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FEASIBILITY STUDY

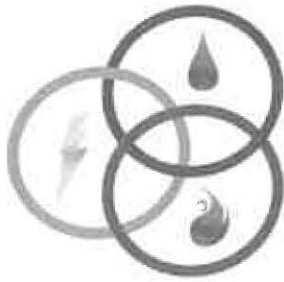
TOWN OF MILFORD, MASSACHUSETTS

JUNE 2, 2014

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JUNE 2, 2014

Mr. Gerald M. Moody, Town Counsel

Town of Milford

52 Main Street

Milford, Massachusetts 01757-2622

Subject: Feasibility Study for the Acquisition by the Town Of Milford of the Water System Owned By the Milford Water Company - A Privately Held Utility

Dear Mr. Moody,

I am very pleased to submit this Final Feasibility Report on the acquisition by the Town of Milford of the water supply and distribution system in the Town of Milford owned by the Milford Water Company. This report consists of a detailed description of our study and analysis along with our findings, conclusions and recommendations. The central purpose of this study and report was to provide the Town with information needed to make an informed decision about whether or not acquiring the privately owned water system would be advantageous to the Town and system ratepayers. This Report is the main deliverable for this project.

Our study and analysis has lead us to the central conclusion that such an acquisition is definitely feasible and should lead to significant savings for the Town and both the residents and business currently connected to the water system and those that will connect in the future. As stated in the Executive Summary, the "bottom line" findings and conclusions are as follows:

- The Town of Milford has the legal authority and appears to have the financial capability to acquire the assets and franchise rights of the privately held water system within its borders.
- If the Town and the Company can agree on a purchase price for all system assets, a deal can be negotiated between the parties and the transfer of assets and franchise rights

can be accomplished without the intervention of any Court or Regulatory Authority, such as the MDPU.

- Because a Town vote to purchase the water system may be binding, the Town should, before taking such a vote, become aware of the likely costs and benefits of a decision to purchase, and to the extent possible, ascertain the likely principles and cost approach the MDPU will rely on if their involvement is required.
- If the MDPU is required to determine the Purchase Price, it is likely to fall within the range established on the low side by application of the Original Cost Less Depreciation (OCLD) method (about \$32 million) of determining value and on the high side by application of the Reproduction Cost New Less Depreciation (RCNLD) method (\$56 million) of determining value. The midpoint value is \$44 million.
- If the Town decides to make this acquisition, the total cost associated with municipal ownership and operation is estimated to be significantly less than it would be under continued private control. Because of this, it is likely that the rates charged to its residents and businesses will be significantly lower than they would have been under continued private control.
- From discussions with Town Officials, we are not aware of any non-economic disadvantages that they are not already aware of, or that they view as being significant enough to outweigh the potential economic advantages.

I wish to thank you and your staff for the assistance provided in preparing for the analysis and constructive comments on preliminary versions. In addition to you, we are also indebted to Ms. Kelly Capece - Acting Town Treasurer and the Attorneys from the law firm of Brown and Rudman, LLC, which provided special legal counsel relative to this possible acquisition. We greatly appreciate the opportunity to work for the Town, and look forward to providing additional services to the Town in the future.

Sincerely,

David F. Russell, P.E., President

Russell Consulting LLC

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Executive Summary

INTRODUCTION

The Town of Milford, Massachusetts (the “Town”) is assessing whether to acquire the water supply and distribution system of the privately held water Company (the Milford Water Company – the “Company” or “MWC”) in the Town of Milford. Given the potential legal and financial ramifications, the Town needs to fully understand the financial and other implications of such an acquisition. The purpose of this study is to analyze both the economic and non-economic impacts of this acquisition along with the financial capability of the Town and to present a comparison of projected water rates under both private and public sector ownership.

This report presents our findings and conclusions based on a comprehensive study designed to provide the Town with information needed to make an informed decision about acquiring the privately owned water supply and distribution system assets within the Town’s borders.

Our evaluation focused on two key questions. First, what will the Town be required to pay the Company for the acquisition of its water system assets in Milford? The purchase price will likely be the primary factor impacting the future cost of water service in the Town. In this case, however, the legislation creating the Company does not establish a specific method for determining the purchase price. Second, what is the likely impact of municipal acquisition on the system’s ratepayers? Sections 6 through 9 present our analysis and findings relative to this question in what is described as the “Base Case.” In section 10 the results of several sensitivity cases are presented to demonstrate the impacts of alternative assumptions that differ from those in the Base Case.

BOTTOM LINE UP FRONT

Based on our comprehensive evaluation of the proposed municipal acquisition of the system and the range of potential impacts that could result from this action, we have reached the following major findings and conclusions:

- The Town of Milford has the legal authority (as determined by Counsel specializing in utility and regulatory matters - Brown and Rudman, LLC) (see Section 3) and appears to have the financial capability to acquire the assets and franchise rights of the privately held water system within its borders.
- Because a Town vote to purchase the water system may be binding, the Town should, before taking such a vote, become aware of the likely costs and benefits of a decision to purchase, and to the extent possible, ascertain the likely principles and cost approach the Massachusetts Department of Public Utilities (MDPU or the "Department") will rely on if their involvement is required.
- The Acquisition Price is likely to fall within the range established on the low side by application of the Original Cost Less Depreciation (OCLD) method of determining value and on the high side by application of the Reproduction New Less New Less Depreciation (RCNLD) method of determining value. Due to the fact that the current private Company will have no remaining ratepayers if the acquisition takes place (as they will all become customers of the Town owned system), it is likely that the acquisition price (as determined by the MDPU), will not greatly exceed the mid-range value based on those two valuation methods, and may be based primarily on the OCLD method.
- Because of the importance of the purchase price in the financial evaluation of the Town's decision to acquire this water system and the uncertainty associated with the RCNLD value, we recommend that the Town contract a qualified firm to perform a comprehensive appraisal of the RCNLD value of this water system before it takes a vote on whether it should acquire these assets.
- If the Town decides to make this acquisition, it is likely that the rates charged to its residents and businesses will be significantly lower than they would have been under continued private control, particularly over the long run.

- From discussions with Town Officials, we are not aware of any non-economic disadvantages that they are not already aware of, or that they view as being significant enough to outweigh the potential economic advantages.

APPROACH AND ANALYSIS

ACQUISITION PRICE ESTIMATE

Clearly the preferred approach to setting the terms of the acquisition, including the purchase price, would be through a negotiation process mutually agreed to by both parties. However, should the Town and the Company be unable to agree on the property to be purchased and/or the value for that property, the Town (or the Company) can petition the Supreme Judicial Court ("SJC") to resolve the issues. The Court will, in turn, delegate its authority on this matter to the Department, which will make the requisite findings and determinations.

The purchase price is critical to the decision facing the Town in that its magnitude is likely to be the predominant factor in the evaluation. This estimate is a key input to the financial forecast model used to evaluate the Town's projected cost of operating the water system. The Town's legal consultant has examined the legal precedents and determined the likely range of purchase prices that the Commissioners of the Massachusetts Department of Public Utilities (MDPU) would consider approving is bounded on the low end by the Original Cost Less Depreciation (OCLD) value, and on the high end by Reproduction Cost New Less Depreciation (RCNLD) value. The range of values is calculated in Section 6 of this report. We have determined the midpoint value of these two extremes to be \$44 million. Section 10 presents a sensitivity case that assumes the Department approves the high end of the range.

TOTAL COSTS AND REVENUE REQUIREMENTS

A spreadsheet model was developed to estimate the costs of providing service under municipal ownership starting in FY2015 to compare the total revenue requirements of a Town owned system versus what they would be under continued ownership by a private company. The results for each component and totals under both ownership options are provided on Schedule

9-1. This schedule shows the component and total revenue requirements assuming municipal ownership and operation. Total costs under the public option start at approximately \$6.8 million in FY2015, takes a sizable jump in 2018 (to \$7.5 million) when full debt service payments associated with the bonds needed to finance the purchase are issued, and then rises linearly to \$9.7 million in 2024. Over the first ten years of the forecast period this is equivalent to a 3.6% compound escalation rate. In comparison, costs and rates under private operation have historically increased at an average rate of at least 5% per year.

