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WOODARD &CURRAN

January 25, 2019

Via Electronic Mail

Jed M. Nosal, Esquire
Brown Rudnick LLP
One Financial Center
Boston, MA 02111

RE: Milford Water Company Valuation; D.P.U. 18-60 – RCNLD Analysis

Dear Mr. Nosal:

This letter details the findings of Woodard & Curran relative to our assessments of various measures of Reproduction Cost New Less Depreciation (RCNLD") of the existing water treatment, storage, transmission, and distribution system (collectively, "water system") owned by the Milford Water Company (MWC). ("Report") Our analysis included the review of records, the physical inspection of accessible water system assets, and the completion of a depreciation analysis on water system assets, not including tangible property, real estate, nor improvements thereupon.

Our assessments were based upon a combination of standard industry practices and the professional judgment of staff with expertise in the design, construction, and operation of potable water systems. The goal of these analyses was to provide four measures of RCNLD for the water system owned by the MWC for use in the Milford Water Company Valuation Analysis provided in the Report of John J. Reed of Concentric Energy Advisors, Inc., TOWN-Exhibit-JJR-2. Our findings are presented below with a description of the process by which the assessment was completed is detailed later in this Report.

Summary of Findings

The tables below summarize our findings as to the RCN, RCNLD, Indexed RCN and Indexed RCNLD of the water system owned by MWC. Numbers were calculated for each using both the physical depreciation and the book depreciation approaches.

		RCNLD	
Horizontal Assets	RCN	Physical Dep.	Book Dep.
Distribution Pipes	$105,945,539	$36,991,669	$31,920,262
Transmission Pipes	$4,516,654	$701,814	$497,965
Valves	$3,174,349	$1,088,708	$366,599
Meters	$3,240,031	$1,573,048	$2,044,220
Hydrants	$2,655,850	$1,345,631	$303,770
Subtotal - Horizontal	$119,532,423	$41,700,870	$35,132,818
Vertical Assets			
Treatment Plants	$30,750,000	$19,525,253	$20,590,278
Pumping Facilities	$3,075,000	$582,083	$233,125
Tanks/Standpipes	$5,340,000	$1,697,333	$1,292,000
Subtotal - Vertical	$39,165,000	$21,804,669	$22,115,403
Total	$158,697,423	$63,505,539	$57,248,220

		Indexed RCNLD	
Horizontal Assets	Indexed RCN	Physical Dep.	Book Dep.
Distribution Pipes	$23,334,394	$12,590,297	$11,019,455
Transmission Pipes	$428,914	$68,183	$54,970
Valves	$796,648	$434,689	$232,521
Meters	$2,364,634	$1,428,991	$1,718,573
Hydrants	$792,445	$401,505	$153,910
Subtotal - Horizontal	$27,717,035	$14,923,665	$13,179,428
Vertical Assets			
Treatment Plants	$21,821,767	$16,694,769	$17,157,966
Pumping Facilities	$1,184,333	$487,289	$511,004
Tanks/Standpipes	$862,146	$395,694	$308,820
Subtotal - Vertical	$23,868,246	$17,577,752	$17,977,789
Total	$51,585,281	$32,501,417	$31,157,218

Definitions

To ensure that all parties understand the calculations documented in this Report, the following definitions describe the meaning of the following terms:

Depreciation

Depreciation is the practice by which organizations attempt to account for the deterioration over time in the condition and utility of a capitalized asset. While DPU-regulated utilities regularly include depreciation in their cost of service, as used for rate setting purposes, this practice is rare amongst publicly-owned utilities.

Physical Depreciation

Physical depreciation, as used in this Report, is the depreciation calculated using a straight-line depreciation from the year of installation based upon the expected useful life of the material or equipment.

Book Depreciation

Book Depreciation, as used in this Report, is made using a straight-line depreciation based upon the depreciable life values used by MWC in the rate base working papers (Town-MWC-1-18-A Attachment). In the case of assets which have multiple depreciation schedules in Town-MWC-1-18-A Attachment, the longer schedule was carried in the calculation of book RCNLD.

Reproduction Cost New (RCN)

Reproduction Cost New is the engineering estimate of the present cost of replacing an existing asset with a new asset of similar construction and operational utility. These estimates were prepared using the RS Means construction cost guidelines which is a standard cost estimation method in the construction industry. The RCN does not take into account depreciation which may have been applied to the asset by the owner and RCN is usually higher that the item's book value. The values carried for RCN in this Report are based upon the Report of James J. Rivard of Woodard & Curran which provides the full RCN of the MWC system.

Indexed RCN

Since very few of the assets in the water system have original cost values available in the records produced by MWC and reviewed, the Indexed RCN is intended as a corollary for the original cost of construction. These values were derived from information provided by MWC in discovery and were calculated through the combination of each assets' RCN with the ratio of the applicable Handy Whitman Construction Cost index in the assets' year of construction divided by the current Handy Whitman Construction Cost index.

