipe	0 % of Total Loss	gallons per mile per year
		26 to 50 year old pipe	10% of Total Loss	gallons per mile per year
		51 to 75 year old pipe	30% of Total Loss	gallons per mile per year
		over 75 year old pipe	60% of Total Loss	gallons per mile per year
				188,892
			All Losses:	314,820
		Age of Main to be replaced	years	100
		Length of Main to be Replaced	mile	0.53
		CALCULATED WATER LOSS - FOR PROPOSED PROJECT	gallons per year	100,170
W-2	29c	Total PRODUCTION COST of Water	\$/year	\$ 789,785
W-12	15	Total Production Water	1,000 gallons per year	101,938
		Production Cost of Water	per 1,000 gallons	\$ 7.75
		PROJECTED ANNUAL VALUE of WATER LOSS	per year	\$ 776

Annual Savings	\$	776
PV Factor (uniform series present worth factor (1%, 75 years):	\$	52.587
Present Value of Savings over Economic life of pipeline:	\$	40,812
Project Cost	\$	721,650
PV Percent of Project Cost:		6%

ESTIMATED % Green	6%
\$ Amount Green	\$ 40,812



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Control and Prevention
An Office of the
Department of Health and Human Services

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State of Maine Drinking Water Program
GREEN PROJECT RESERVE
BUSINESS CASE for a
WATER MAIN REPLACEMENT

ESTIMATE OF VALUE OF WATER LOSS

April 13, 2010

The Fiscal Year (FY) 2010 Appropriation Law (P.L. 111-88) included additional requirements affecting the Drinking Water State Revolving Fund (SRF) program. EPA has developed *Draft Procedures for Implementing Certain Provisions of EPA's Fiscal Year 2010 Appropriation Affecting the Clean Water and Drinking Water State Revolving Fund Programs* dated March 3, 2010. Public Law 111-88 included the language "Provided, that for fiscal year 2010, to the extent there are sufficient eligible project applications, not less than 20% of the funds made available under this title to each State for the Clean Water and Drinking Water State Revolving funds and not less than 20% of the funds made available under this title to each State for Drinking Water State Revolving Fund capitalization grants shall be used by the State for projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities."

One of the project area identified in the EPA Green Project Guidance Documents is identified as Water Efficiency Improvements "*distribution pipe replacement or rehabilitation to reduce water loss and prevent water main breaks*". A Business Case Analysis if required for a water main replacement project to be approved as providing "Water Efficiency Improvements".

The purpose of this document is to provide public water utilities regulated by the Maine Public Utilities Commission (MPUC) with a standard procedure for calculating an estimate of the value of the water losses saved in conjunction with a water main replacement project. This method does not preclude a utility from providing an alternative calculation methodology based on project specific information. Such alternative documentation shall be reviewed and may be approved by the MDWP.

The Maine Public Utilities Commission (MPUC) requires all Maine water utilities file an Annual Report with the Commission. The Annual Report is the source of much information useful for preparing an estimate of value of water loss for a Business Case analysis of Green Project Reserve.

The attached methodology utilizes specific data from a utility's Annual Report to the MPUC. Page W-12 provides a detailed analysis of utilities water production and consumption information. Specific details include Production Water (line 15), Revenue Water (Line 17), as well as estimated water losses from bleeders, blow-offs, main breaks, service leaks, and main flushing.

Page W-9 of the PUC Annual Report provides information on total transmission and distribution mains in service as well as annual additions and deletions.

With information on Page W-12, one can calculate total water losses from all breaks, leaks, and bleeders. From Page W-9, one can identify the total length of mains in service. With these two pieces of information, one can calculate the estimated water loss in gallons per foot of pipe per day.

Knowing that older water mains and services will typically be the source of more leaks, or water losses, a ratio to distribute water losses by the age of mains. Pipes 0 to 25 years old are not expected to leak therefore no water loss is attributed to pipes less than 25 years old. Pipes 26 to 50 years old will account for 10% of all water losses. Pipes 51 to 75 years old will account for 30% of water losses and pipes older than 75 years will represent 60% of all pipeline water losses.

Using the average water loss per foot and the specific pipeline proposed for replacement, one can allocate water losses associated with the proposed project.

Using the water production cost information found on Page W-2, one can calculate the Annual Projected Value of Water Loss associated with the proposed project.

The MPUC allows depreciation of water distribution mains over a 75 year period. Using the MPUC time period (which should be the absolute minimum that a new water main will remain in service, or economic life) a Present Value (PV) calculation can be made of the an Annuity (Annual Value) of Water Loss using a 1% value of money over 75 years.

MPUC defines "Service Life" as the average length of time a unit of equipment will remain in service taking into account factors such as the effect of normal wear and tear, economic and technological obsolescence and public requirements.

The resulting PV can be compared with the Project Cost Estimate to determine the % of project expense attributed to the value of reduced water loss.