Also shown on Schedule 9-1 is the total revenue requirements associated with continued private control. This is estimated by increasing the total revenue recovered by MWC in 2015 by 5.0% annually over the forecast period. Schedule 9-1 also shows the estimated difference between the level of rate revenues required under municipal ownership and operation versus continued private ownership. Positive numbers indicate estimated savings under municipal control. Estimated savings in the first year is about \$400,000 (5.5% lower than the private option). For the next 4 years (2016 through 2019) the savings average about \$800,000 (about 10.5% less on average). From there the savings increase by about \$250,000 per year through the end of the first 10 years (2024 – savings equal about \$2.36 million, a 19.6% savings).

Bottom line impact is immediate savings that continue to grow each year under municipal control. By 2019 estimated cumulative annual savings exceed \$3.8 million and by 2024 they equal about \$13.2 million. These savings are largely due to three inherent differences (advantages for publicly owned systems) between publicly and privately owned utilities:

- Publicly owned utilities do not have to earn a return for owners/stockholders
- Publicly owned utilities do not have to pay franchise or income taxes
- Publicly owned utilities can borrow money at significantly lower interest rates

SENSITIVITY ANALYSIS

In order to test the sensitivity of key assumptions we substituted revised estimates that tended to make the economics of the municipal acquisition less attractive. For example, we tested

how results would change if the purchase price turns out to be significantly higher than the estimate used in our base case. This scenario would be realized if the Department's decision tended toward the high end of the Purchase Price range, set by the Reproduction Cost New Less Depreciation (RCNLD) value. We also developed sensitivity cases to examine unfavorable variations in the following factors: initial O&M costs under municipal ownership, escalation rate of costs under public ownership, interest rates on borrowed funds, and the escalation rate of costs under private ownership.

While all of the assumptions tested did impact the relative economics of the municipal acquisition option, the impacts were not of sufficient magnitude to result in the public option costing more than continued private control unless the revised assumption was considerably different from the base case. In general, the results were relatively insensitive to reasonable variations in the base case assumptions. This added considerable confidence about our estimate of the likely savings associated with municipal acquisition.

CUSTOMER IMPACTS

Figure 2-1 shows a graphical comparison between the typical annual water bill (90,000 gallons) for Milford Water Company's residential customers and the bills for 29 similar Massachusetts communities at the same consumption level. Ninety thousand gallons is approximately the amount that the average household of 3 or more in Massachusetts use in one year. The average annual bill at this level of usage for the 29 community sample is \$443. The average bill for Milford's residential customers is currently \$628, which is 41.7% higher than the average for this sample. When compared with the 2012 state-wide average annual bill of \$498, Milford is 26.1% higher, still a considerable difference.

Because total costs are expected to be considerably less under municipal control, the rates charged to all customers should be lower than they would be under private ownership. The Town could decide to adopt the same rate structure and class contributions that the Company currently has in effect. However, if the Town did take over the water system, it would not be bound by the same rate structure or class allocations that were approved in MADPU 12-86.

Indeed, the Town's rate design preferences are likely to diverge considerably from those of the Company's management.

FINDINGS AND CONCLUSIONS

The key findings and conclusions relative to our study and analysis are outlined below. Together they provide the information needed to make an informed decision as to the feasibility and desirability of the Town acquiring the assets of the privately held water system.

- Legal Consultants have verified that the Town has the legal authority to acquire the privately held water system in Milford.
- It appears that the Town has sufficient borrowing capacity to purchase the Company's assets in Milford and fund needed capital improvements (assuming that the Town will recover revenue from water service charges equal to the levels estimated in the Base Case).
- The estimated purchase price for acquiring the assets of the private water Company is \$44,000,000.
- The total cost associated with municipal ownership and operation is estimated to be significantly less than it would be under continued private control.
- Rates for water service are estimated to be considerably lower than under continued private control.

Relative to the legal authority of the Town to effectuate this acquisition the Town's Legal Consultant offered the following:

"On March 9, 1881, the Massachusetts legislature voted to incorporate the Company for the purpose of furnishing the inhabitants of Milford with pure water for the extinguishments of fires, and domestic and other purposes . . ."¹ The Milford Water Charter also gives the Company the right to set rates and collect revenues.² Per the legislation, and as detailed below, the Town has the right to purchase the Company.³

'The town of Milford shall have the right at any time during the continuance of the charter hereby granted, to purchase the corporate property and all the rights and privileges of said company at a price which may be mutually agreed upon between said corporation and the said town of Milford; and the said corporation is authorized to make sale of the same to said town.'

Accordingly, as long as the Company's Charter remains in existence, the Town has a right to purchase the Company's property."

As indicated in this report a comprehensive evaluation of the water system's facilities was completed in 2010 by Tata and Howard, Inc. If the Town is not satisfied with the evaluation of any of the assets reviewed by that Company, it should take measures to have those facilities fully evaluated by another consulting engineer before a final determination is made to proceed with acquisition. Additionally, because three years have elapsed since completion of that study, the Town should have an engineering evaluation performed on any additions, betterments and retirements that have taken place since that study was completed.

¹ St. 1881, c. 77 ("Milford Water Charter").

² Milford Water Charter §4.

³ *Id.* at §9.

Before a final estimate of the Purchase Price can be precisely determined, the following information relative to changes in system assets must be taken into account:

- Any additions to Plant and Equipment after the date of the decision in MDPU 12-86 (exclusive of the posttest year additions allowed by the Department)
- Any betterments after the date of the decision in MDPU 12-86
- Any retirements after the date of the decision in MDPU 12-86 (exclusive of the retirements allowed by the Department in that Decision and Order)
- Any contributions (CIAC), grants, and other zero-cost plant additions after the date of the decision in MDPU 12-86

SECTION 1 – INTRODUCTION

SECTION 1.1 – OVERVIEW

The Town of Milford is facing a critical challenge in determining whether to proceed with acquiring the water supply and distribution system of the MWC located in the Town of Milford. Given the potential legal and financial ramifications, the Town needs to fully understand the impacts of proceeding with such an acquisition. The Town, through its Legal Counsel, has sought these services to assist the Town of Milford in determining whether or not it would be in the best interest of the Town and the ratepayers of water service within the Town to purchase, own and operate the privately held water system now serving most of the residents and businesses within the Town's borders.

Russell Consulting LLC is pleased to submit this report to assist the Town in undertaking this evaluation. This report provides the Town with information needed to make an informed decision about whether or not acquiring the privately owned water supply and distribution system within the Town's borders would be advantageous to the Town and system ratepayers.

Because of the nature of this type of study and its many implications going forward the Town has also recognized the need and desirability of seeking the advice and counsel of a legal firm with experience and expertise in municipal law, acquisitions and public takings. We have worked closely with Brown Rudnick, LLP, utilizing their legal expertise on all matters requiring legal research, analysis and/or opinions.

SECTION 1.2 – Background

The Town of Milford is currently provided water service by the Milford Water Company, a privately held company that is an affiliated company of the R. H. White Construction Company. The Company supplies about 9,000 customers with an average daily demand of 3.0 million gallons per day (MGD), and a peak demand of 5.5 MGD. Because of

concerns about diminishing quality of service, recent contamination events and the aftermath, and high rates for water service, the Town is seriously considering the acquisition of the privately held water company within the Town's borders. Russell Consulting LLC was retained to conduct a feasibility study of the proposed acquisition. This Report is the main deliverable of that work.

Relative to the quality of service provided by the Company, the Town recently experienced an extended period of boil water precaution due to contamination of the Company's water supply. From our experience in the last three rate case proceedings, we are also aware of other significant problems with the quality of water supplied by the Company and the level of service they provide to Milford customers. While some may argue that the level of service provided by MWC is inferior to most other systems, many would agree that the level of customer service provided by MWC is at best about average, and may be below average.

SECTION 1.3 - Purpose

The purpose of the study was to analyze both the economic and non-economic impacts of municipal acquisition along with the financial capability of the Town and to present a comparison of projected water rates under both Town and continued private ownership.

This report presents our findings and conclusions relative to the central questions that must be answered in order to make an informed decision as to the feasibility and desirability of the Town acquiring the Assets of the privately held water system. These questions include:

- What will the purchase price be for acquiring the assets of the private Water Company in the Town of Milford?
- If acquired, what will it cost the Town to own and operate the water system as an Enterprise Fund or through contract operations?

- What are the primary advantages and disadvantages of municipal ownership and operations?
- What is the condition of the Water Company's existing system and what capital improvements are needed?
- What are the legal and institutional issues and considerations pertinent to this potential acquisition?
- What will the impact of the acquisition be on water rates and on the Town's residents and businesses served by this water utility?