Reproduction Cost New Less Depreciation (RCNLD)

Reproduction Cost New Less Depreciation is the RCN for an asset less the depreciated value of the asset to account for either physical or book depreciation. While MWC is currently a DPU-regulated utility, most municipal utilities depreciate their asset bases in compliance with Statement No. 34 from the Governmental Accounting Standards Board (GASB) which results in a significantly faster depreciation of most assets in comparison to the depreciation included in this Report.

Indexed RCNLD

Indexed RCNLD is the depreciated value of an asset where the beginning point for the depreciation was the Indexed RCN value rather than the RCN. This value is an attempt to quantify the remaining value of an asset based upon the original cost of construction, rather than the current RCN.

Expected Useful Life (EUL)

Expected Useful Life is an engineering estimate (in years) of how long a new asset of similar material and construction would be expected to remain in service from the time the asset was placed into service. These estimates are based upon a combination of industry guidelines and the experience of Woodard & Curran in the operation and maintenance of potable water infrastructure.

Handy Whitman Indices

Handy Whitman Indices are a data series which are based upon the change in the actual cost of construction on water infrastructure over time. There are different data series for many different types of water system infrastructure, but all of the series are based upon a relative construction cost of 100 in 1973.

Inventory of Buried/Inaccessible Assets

As part of discovery, Woodard & Curran was provided with documentation on the list of buried or otherwise inaccessible assets of the MWC which were to be included in our evaluation, as follows:

Distribution Mains

MWC provided a list of streets with had water mains, along with the size, material, and date of construction. Additionally, MWC provided a map booklet which provided the layout of the system. In many instances, important information on the water mains was either omitted or provided in general format (i.e. construction during a decade rather than a specific year). The versions used in our analysis were provided as discovery document TOWN-MWC-2-9 Attachment and TOWN-MWC-1-23-C.

Transmission Mains

A list was provided of the transmission mains indicating size, material, and linear footage provided as discovery document TOWN-MWC-2-9 Attachment and TOWN-MWC-1-23-C.

Valves

MWC provided a list of the valves within the system as discovery document Town-MWC-2-6-C Attachment. The file contains information on the size, material and date of installation.

Meters

MWC provided a list of the valves within the system as discovery document Town-MWC-2-6-B Attachment. The file contains information on the size, model, and purchase/installation date.

Hydrants

MWC provided a list of the valves within the system as discovery document Town-MWC-1-23-C Attachment. While the document provides the number of hydrants, it contains no information on installation date.

Calculation of Indexed RCN Values

As discussed in the definition, the Indexed RCN was calculated as a corollary for having original cost data available. The calculation of these values is a completing a straightforward ratio to the RCN as shown by the equation below:

*Indexed RCN = RCN * (Handy Whitman Index – year of construction) / (Handy Whitman Index – 2018)*

Since Handy Whitman Indices are available for a number of different types of water infrastructure, the index most closely matching each asset class was used.

Calculations of RCNLD (Physical Depreciation) and RCNLD (Book Depreciation)

Using the RCN analysis found in TOWN-JR-3, the RCLND was calculated using both physical and book depreciation in accordance with the general methods of depreciation practices, modifications and assumptions described below.

Calculations of Indexed RCNLD (Physical Depreciation) and RCNLD (Book Depreciation)

Using the RCN analysis found in TOWN-JR-3, the Indexed RCLND was calculated using both physical and book depreciation in accordance with the general methods of depreciation practices, modifications and assumptions described below.

General Methods of Depreciation practices

All of the depreciation calculations in our analyses were completed using a straight line depreciation from the date of install to the end of the assets expected life. Straight line depreciation is a generally accepted practice used by publicly-owned utilities to account for the depreciation of their assets under GASB Statement 34. For the calculation of physical depreciation and book depreciation, the engineering EUL and the book depreciation life (BDL) were used, respectively.

As the date of installation of assets has a large impact on the calculation of the depreciated values, and the installation information provided by MWC was incomplete, the assumptions detailed below are important to review to understand how the calculations were made.

Additionally, as the construction materials of various buried assets can have a significant impact on the EUL of the asset, it is important to understand the modification made to the incomplete data provided by MWC. These modifications are also detailed later in this Report.

Modifications to MWC Provided Data in the Depreciation Analysis

Inspected Assets

In the depreciation analysis, the Clark's Island Well Field and Dilla Street Treatment Plant both had their actual construction costs carried in the Indexed RCN column to reflect the costs carried in MWC's depreciation tables provided as part of Town-MWC-1-18-B Attachment. No RCN of the Echo Lake Reservoir Dam was provided in TOWN-JJR-3. However, according to TOWN-MWC-3-4 Attachment "The original dam was reportedly constructed in 1881 of locally quarried stone." Therefore, for purposes of the RCNLD analysis, the dam was considered to be fully depreciated.