ANNUAL REPORT

For Water Utilities

OF

Name

HAMPDEN WATER DISTRICT

Address

PO BOX 218
HAMPDEN ME, 04444-0218

TO THE
PUBLIC UTILITIES COMMISSION

OF THE
STATE OF MAINE

FOR THE
YEAR ENDED DECEMBER 31, 2008

Signature of Person
responsible for report

TITLE _____

TELEPHONE _____

WATER UTILITY PLANT ACCOUNTS

Line Number	ACCT.	ACCOUNT NAME	CURRENT YEAR	.1	.2
	NO.			Source of Supply & Pumping Expenses-Operations	Source of Supply & Pumping Expenses-Maintenance
	(a)	(b)	(c)	(d)	(e)
1	601	Salaries and Wages - Employees	209,067	7,337	
2	603	Salaries and Wages - Officers, Directors and Majority Stockholders			
3			600		
4	604	Employee Pensions and Benefits	151,287		
5	610	Purchased Water	206,655	206,655	
6	615	Purchased Power	14,482	4,809	
7	616	Fuel for Power Purchased	0		
8	618	Chemicals	3,712		0
9	620	Materials and Supplies	63,739	5,162	198
10	631	Contractual Services - Engineering	2,257		
11	632	Contractual Services - Accounting	6,000		
12	633	Contractual Services - Legal	6,106		
13	634	Contractual Services - Management Fees	0		
14	635	Contractual Services - Other	19,709		
15	641	Rental of Building/Real Property	0		
16	642	Rental of Equipment	656		
17	650	Transportation Expenses	16,546		
18	656	Insurance - Vehicle	6,879		
19	657	Insurance - General Liability	4,531		
20	658	Insurance - Workman's Compensation	6,623		
21	659	Insurance - Other	0		
22	660	Advertising Expense	4,049		
23	666	Regulatory Commission Expenses -	16,366		
24		Normalization of Rate Case Expense			
25	667	Regulatory Commission Expenses - Other	0		
26	670	Bad Debt Expense	21		
27	675	Miscellaneous Expenses	50,500	731	
28					
29		Total Water Utility Expenses	789,785	224,694	198

WATER TREATMENT

FOR EACH SUPPLY, CHECK AND/OR SPECIFY THE TYPE OF TREATMENT USED

Line Number	Name of Source	Chlorination	Fluoridation	Flocculation/Coagulation	Sedimentation	Filtration	Iron/Manganese Removal	Lead/Copper	Other Treatment (specify)
1	Pump Station #1								
2	Pump Station #2								
3	Kennebec Road Rechlor	X							
4									
5									
6									
7									
8									
9									
10									
11									
12									

FEET OF TRANSMISSION AND DISTRIBUTION MAINS

Explain any important items included in column (f)

Line Number	Kind of Pipe (Galvanized, Cast Iron, Ductile, etc) (a)	Diameter in inches (b)	In Use First of Year (c)	Added During Year (d)	Retirements during Yr (e)	Adjustments Dr. (or Cr.) during Yr (f)	In Use End of Year (g)
1	Transmission						
2							
3							
4							
5							
6							
7							
8							
9	Total Transmission		0	0	0	0	0
10	Distribution						
11	CIP-DI	6	45,167				45,167
12	CIP-DI	8	82,405				82,405
13	CIP-DI	12	36,316				36,316
14	CIP	10	9,412				9,412
15	CIP	2	2,408				2,408
16	CIP	1.5	950				950
17	WI	2	2,544				2,544
18	Copper	1.5	1,150				1,150
19	Copper	1	673				673
20	PE	2	2,060	45			2,105
21	PE	1.5	1,150				1,150
22	PE	1	1,850				1,850
23	Total Distribution		186,085	45	0		186,130

WATER PRODUCTION AND CONSUMPTION

I. Show quantities of water produced and purchased and the quantities delivered to consumers and lost or unaccounted for during the year. Where estimates are used, the basis thereof should be set forth in a footnote.

Line Number	Month (a)	Thousand Gallons Delivered to Mains				
		Purchased (b)	Groundwater		Surface Water	
			By Pumping (c)	By Gravity (d)	By Pumping (e)	By Gravity (f)
1	January	9,013				
2	February	8,963				
3	March	7,398				
4	April	7,724				
5	May	10,384				
6	June	7,868				
7	July	9,603				
8	August	8,398				
9	September	7,725				
10	October	8,823				
11	November	7,809				
12	December	8,230				
13	Totals	101,938	0	0	0	0
14						
15	Total PRODUCTION WATER					THOUSAND GALLONS
16						101,938
17	Total REVENUE WATER (Page W-3, line 20, col. e)					89138
18						
19	Balance as NON-REVENUE WATER		State Percentage:		12.56%	12800
20						
21	Description and estimated consumption of Non-Revenue Water					
22	Utility Usage-at source/treatment plants					
23	Utility Usage-flushing hydrants	Number flushed:	178		1682	
24	Utility Usage-bleeders	Number in use:	1		110	
25	Utility Usage-meter bench	Number meters tested:	147		130	
26	Utility Usage-other purposes (specify):		Sampling			
27						
28						
29						
30	Fire Protection	Number of hydrant-using fires:	1		20	
31	Main Breaks	Number of breaks:	3		753	
32	Service Line losses before meters	Number of cases:	1		367	
33	Other Non-Revenue uses/losses (specify):		Sample Meters		481	
34						
35						
36	Total Accounted for Non-Revenue Water (Lines 22 through Lines 35)					3543
37	Unaccounted for Water					9257
38	Total Non-Revenue Water (Lines 36 plus Line 37)					12800
39						
40	System DEMAND Data		Quantity (mgd)	Date		
41	Average Daily Demand:	0.27089				
42	Maximum Day Demand:	0.561748	2/14/2008			
43	Peak Hour Demand:					

Remarks Note: Non-revenue water is water that was produced and used but did not produce water revenues; unaccounted for water is a subset of this.