The answers to these questions should provide the Town with key decision factors needed to determine whether or not the Town should take ownership of the private water company. While non-economic factors can play a major role in the Town's decision to acquire the assets of MWC, the primary factor is whether or not the acquisition makes economic sense. If it can be demonstrated with a reasonable level of certainty that ratepayers will pay less, or at least not significantly more, for their water service with public ownership, particularly in the long run (say beyond the first five or six years) then public acquisition becomes a feasible and viable option. Usually the biggest hurdle to get past is the price that the Town will have to pay the Company as compensation for its assets. Other key factors include the Town's financial capability and the associated interest rate for borrowed funds, the Town's cost to operate and maintain the system, and the level of capital improvements needed during the early years of public control. All of these factors should be fully evaluated before deciding whether or not to proceed with the acquisition.

SECTION 1.4 - Approach and Scope of Work

Our analysis is designed to provide the necessary information for the Town of Milford to determine the feasibility and impact of acquiring the Milford Water Company prior to formally proceeding with the acquisition. Based on our discussions with the Town, we understand that any attempt to acquire the Milford Water Company might possibly be

viewed as an “unfriendly take-over.” Therefore, for purposes of this study, it was assumed that cooperation from MWC could be limited, and that most of the required data would be obtained from publicly available sources such as annual reports filed with the Massachusetts Department of Public Utilities (MDPU) and information contained in the recent rate case through the Town’s intervention.

Our analysis focused on two key issues. First, what will the Town be required to pay the Company for compensation should it decide to go forward with the acquisition? The purchase price will likely be the primary factor impacting the future cost of water service in the Town. Brown Rudnick has provided the Town of Milford with their analysis of the regulatory process relating to the potential acquisition of the Milford Water Company; their findings have been incorporated into our financial analysis and recommendations. Second, what will the impact be on the ratepayers of municipal acquisition and operation? We have prepared a range of values for all system assets based on alternative valuation methodologies. This will be used by the Town as a guide in determining the purchase price for this utility system. This task also includes a summary of the system’s assets and the current cost of operating the system.

We are confident that this report will provide the Town with a sound evaluation of these key questions, which will enable the Town to make a well-informed decision before moving forward. We have evaluated and addressed these issues for a number of clients in a range of circumstances. In several cases, the communities elected to proceed with the acquisition, while some communities chose not to proceed. The facts of each situation dictate the outcome. In those cases where the communities chose not to proceed, our analysis assisted the community in obtaining a higher level of service or reduced cost of service.

SECTION 1.5 - Report Outline

In addition to this introductory section, this report contains eleven other sections, which are outlined below.

Section 2 – Water Rates in Milford and Comparable Communities

Section 3 – Municipal Acquisition: Institutional and Legal Issues

Section 4 – Advantages and Disadvantages

Section 5 – Description of Existing System and Recommended Improvements

Section 6 – Estimated Acquisition Price

Section 7 – Funding the Cost of Acquisition and System Improvements

Section 8 – Operations and Maintenance Costs

Section 9 – Total Revenue Requirements and Rate Impacts

Section 10 – Sensitivity Analysis

Section 11 – Customer Impacts

Section 12 – Summary, Conclusions, and Recommendations

SECTION 2 - WATER RATES IN MILFORD AND COMPARABLE COMMUNITIES

SECTION 2.1 - Overview

In order to put the rates for general water service charged by Milford Water Company into perspective this section contains a comparison of typical annual water bills charged to residential customers in Milford for a range of usage levels at current rates.

Additionally, we compare these charges to what a sample of similar communities in Massachusetts are charging.

SECTION 2.2 - Rates for General Water Service in Milford

Historically, how have Milford Water Company's customer charges (water rates) compared with those of similar communities in Massachusetts? In the past, the rates charged by the MWC were somewhat less than the State average. However, with the recent 50% increase their rates will be significantly higher than the State average (\$620 versus \$498 for typical annual consumption). This rate increase took effect in the fourth quarter of 2013.

Milford Water Company currently charges residential customers in Milford a two part rate consisting of a fixed charge per quarter (Customer Service Charge) that varies according to the size of the customer's meter, and a two block (increasing) volumetric rate (dollars per hundred cubic feet, or \$/HCF) (HCF – Hundred Cubic Feet). The lower first block rate is applied to all usage up to 4,800 cubic feet per quarter, and the second higher block rate is applied to all use above 4,800 cubic feet per quarter. The majority of residential customers have 5/8ths inch meters and are currently charged according to the following quarterly rate schedule:

Table 2-1 Milford Water Company, Schedule of Rates (Effective November 2013, 5/8" and 1" meter service)

Fixed Charges	5/8" Service	1" Service
Customer Service Charge	\$34.24 per Quarter	\$42.97 per Quarter
Uniform Volumetric Charge		
First 4,800 CF per Quarter	\$4.095 per HCF	\$4.095 per HCF
Over 4,800 CF per Quarter	\$6.143 per HCF	\$6.143 per HCF

Based on these rates for general water service, we prepared Table 2-2 which shows the total annual charges to a residential customer in Milford under the rates approved by the MDPU last year (M.D.P.U. No. 21 – RATES FOR METERED SERVICE, Effective November 27, 2013). The total charges to residential customers at 6 different levels of consumption are provided – 30,000 to 210,000 gallons per year at 30,000 gallon increments. Table 2-2 also shows the total charges for customers with both 5/8ths inch and 1 inch meters. The quarterly service charge for residential customers with 5/8ths inch meters (most common) is \$34.24, while customers with 1 inch meters (relatively large usage customers) are charged \$42.97 per quarter.

Table 2-2 Milford Water Company, Residential Customer Bill Impacts (5/8" and 1" meters)

Annual Consumption (thousands of gallons)	Annual Consumption (HCF)	Annual Bill (5/8 inch meter)	Annual Bill (1 inch meter)
30	40	\$300.76	\$335.68
60	80	\$464.56	\$499.48
90	120	\$628.36	\$663.28
120	160	\$792.16	\$827.08
150	200	\$972.36	\$1,007.28
180	240	\$1,218.08	\$1,253.00
210	280	\$1,463.80	\$1,498.72

Because the break point between the 2 block rates is high (48 HCF per quarter) only those residential customers that use more than 192 HCF (or 144,000 gallons) per year

have a portion of their consumption billed at the higher second block rate. Those using 240 HCF per year have about 20% of their consumption billed at the second block rate, and those using 280 HCF per year have about 31% of their consumption billed at the second block rate. Thus, for residential customers, the rate structure applied to all but a few large users is effectively a uniform consumption charge.

SECTION 2.3 - Comparison of Rates in Milford with Other Communities

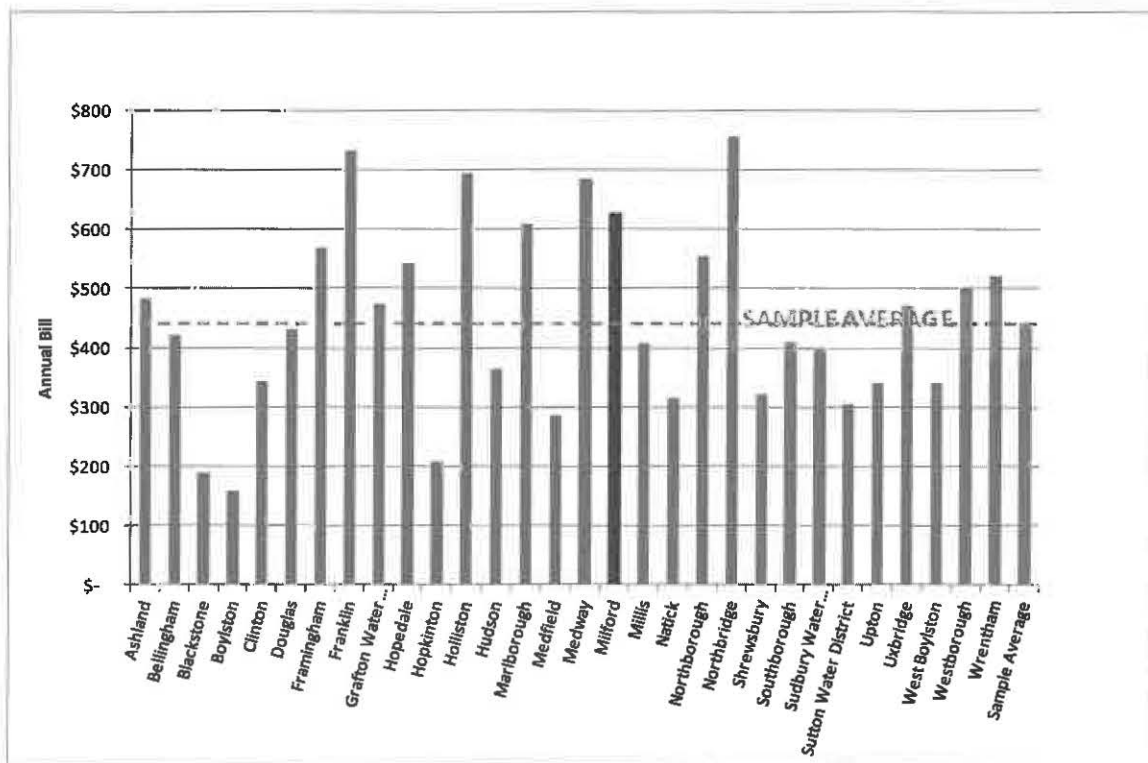
This section provides a comparison of the charges to Milford's residential customers with those paid by residential customers in several nearby cities and towns. A representative sample of 29 communities was examined, all of which are within a 20 mile radius of Milford. These communities mostly fall along the I-495 or I-90 corridor, stretching from Hudson to the north, Blackstone (on the Rhode Island border) to the south and from Grafton in the west to Medfield in the east. Average annual cost data for these communities was extracted from Tighe & Bond's biennial Massachusetts Water Rate Survey, last published in 2012. The following comparisons are made with the latest data available for water rates in the 29 community sample and Milford Water Company's current rates, which took effect in November of 2013.