Buried Assets

Distribution and Transmission Pipe

Due to limitations within the data set on horizontal assets provided by MWC, significant adjustments were made to allow for our analysis. The process used in making these adjustments and the assumptions used to make the data set useful are outlined below.

Distribution Pipes

a. The basis is the Excel file cataloging water mains by street, as provided in Town-MWC-2-9 Attachment.

b. Using the scale shown on the provided maps, the linear footage of MWC distribution mains was measured.
c. Due to the incomplete list of mains provided in Excel (in comparison to the mains shown on the maps), mains which were not under streets referenced in 2-9 (shaded in light blue) were added to the list of assets.
d. The total length of mains from this analysis suggested about 500,000 linear feet of distribution main were present in the system, which was roughly 100,000 less than was expected based upon other public documentation.
e. Double checking the scale on the maps, it was discovered that the noted scale was incorrect. Using a series of approximately 15 mains, measurements using Google maps indicated that the linear footage measured from the maps was uniformly 15% shorter (+/- 3%) than the measured distances from Google maps.
f. A 15% correction factor was applied to all mains lengths measured from the maps provided.

The following corrections were made to the files to support the analysis:

a. The MWC notations found in Town-MWC-2-9 Attachment as to the material of pipes was standardized (to make them searchable for EUL) as follows:
a. Pipes with no material assigned as ductile iron;
b. Pipes identified as "RTP" were assigned as AC. This is due to the shorter expected life span of AC pipe (in comparison to other options) and the uncertainty of what material RTP is made of;
c. Pipes with multiple materials identified in the table were assigned as first material called out in the MWC table;
d. Galvanized pipe was assigned as Cast Iron (CI);
e. "Iron" pipes assigned CI; and
f. The "effective useful life" (EUL) is dependent upon material of the pipe and engineering guidance on how long pipe of each material should be expected to remain in serviceable condition as part of a potable water system.

The date of installation for each pipe was modified (to support depreciation calculation) as follows:
a. Locations with a decadal timeframe were assigned the middle of each decade;
b. Location with no timeframe were assigned an install date which would assume the pipe is at half of its useful life; and
c. Locations with multiple timeframes were assigned the mid-point of all timeframes noted by MWC.

Metering Assets

The data set provided by MWC has a number of meters with missing dates of install or purchase of meters. To allow for the depreciation to be calculated, the following modifications were made for meters with missing data:
1. In cases where both dates were provided, the later of the two dates was used for the beginning of the depreciation period;
2. In cases where only one of the dates was provided, it was used as the date for the beginning of depreciation; and
3. In cases where neither date was provided, it was assumed that the meter had been installed in 2009 (10 years ago). This assumption is based upon the fact that the average "in service" life of meters in the system is approximately 10.8 years.

Valves

The valve data set provided by MWC was used without adjustments or modifications.

Hydrants

The hydrant data set contained no data of install so the assumption was made that all hydrants were installed in 1982, giving them an age of 1 year less than half of useful life.

Assumptions used in Depreciation Analysis

Inspected Assets

For assets which were inspected as part of this project, there were two assumptions made in the calculation:

1. For assets which included multiple lines and depreciation periods in discovery document Town-MWC-1-18-B, the longest period was used for the book depreciation calculation with a single exception. The exception was the treatment plant which had its longest lasting components being depreciated on a 40 year schedule. This was reduced to 36 years due to the number and value of components in the treatment plant with depreciation periods of less than 40 years.

2. For assets which were rated as being in better than expected condition given their age, the EUL used in the physical depreciation calculation was increased by 10% from the initial engineering EUL estimate. Assets which were rated as being in worse condition than expected had their EUL reduced by 10% from the initial engineering EUL estimate. Based on experience, this is reasonable adjustment. Even an asset that is in better than expected condition should not be considered to have EUL increased by more than 10%.

Buried Assets

1. Although Handy Whitman indices exist for several types of pipe, the Indices titled, "Mains-Average All Types" was used in the calculation of Indexed RCN for all distribution and transmission mains.

We are confident that the figures included in the tables at the beginning of this Report are a fair representation of the reproduction cost new less depreciation for the subject assets based on the information provided to Woodard & Curran in discovery and a group of reasonable assumptions. We reserve the right to supplement this Report based on any additional information and analysis that comes into the record in this proceeding.

Should you have any questions or concerns, please do not hesitate to contact me at 978-482-7912.

Sincerely,
WOODARD & CURRAN

Richard Fedder, P.E.
Senior Vice President