

# 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: 4-May-10  
 2 PWSID # 91330  
 3 System **RANGELEY WATER DISTRICT**  
 4 Project Name Main Replacement Project - Project # 201-30  
 5 Location Loon Lake Road  
 6 Engineering Consultant A.E.Hodsdon  
 7 Existing Main size, age, and type 6" cast iron unlined, eliminate dead ends  
 8 Proposed New Water Main size and type 8" Ductile Iron Cement Lined  
 9 New Main Pipe Length 2,300  
 10 Estimated Project Cost \$ 357,300

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

Page	Line	Description	Units	2008
W-12	15	Total Production Water	gallons per year	25,664,000
W-12	17	Total Revenue Water	gallons per year	
W-12	19	Total Non-Revenue Water	gallons per year	
W-12	19	Percent Non-Revenue Water		
W-12	22	Utility Usage - treatment	gallons per year	
W-12	23	Utility Usage - hydrant flushing	gallons per year	
W-12	14	Utility Usage - bleeders	gallons per year	
W-12	26	Utility Usage - all other (running customers & blow-offs)	gallons per year	
W-12	30	Fire Protection	gallons per year	
W-12	31	Main Breaks	gallons per year	
W-12	35	Flushing Mains	gallons per year	
W-12	36	Total Accounted for Non-Revenue Water	gallons per year	-
W-12	37	Total Unaccounted Non-Revenue Water	gallons per year	-
		<b>Estimated Water Loss From ALL Breaks, Leaks, &amp; Bleeders</b> (PUC Accounts total of lines 14, 26,31,35 and 37)	gallons per year	
		<b>% of Water Loss of Total Production Water</b> (PUC Lines 14,26,31,35,37 divided by Line 15)		0%
W-9	9	Total Transmission Mains	feet	
W-9	23	Total Distribution Mains	feet	
		Total Mains in Service	feet	96,720
			miles	18
		<u>Estimated Distribution System Losses:</u>		
		Loss Water per mile of pipe	gallons per mile per year	-
		Loss Water per foot of pipe per year	gallons per foot per year	-
		Loss water per foot of pipe per day	gallons per foot per day	-
		<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 -
			All Loses:	-
		Age of Main to be replaced	years	90
		Length of Main to be Replaced	mile	0.44
		<b>CALCULATED WATER LOSS - FOR PROJECT</b>	<b>gallons per year)</b>	<b>600,000</b>
		<i>Note: See estimate prepared by A.E. Hodsdon, P.E.</i>		
W-2	29c	<b>Total PRODUCTION COST of Water</b>	<b>\$/year</b>	
W-12	15	Total Production Water	1,000 gallons per year	
		<b>Production Cost of Water</b>	<b>per 1,000 gallons</b>	<b>\$ 1.16</b>
		<b>PROJECTED ANNUAL VALUE of WATER LOSS</b>	<b>per year</b>	<b>\$ 696</b>

Annual Savings	\$	696
PV Factor ( uniform series present worth factor (1%, 75 years):	\$	52.587
<b>Present Value of Savings over Economic life of pipeline:</b>	<b>\$</b>	<b>36,601</b>
<b>Project Cost</b>	<b>\$</b>	<b>357,300</b>
PV Percent of Project Cost:		10%
<b>ESTIMATED % Green</b>		<b>10%</b>
<b>\$ Amount Green</b>	<b>\$</b>	<b>36,601</b>



**Maine Center for Disease  
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.

**WATER EXPENSE ACCOUNT MATRIX**

Line Number	3 Water Treatment Expenses- Operations (f)	4 Water Treatment Expenses- Maintenance (g)	5 Transmission & Distribution Expenses-Operations (h)	6 Transmission & Distribution Expenses-Maintenance (i)	7 Customer Accounts Expense (j)	8 Administrative & General Expenses (k)
1	0	19		12,822	580	35,301
2						
3						
4						21,037
5						10,605
6						
7						55
8	4,929	610				
9	358		350	2,238	1,292	
10						1,742
11						-3,401
12						2,050
13						634
14						
15		500		9,413	8,641	9,977
16						84
17	1,829	736	1,786	86	1,308	256
18						
19						
20						3,594
21						3,489
22						21,995
23						674
24						
25						
26						2,048
27	919		93	245	1,920	5,708
28						
29	8,035	1,865	2,229	24,804	13,741	115,848

### WATER PRODUCTION AND CONSUMPTION

1. 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		2,644			
2	February		2,745			
3	March		2,901			
4	April		2,097			
5	May		1,769			
6	June		1,696			
7	July		2,399			
8	August		2,612			
9	September		1,708			
10	October		1,932			
11	November		1,564			
12	December		1,597			
13	Totals	0	25,664	0	0	
14						
15	<b>Total PRODUCTION WATER</b>					<b>THOUSAND GALLONS</b>
16						25,664
17	<b>Total REVENUE WATER</b> (Page W-3, line 20, col. e) or					0
18						
19	<b>Balance as NON-REVENUE WATER</b>				<b>State Percentage:</b>	60.00%
20						25,664
21	<b>Description and estimated consumption of Non-Revenue Water</b>					
22	Utility Usage-at source/treatment plants					
23	Utility Usage-flushing hydrants				Number flushed:	
24	Utility Usage-bleeders				Number in use:	
25	Utility Usage-meter bench				Number meters tested:	
26	Utility Usage-other purposes (specify):					
27						
28						
29						
30	<b>Fire Protection</b>				Number of hydrant-using fires:	
31	<b>Main Breaks</b>				Number of breaks:	
32	<b>Service Line losses before meters</b>				Number of cases:	
33	<b>Other Non-Revenue uses/losses (specify):</b>					
34						
35						
36	<b>Total Accounted for Non-Revenue Water</b> (Lines 22 through Lines 35)					0
37	<b>Unaccounted for Water</b>					
38	<b>Total Non-Revenue Water</b> (Lines 36 plus Line 37)					0
39						
40	<b>System DEMAND Data</b>		<b>Quantity (mgd)</b>	<b>Date</b>		
41	Average Daily Demand:					
42	Maximum Day Demand:					
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.

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18						
19	<b>Balance as NON-REVENUE WATER</b>		<b>State Percentage:</b> 60.00%		25664	
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30	Fire Protection	Number of hydrant-using fires:				
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36	<b>Total Accounted for Non-Revenue Water</b> (Lines 22 through Lines 35)					
37	Unaccounted for Water					
38	<b>Total Non-Revenue Water</b> (Lines 36 plus Line 37)					
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40	<b>System DEMAND Data</b>					
41	Average Daily Demand:	Quantity (mgd)	Date			
42	Maximum Day Demand:					
43	Peak Hour Demand:					

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