SECTION 2.3.1 - COMPARISON 1: AVERAGE RESIDENTIAL CUSTOMER

The average household in Massachusetts that consumes approximately 90,000 gallons every year (120 HCF) pays a total bill of \$498. Figure 2-1 shows a graphical comparison between the typical annual water bill (90,000 gallons) for Milford's residential customers and the bills for twenty-nine other Massachusetts communities. The average annual bill at this level of usage for the 29 communities in this sample is \$443. The average bill for Milford's residential customers is currently \$628, which is 41.7% higher than the average for this sample. The range of bills in this sample starts on the low end at \$158 (Boylston) and at the high end reaches \$756 (Northbridge). Only four communities have higher bills than Milford at current rates, and twenty-five have lower bills including nine with substantially lower bills (at least 50% lower). When compared

with the 2012 state-wide average annual bill of \$498, Milford is 26.1% higher, still a considerable difference.

Figure 2-1 Comparison of MWC to 29 Surrounding Communities (90,000 gallons per year)

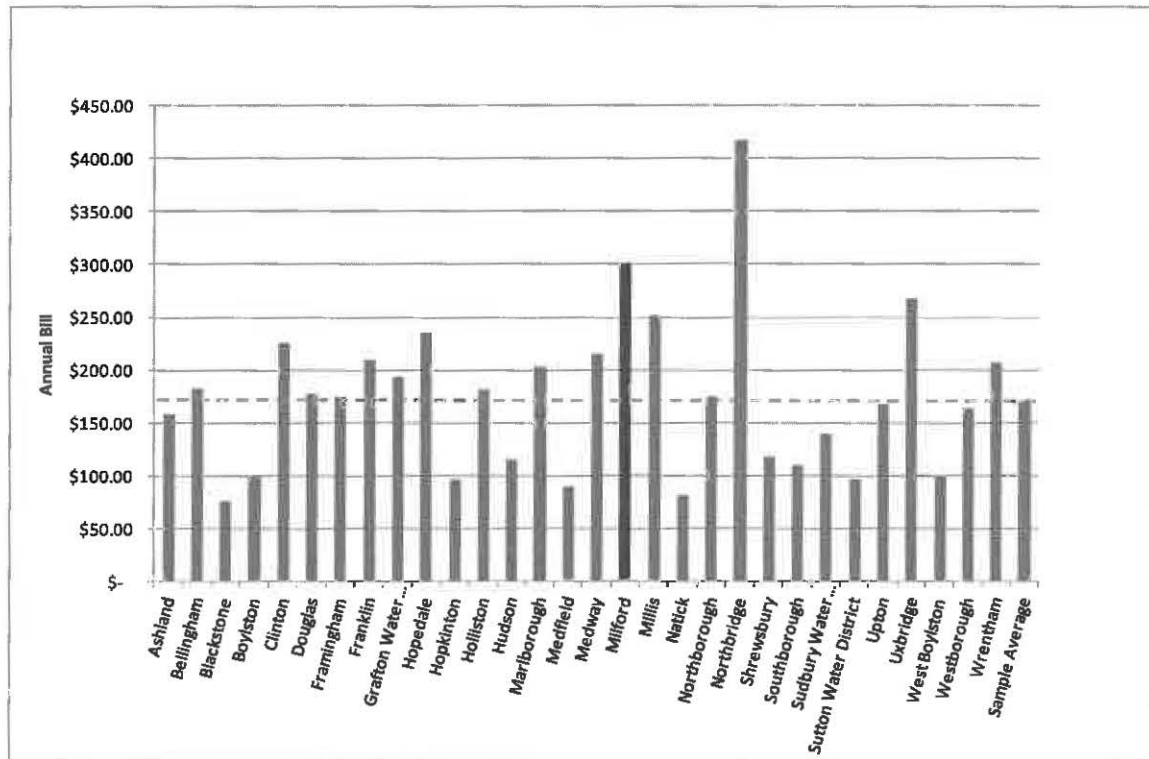


SECTION 2.3.2 - COMPARISON 2: AVERAGE APARTMENT OR CONDOMINIUM CUSTOMER

The second comparison is at a level of usage that is typical of the amount of water that one or two people living in an apartment or condominium would use in one year. This customer group does not typically use water for irrigation, washing cars, or for other outdoor purposes. Figure 2-2 shows a comparison between the annual water bill at the 30,000 gallon usage level in Milford and comparable bills for twenty-nine other Massachusetts communities. The average annual bill at this level of usage for the twenty-nine community sample is \$170. In Milford, the total annual cost is \$301, which is 77% higher than the sample average. The bills range from a low of \$76 (Blackstone)

to a high of \$417 (Northbridge). All but one of the communities in our sample have lower bills than Milford, with only Northbridge coming in higher.

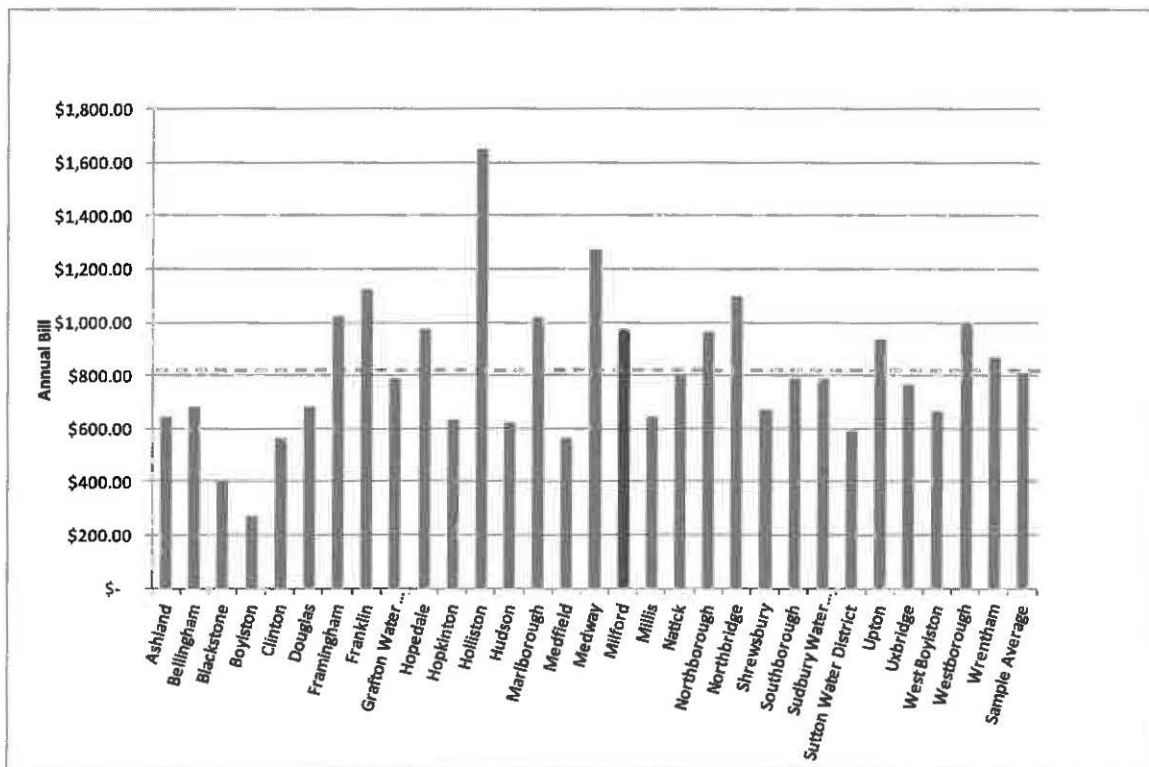
Figure 2-2 Comparison of MWC to 29 Surrounding Communities (30,000 gallons per year)



SECTION 2.3.3 - COMPARISON 3: HIGH-CONSUMPTION RESIDENTIAL CUSTOMER

The final comparison is made at a relatively high level of consumption for a residential customer and would be typical of a large household with significant outdoor water usage. Figure 2-3 shows a comparison between the annual water bill for 150,000 gallons in Milford and comparable bills for twenty-nine other Massachusetts communities. The average annual bill at this level of usage for the twenty-nine communities is \$810. The bill for Milford's residential customers is currently \$972, which is 20% above the average. The bills range from \$270 (Boylston) to \$1,649 (Holliston). Twenty-one communities have lower bills than Milford, and eight have higher bills. Of the eight communities with higher bills, only two are substantially higher: Holliston (70% higher) and Medway (31% higher).

Figure 2-3 Comparison of MWC to 29 Surrounding Communities (150,000 gallons per year)



SECTION 2.4 – Summary

The three preceding comparisons are summarized in Table 2-3. For each of the three consumption levels examined, the 29 community sample average is presented along with the corresponding charges in Milford and the difference in dollars and percentage, which is higher in Milford in all cases.

Table 2-3 Milford Water Company, Current Annual Bill versus 29-Community Average

Annual Consumption (thousands of gallons)	Milford Annual Bill (at Current Rates)	29 Community Average Annual Bill	Milford Bill minus 29-Community Average (\$ Higher)	Milford vs. 29-Community Average (% Higher)
30	\$301	\$170	\$131	77%
90	\$628	\$443	\$185	42%
150	\$972	\$810	\$162	20%

From this analysis, it is clear that the current charges in Milford are much higher than the sample communities over a broad range of consumption levels for residential customers. This is particularly troublesome given that Milford Water Company sought a much higher increase in its rates last year than what the MDPU allowed. Furthermore, the Company made it clear that they intended to propose rate increases every two years going forward. It is reasonable to expect that in about one year from the date of this report, the Company is likely to propose another very sizable increase in its rates for all customers. From past experience and the size of the reduction in the last rate case, it is very likely that this next proposed increase would be at least 15%; somewhat likely that it would be between 15% and 25%; and could possibly exceed 25%.

Section 3 - Municipal Acquisition: Institutional and Legal Issues

SECTION 3.1 - Introduction

This section presents the findings and opinions of the Legal Firm (Brown Rudnick, LLC) retained by the Town to address issues relative to the Town's authority to acquire the assets of the private water Company currently serving many residents and businesses in Milford, along with related legal and institutional matters associated with such an acquisition. Their opinions relative to these matters are provided in a Memorandum to Milford's Town Counsel dated February 20, 2014. A Copy of this Memorandum (with redacted sections) is provided in Appendix A.

SECTION 3.2 - Key Findings and Conclusions

In the Introduction Section of the February 20th Memorandum, Brown Rudnick presents their principal findings and conclusions. These are repeated below and each bullet is replaced with a number for ease of reference:

- 1) The Town has a statutory right to purchase the Company, if two-thirds of the voters favor the purchase. Once that vote is taken, the Town may be compelled to move forward with the acquisition;
- 2) If the Company and the Town agree to the terms of the acquisition, no judicial/regulatory action is required;
- 3) Should the Town and the Company be unable to agree on the property to be purchased and/or the value for that property, the Town (or the Company) can petition the Supreme Judicial Court ("SJC") to resolve the issues;
- 4) The Court will, in turn, delegate its authority on this matter to the Department of Public Utilities ("Department"), which will make the requisite findings and determination;

- 5) In evaluating what constitutes the property to be purchased, the Department will likely require the sale to include all of the Company's property and franchise rights, including intangible assets, such as reports prepared for capital improvements that were not undertaken, customer records, water quality records, maintenance records, trained workforce and possibly outstanding debt;
- 6) Given the lack of specificity in Milford Water's charter, there is a substantial likelihood that the Company's property will be valued, in whole or in part, at the fair market value using Reproduction Cost New Less Depreciation (RCNLD). The Department may also consider the book value of the Company's property through Original Cost Less Depreciation ("OCLD");
- 7) Per Milford Water's charter, the Department's decision must be "accepted" by the SJC, which typically is attained if no party appeals the Department's decision within 20 days of its service, or at the time that the SJC issues its decision. If a party does appeal the decision, it is likely that the SJC would employ the standard of review for appeals of other Department decisions pursuant to G. L. c. 25, §5.4

SECTION 3.3 – Impact on Feasibility Study

Each of the seven points discussed above has a direct impact on the direction and analysis performed as part of this Feasibility Study. For the most part, these impacts are clear as written by Brown Rudnick. However, because they are critical to the analysis

⁴ There is no precedent for the interpretation of the SJC review of the Department's ruling pursuant a municipal water company's charter and/or G. L. c. 165, § 5.

and direction of this study, the relevance of each point is summarized below in the same order as listed above.

- 1) The Town has the legal right to purchase the assets of the Milford Water Company which is a privately owned Company currently providing potable water services to residences, businesses and government agencies in the Town of Milford. Such a purchase must first be approved by two-thirds of the voters at a duly noticed Town meeting. Because such a vote may be binding, the Town should, before taking such a vote, become aware of the likely costs and benefits of a decision to purchase, and to the extent possible, ascertain the likely principles and cost approach the Department will rely on if their involvement is required.
- 2) This would be much preferred by the Town, if MWC was inclined to be reasonable with respect to the price. It is worth exploring, particularly since the Company is essentially family owned with only a few sizable owners and an amicable settlement may be preferable to extended litigation by both parties. However, such negotiated deals have been very rare.
- 3) As stated if the parties cannot agree on price, either party can petition the SJC to resolve issues of price and which assets to include in the purchase.
- 4) In turn the SJC will delegate its authority to the Department. This is the likely process, if the parties cannot agree on the Price. The Department of Public Utilities is, at least in theory, required to balance the needs of the utility and the impacts of their decisions on the ratepayers of the utility providing them service. However, in a case such as this the Department may be inclined to act more favorably in the direction of ratepayers, since the private company will, after the price is determined, have no responsibility in continuing to provide utility service to ratepayers in Milford or any other ratepayers/consumers of utility services. That is, unlike similar acquisitions by a town or city, the private utility that sells

part of its franchise area is left with other service areas and ratepayers, and those utility customers need a financially healthy company to continue providing quality service to them.

- 5) If the Department is involved, it is likely to require the Town to purchase some or all of the assets listed by Brown Rudnick. However, the physical assets are very likely to comprise a very large portion of the price determined by the Department. Furthermore, unless the Company's outstanding debt is more than the book value (original cost less accumulated depreciation – which is probably the minimum purchase price that the Department would allow); it is very unlikely that the Department would add an amount to their approved purchase price that would compensate the Company for any of its outstanding debt.
- 6) Brown Rudnick is probably correct in its opinion that the likely range of purchase prices that the Department would consider approving are bounded on the low end by the Original Cost Less Depreciation (OCLD) and on the high end by Reproduction Cost New Less Depreciation (RCNLD). Thus, to be conservative we will use an estimate of the mid value of these two extremes for the base case in our analysis, and include a sensitivity case that assumes the Department approves the high end of the range. We also note that while the range between OCLD and RCNLD for many utilities is fairly large, the range in this case is relatively small because MWC recently added a new treatment plant that effectively doubled its total value of plant. Thus, approximately half of its plant assets have almost the same value under both the OCLD and the RCNLD methods of determining value.
- 7) This point simply means that unless there are very unusual circumstances associated with the Department's decision, if required in this case, it will be upheld by the State's Supreme Judicial Court (SJC). Therefore, if the Department does get involved, it is very likely that the price determined by the Department will be the price the Town will have to pay, barring very unusual circumstances.

SECTION 4 - Advantages and Disadvantages

SECTION 4.1 – Overview

In this section, we will take a look at the arguments for and against municipal control of the Town's water utility. The primary advantages associated with municipal control are: greater control of rates and potentially lower rates for water service, direct control of management and operations, and direct control over quality of service and customer relations. The primary disadvantages are: greater financial risk, responsibility for all service issues (double edged sword), and loss of State oversight in the form of regulations with respect to rates and consumer protection.

The Town (officials and customers) must weigh these factors and decide if the advantages outweigh the disadvantages. It may be that the economic advantages are great enough that they far outweigh any of the disadvantages. On the other hand, if the economic advantages are close or only favor municipal control by a relatively small amount, the other non-economic factors may play an important role in the decision process.

SECTION 4.2 – Economic Considerations

In evaluating the feasibility of a municipal acquisition two key issues must be addressed. First, can the Town finance the purchase price and any needed capital improvements in the first several years. Second, does it make economic sense, i.e. will the ratepayers be better off after the Town takes control of the water system. In addition to these two central issues there are a range of potential advantages and disadvantages associated with municipal control that should be considered. Some of these non-economic issues may become important factors in making the choice between acquiring the system and staying with the status quo, particularly if the economic factors are not controlling.

While the cost of water in the Town is a key issue in deciding whether or not to acquire the water system, the quality of service is another important factor. From our

involvement in three prior rate cases and the case involving the contamination event in August 2009, it would appear that there has been a high level of dissatisfaction with the overall quality of water service. Additionally, the Company's responsiveness to the Town's concerns and those of individual customers seems to be lacking.

The traditional arguments favoring municipal control center on the fact that a public agency does not have to earn a return (dividends for owners/stockholders), does not have to pay income or franchise taxes, and generally has lower capital costs than the private alternative. Those favoring private control counter that to the extent their total costs of owning utility asset may cost more than under municipal control, these higher costs are more than offset by the efficiency and productivity associated with private control. While the arguments from both sides are valid in general, the specific circumstances of a particular system must be fully evaluated before the relative economies under the two ownership options can be ascertained. Thus, each system must be evaluated on a case-by-case basis. In some cases municipal ownership can be more cost effective, while in others private ownership may lead to overall lower costs. In evaluating the relative economies of a municipal acquisition, such as the case at hand, an excellent yardstick is a comparison of what the total charges to all customers will be under both options. If, for example, the total charges (revenue requirements) are significantly less during the first ten years following a municipal acquisition, then the relative economics would favor municipal control; and unless there are one or more major non-economic disadvantages associated with this acquisition, the decision to acquire the system would be relatively easy. Similarly, the decision would be relatively easy (in the other direction) if the total charges under municipal control were expected to be significantly higher, and there were no other compelling advantages associated with the acquisition. If the total charges under both ownership options are expected to be about the same, then other non-economic advantages could prove to be the deciding factors.

Another economic factor to consider is control over the allocation of costs to customer classes and to individual customers through rate design (rate structure). Even if the total costs are about the same under each ownership option, the impacts on groups of customers and individual customers are largely dependent on these two allocation issues. If Town officials tend to agree with the cost allocations and rate design used by the private company, then control over these factors may not be viewed as a significant advantage of municipal control. However, in cases such as this one where Town Officials have major disagreements with how the Company allocates costs and design rates, such control is likely to be viewed as a very significant advantage. In the last two rate cases, the Town has opposed the high breakpoint between rate blocks that is favored by the Company and that establishes the level (relatively high) of consumption at which customers start to pay the much higher second-block rate for all use above that level. Such a high level eliminates having a conservation rate that could be taken advantage of by a large number of residential customers, since as indicated above, the vast majority of residential customers do not have any of their consumption billed at the higher rate. Thus, for all intents and purposes, almost all residential customers are billed on a uniform rate structure. If the break point was significantly lower (say 50 % lower) a lot more discretionary (non-essential) water would be billed at the higher rate, which would have to be offset by a lower first block rate that would lower charges to all customers for their non-discretionary (essential) use for health and sanitary purposes.

SECTION 4.3 - NON-ECONOMIC CONSIDERATIONS

In addition to the impact on customer water rates, certain non-economic factors should be considered by the Town in deciding whether to acquire the Milford Water Company assets. These include accountability of water operations to customers, quality of water service, control over capital improvement programs, choice of operating organization, and control over water rates and rate structure.

With the Town overseeing water operations and taking responsibility for setting customer water rates, Milford residents will have more direct control over service. Implementation of the capital improvement program, which is reflected in the availability and the quality of water delivery, will be under direct control of Town officials instead of Water Company employees. Also, responsibility for rate increases will rest with the Town, rather than the Massachusetts Department of Public Utilities. While these benefits cannot be quantified, they are important factors to weigh in the decision to proceed or not with the acquisition.

SECTION 4.4 – Other Considerations

Some issues relative to the Town as a customer of the Company are summarized below.

SECTION 4.4.1 - GOODWILL AND COMMUNICATION BETWEEN PARTIES

From our participation in the last three rate cases for this Company and the circumstances surrounding the contamination event in 2009, it appears that the Town's administrators and many of its residents do not hold the Company in high regard. At each of the public hearings preceding each of the prior three rate cases, large numbers of residents showed up and many ratepayers expressed their opposition to the proposed increase and many raised other concerns and complaints about the water quality and deficiencies in the manner and level of customer service provided by Company employees. This general dissatisfaction was exacerbated by the events surrounding the contamination event in the summer of 2009 and its aftermath. The Town called for a comprehensive investigation by the MADPU of the Company's actions prior to, during and subsequent to the event. The MADEP issued an Administrative Consent Order as a result of the event. Many deficiencies were identified and brought to the public's attention as a result. A criminal case involving the Company's Manager resulted from the investigations. The Manager was since found guilty of criminal actions. A class action suit was also filed by several residents that claimed personal

injuries as a result of the Company's actions. That suit was recently settled in favor of the plaintiffs. It was reported that the settlement amount exceeded \$1,000,000.

Needless to say public relations with Town Officials and residents in general have frequently in recent years been contentious or problematic. In the Company's defense, however, it should be noted that its Management has taken significant measures to improve on the services it provides and its communications with Town Officials and its ratepayers. It remains to be seen, however, if they have done enough to gain back public confidence and a general sense that the service they provide is at least as good as that received by most publicly owned water systems.

The question here is, what is the impact to the Town of a private company providing an essential service to the Town where relations are not cordial and goodwill scarce? If the Town is not satisfied with the nature of the relationship, two alternatives remain. One would be to add weight to the decision favoring the purchase of the water operation from MWC. The other would be to take specific actions to improve the nature of communication between the parties. This latter course, obviously, would not require a municipal acquisition. The Town could, however, seek an agreement or contract between the parties that would specify in greater detail the desired nature of the relationship and even identify some goodwill activities sought by the Town.

SECTION 4.4.2 - FUTURE DEVELOPMENT OF THE TOWN

If the Town grows in any material way, then water supply and its distribution become important factors which will impact on growth. It is our understanding that the Town is interested in encouraging additional commercial and industrial development. Different plans and ideas have surfaced, all of which, if implemented, would add significant new demand to the water system. If the Town does not own the water supply and distribution system, then the Town will not have complete control over the provision of this service in any newly developed area. This situation has been an ongoing problem for the Town in that the Company has been reluctant to make investments necessary to

insure adequate fire protection in certain areas of the Town. Again, the Town can solve this issue by either assuming control of the water company or by entering into an agreement whereby the expectations of the Town are incorporated into the requirements of the Company to serve the Town.

SECTION 4.5 - DISADVANTAGES OF PUBLIC CONTROL

With greater control comes greater responsibility. In acquiring the assets of a private company, the Town will assume all of the risks associated with that ownership. It will have to issue considerable amounts of new debt to pay for those assets in place and for future improvements that will need to be made to maintain the current system and expand it to serve new customer growth. Clearly, there are financial and operational risks associated with such ownership. The Town needs to assess whether or not these added risks are significant disadvantages, or tolerable in light of the other advantages and the overall financial capacity and condition of the Town's financial health.

The Town will also become responsible for providing safe, adequate, and reliable water service to all residents and businesses in the Town—those that are currently connected and those future customers who will be seeking this service. While improved customer service may be a reason for or a goal of municipal acquisition, the Town will need to take control of all activities and personnel involved in assuring that service does improve (or at least does not deteriorate) on a 24/7 basis. This will take considerable time and resources of the Town's Management team in controlling and overseeing the personnel hired and resources purchased to operate and maintain the public water supply system, as well as the quality of the water delivered and the customer service provided.

Improved customer service is a goal the Town can achieve, but it will not happen automatically. It will take considerable ongoing efforts and diligence. The Town's management team will have to take a proactive role and provide the leadership and direction needed to insure the level of service does not diminish over time. This is not meant to discourage municipal acquisition. Rather it is listed as a potential

disadvantage that should be considered fully by Town officials before bringing an acquisition warrant forward. Town officials and current water customers may also view municipal control of service quality as an advantage of such an acquisition.

Another potential disadvantage of municipal control is the fact that the rate regulation by the Department of Public Utilities and its general oversight authority will go away because its jurisdiction is almost entirely restricted to privately owned utilities. Upon acquisition, the Town essentially becomes a self-regulating entity. While one of the Department's central purposes is the protection of consumers and the prevention of monopoly profits, it also must insure that the companies it regulates charge enough to maintain financial health. This means that the company must be allowed to charge enough to pay reasonable dividends, federal income taxes, and generally higher cost debt (as compared to publicly owned utilities). Thus, some would view continued DPU regulation as a disadvantage. Here, as in all similar situations, the Town should consider this change; and if it views this change as a significant disadvantage or advantage, it could become one of the deciding factors in its overall evaluation.

SECTION 5 - Description of Existing System and Recommended Improvements

SECTION 5.1 – Overview

Milford Water Company (MWC) is a private water company that supplies water to the community in the Town of Milford, Massachusetts.⁵ The Milford Water Company has about 8,800 service connections serving a drinking population of approximately 27,100 persons per day. The water system currently obtains its water from two surface water sources which provide 84% of the water and seven active ground water sources which provide 16% of the water needed. In addition to the water sources, the system maintains two treatment plants with pump stations, three storage tanks, one booster pump station that includes a booster chlorination system, and five interconnections with other public water systems: Holliston, Hopedale (2), Medway and Bellingham. An additional hydrant-to-hydrant connection can be made with Hopkinton. The interconnections are for emergency use only. As of August 9, 2011, MWC no longer routinely sells water to Hopedale. The water system used an average of 2.61 MGD for the 2011 calendar year, and 2.59 MGD in 2012. The highest single day water consumption reported for 2011 calendar year was 4.78 MG, and for 2012 it was 5.08 MG in 2012. The water system has two pressure zones. The pressure is maintained between 40-130 PSI. MWC is classified as a Class 3-Distribution System as defined in

⁵ Most of the facility descriptions, evaluations and recommendations were taken from the Tata and Howard Master Plan, dated December 2011. Additionally, some of the descriptions were supplemented from Sanitary Surveys issued by the MDEP and/or responses from MWC provided in the recent Rate Case MDPU Docket 12-86.

310 CMR 22.11B(4)(c). The treatment facilities are classified as being Class 2-Treatment Plants.

SECTION 5.2 – WATER SUPPLY SOURCES

Dilla Street Well #1 and Dilla Street Well #2 are both gravel pack wells located off Dilla Street in Milford. Well #1 is a twelve-inch diameter well constructed to a depth of 39-feet with 30 feet of casing, an 8-foot screen and a submersible pump. Well #2 is an eight-inch diameter well constructed to a depth of 36-feet with 27 feet of casing, a 6-foot screen and a submersible pump. Both wells were constructed in 1984 to replace the Dilla Street Tubular Wellfield which was abandoned in 1986. The wells have an approved maximum daily pumping volume of 0.675 MG.

Clark's Island Tubular Wellfield is located off Sumner Street approximately one mile from the Dilla Street Facilities on a peninsula extending into Cedar Swamp Pond (also called Milford Pond). The wellfield consists of over one hundred 2.5-inch diameter driven point wells (not all in use, 75 active at the time of the July 2011 survey) that reportedly penetrate into the semi-confined aquifer below the water surface of the pond generally to depths less than 35 feet (Whitman and Howard, 1997). The wellfield was constructed in 1962 on Town owned property. MWC pays the Town a set rate per gallon of water pumped from this source. In recent years, this fee has averaged about \$10,000 per year. The pipeline from Clark's Island to Dilla Street is a 24-inch diameter transmission main. The Clark's Island Tubular Wellfield was designed for seasonal use, but has been used through the winter to supplement the supply when needed. The wellfield has an approved maximum daily pumping volume of 0.80 MG. The water from this source is metered and receives treatment at the Dilla Street Treatment Facility.

Cedar Swamp Well, located off Sumner Street at Cedar Swamp Pond, is a naturally developed gravel well that was constructed to a depth of 43 feet with a casing depth of 33 feet, a 10-foot screen and a submersible pump. The well has been approved by the Department as a Zone II. The water from this source receives treatment at the Dilla

Street Treatment Facility. This well is currently inactive and is listed as an emergency source.

Godfrey Brook Well #1 located off South Cedar Street, is a twelve-inch diameter gravel packed well that was constructed to a depth of 34 feet with a casing depth of 29 feet, a 5-foot screen and a 5 HP submersible pump. The well was constructed in 1981.

Godfrey Brook Well #2 located off South Cedar Street, is a twelve-inch diameter gravel packed well that was constructed to a depth of 52 feet with a casing depth of 42 feet, a 10-foot screen and a 5 HP submersible pump. The well was constructed in 1974. The well has been out of service since December 16, 2009 following discovery of a hole in the well screen.

Godfrey Brook Well #4 located off South Cedar Street, is a 4-inch diameter gravel packed well that was constructed to a depth of 43.9 feet with a casing depth of 33.9 feet, a 10-foot screen and a 5 HP submersible pump. The well was constructed in 1981.

Godfrey Brook Well #2A located off South Cedar Street is a twelve-inch diameter gravel pack well driven to a depth of 37.5 feet with a casing depth of 32 feet, and a 5-foot screen. The well casing terminates approximately 4 feet above the ground surface. Well #2A has a 5 HP submersible pump.

Godfrey Brook Well #1A located off South Cedar Street is a 14-inch diameter gravel packed well driven to a depth of 37.8 feet with a casing depth of 29.5 feet, and 8-foot screen and a 5 HP submersible pump. The pump intake is set at 29.5 feet.

The Godfrey Brook Wells #1, 2, 4, 2A and 1A have an approved combined maximum daily pumping volume of 0.79 MG. Each gravel-packed well is equipped with its own well pump that discharges into a common transmission line. The water flows through the common transmission line to the Godfrey Book Treatment Plant where the water is treated before entering the distribution system. There is a master meter for the

combined flow from the wells. The well pumps are operated manually and pump simultaneously.

The Charles River abuts the Dilla Street Facilities. The MWC has four intakes on the Charles River. The Charles River is a seasonal water source. Water is withdrawn from the river during the spring or when high flow allows. Water taken from the river can flow by gravity into the slow sand filters, be pumped into the treatment facilities, or be pumped to Echo Lake to fill the reservoir.

Echo Lake Reservoir is an impounded reservoir owned and maintained by the MWC, located approximately two miles from the Dilla Street Facilities in Hopkinton. It is the main source of water for the Milford Water Company. Water flows by gravity through a single 24-inch AC and ductile iron main to the Dilla Street Treatment Plant.

Louisa Lake is currently an emergency source of water. The water system must receive approval from the MDEP before this source can be utilized. While the surface water sources were not previously metered, as part of the new treatment facility construction project all surface water sources are now metered.

SECTION 5.3 – TREATMENT FACILITIES

SECTION 5.3.1 - THE NEW DILLA STREET TREATMENT PLANT

The MWC was required to replace the Dilla Street Water Treatment Facility by May 31, 2013 per the Administrative Consent Order (ACOP-CE-09-5D007-EMS, SEP) signed November 13, 2009 to come into compliance with the Stage 2 Disinfectant and Disinfection Byproducts Rule. The facility was also designed to remove iron and manganese to below the SMCL limits of 0.3 mg/l and 0.05 mg/l respectively. The new Dilla Street Water Treatment Facility treats water obtained from Echo Lake, the Charles River, the Dilla Street Wells and the Clark Island Wells. The design is based off an average flow of 2.5 mgd and a maximum peak flow of 5 mgd.

At the new facility, water coming from each of the sources flow through a separate raw water line to an underground vault. Each line has its own flow meter and sample port. The three lines (Lake, River and the Well sources) combine with the returned spent water line into a single manifold line. The water is injected with caustic (either sodium or potassium hydroxide) and potassium permanganate and then flows through an enclosed oxidation tank for oxidation of iron and manganese. The water is then injected with a coagulant (PAC) and split to two rapid mix basins. From the basins, the chemically treated water can split into three trains of treatment units. Each train consists of a Dissolved Air Flotation (DAF) Clarifier and a Granular Activated Carbon (GAC) filter.

Each DAF clarifier has two flocculation chambers, and then an area where air saturated recycled water is re-injected back into the water. The air bubbles in the saturated water bind with the flocculated particles and rise to the surface where it is scrapped off and pumped to the open lagoons. Clarified water flows to a combined trough before going to the GAC filters. Approximately 8-12% of this water is recycled back through the saturator and returned to the clarifier. The GAC filters each have 60 inches of GAC. Each filter requires periodic backwashes. Backwash water comes from a pump chamber off the clear well and sends the chlorinated water back through the filters. Following backwashing, a filter to waste process takes place. The backwashed and filter to waste water go to two spent washwater (SWW) basins. The solids in the backwash and filter to waste water settle in the SWW tanks. The clarified water is returned to the raw water vault ahead of the coagulation addition. VFD pumps pump the water at a rate less than 10% of the raw water entering the treatment facility. The water is monitored for flow and quality. Thickened solids from the DAF are discharged to one of two concrete lagoons, one in use while the other is being emptied. The lagoon has a decant recycle pump and a thickened solids pump. The decant pump returns the recycled flow to the inlet of the SWW tank and the solids pump pumps the solids to an on-site drying bed.

SECTION 5.3.2 – GODFREY BROOK TREATMENT PLANT

Godfrey Brook Treatment Plant is located off South Cedar Street and receives water from the five Godfrey Brook Wells. The water undergoes packed tower aeration through two parallel aeration towers. The aeration process was designed to reduce carbon dioxide to make the water less corrosive. However, iron that may be present in the water is also oxidized in the process. Although a pumping test conducted in 1981 for these wells revealed no iron and manganese, these parameters are now present in the raw water. Consequently, the oxidized iron forms a precipitate, which adheres to the media in the aeration towers and potentially collects in the clear well. Chlorine, for disinfection, and potassium hydroxide, for additional pH adjustment, are injected into the water as the water enters the 0.05 MG clearwell from the aeration towers. Two vertical turbine pumps are available to boost the water from the clearwell into the distribution system. The water is injected with zinc orthophosphate, for corrosion control, before entering the distribution system. The treatment plant is designed for 1.44 MGD; however, well yield has decreased over time, even with annual cleaning, therefore only one aeration tower is in use at any one time. This effectively reduces the plant capacity to about 0.72 MGD. The facility is equipped with switches and a connection for a portable generator for emergency power.

SECTION 5.4 – WATER DISTRIBUTION SYSTEM

SECTION 5.4.1 – SERVICE AREAS

The existing water system consists of two service areas, the Low Service Area and the High Service Area, separated by a series of isolation valves. The Low Service Area has a hydraulic grade line (HGL) elevation of approximately 525 feet above Mean Sea Level (MSL). All elevations in this report are above MSL. Ground elevations range from approximately 245 feet to 445 feet. The Low Service Area constitutes approximately 70 percent of the overall system demand. The High Service Area has a HGL of

approximately 640 feet. Ground elevations range from approximately 295 feet to 560 feet. The High Service Area constitutes approximately 30 percent of the overall demand.

SECTION 5.4.2 – DISTRIBUTION SYSTEM

The MWC water distribution system consists of approximately 130 miles of water main ranging in size from two to 24-inches in diameter. The water mains are constructed primarily from five common materials. Approximately 35 percent is cement lined ductile iron (CLDI) pipe, 28 percent is cast iron (CI) pipe, 28 percent is asbestos cement (AC) pipe, 8 percent is plastic or polyvinyl chloride (PVC) pipe, and the remaining one percent is galvanized steel or copper pipe.

SECTION 5.4.3 – WATER STORAGE FACILITIES

The MWC water distribution system includes three water storage facilities: the Bear Hill and Congress Street Tanks in the Low Service Area, and the Highland Street Tank in the High Service Area.

SECTION 5.4.3.1 – Bear Hill Tank

The Bear Hill Tank is located off Bear Hill Road. The welded steel tank was constructed in 1987 and has a capacity of approximately 2.65 million gallons (mg). The tank has a diameter of approximately 50 feet and a height of approximately 95 feet. The tank was constructed to an overflow elevation of approximately 525 feet and has a base elevation of approximately 430 feet. The interior and exterior of the tank was inspected in 2005 and the interior and exterior of the tank was blasted and painted in 2006.

SECTION 5.4.3.2 – Congress Street Tank

The Congress Street Tank is located off Congress Street. The Congress Street Tank was constructed in 1925 and has a capacity of approximately 1.1 mg. The tank has a

diameter of approximately 48 feet and a height of approximately 84 feet. The tank was constructed to an overflow elevation of approximately 525 feet and has a base elevation of approximately 441 feet. The interior of the tank was inspected in December 2009. As part of the Administrative Consent Order (ACOPCE-09-5D007-EMS, SEP) resulting from the August 2009 boil water order, the MWC was required to repair or replace the Congress Street Tank roof and perform repairs on the tank. These repairs included the incorporation of a mixing system and anchor system. The MWC has since complied with the ACO.

SECTION 5.4.3.3 – Highland Street Tank

The Highland Street Tank is located off Highland Street. The welded steel tank was constructed in 1964 and has a capacity of approximately 0.271 mg. The tank has a diameter of 24 feet and a height of 80 feet. The tank was constructed to an overflow elevation of approximately 640 feet and has a base elevation of approximately 560 feet. The interior and exterior of the tank was inspected in 2006. The tank inspection report recommends tank rehabilitation including blasting and painting of the interior and exterior of the tank and some structural modifications and site work. As of the date of this report, MWC has not completed the rehabilitation work.

SECTION 5.4.4 – Booster Pump Station

The High Service Area is served by the Congress Street Booster Pump Station (BPS), the only booster pump station in the distribution system. The station utilizes two 800 gpm pumps.

SECTION 5.4.5- INTERCONNECTIONS

MWC maintains five interconnections with four neighboring Towns. There are two interconnections with the Town of Hopedale, one at the end of Williams Street and the other at the end of South Main Street. Prior to August 2011, MWC continuously

supplied water to the Town of Hopedale. In 2011, Hopedale developed its own sources of water and discontinued its supply arrangement with MWC. There is an interconnection with the Town of Bellingham at the end of Beaver Street and an interconnection with the Town of Holliston at the end of East Main Street. Water can be both sold to and purchased from Bellingham and Holliston when necessary. The interconnection with the Town of Medway is at the end of Route 109 (Medway Road).

SECTION 5.5 – Water Supply Evaluation

SECTION 5.5.1 – GENERAL

In accordance with Massachusetts Department of Environmental Protection (MassDEP) requirements, the supply sources of a water system must be capable of meeting existing and projected maximum day demand (MDD) conditions and existing and projected average day demand (ADD) and summer average day demand (SADD) conditions with the largest source out of service. In this section, existing demand conditions were considered and demand projections completed by the Massachusetts Department of Conservation and Recreation (DCR) were summarized and considered. The safe yields of the supplies and permitted withdrawals of the existing supply sources were compared to current and future demand conditions.

SECTION 5.5.2 – Water System Demands

The DCR follows specific guidelines when projecting the water usage for communities in conjunction with the MassDEP Water Management Act (WMA). These guidelines incorporate trends in the use of water conservation devices in homes and industry, and emphasize the importance of monitoring the distribution system through water audits and leak detection surveys to reduce unaccounted-for water. It is important to note that the DCR has a key role in the water management approval process. Water demand projections through the year 2028 were completed for the MWC by the DCR in November 2008 as part of the WMA permitting process. Any alternative demand

projections must be approved by the DCR before the MassDEP will approve development of a new water supply source or authorize the withdrawal of additional volume from existing sources. Based on recent developments, the Massachusetts Water Resource Commission (MWRC) has adopted new Water Management Standards for all registered and permitted withdrawals. The policy includes performance standards and conditions for all registered and permitted public water suppliers in the following areas:

- Maximum residential consumption of 65 gallons per capita per day (gpcd)
- Maximum of 10 percent unaccounted-for water

Section 5.5.3 – Residential Consumption

Residential consumption is calculated by dividing water supplied to residential connections by the reported population. The MassDEP has developed standards for all Public Water Suppliers to meet 65 gpcd. Public Water Suppliers currently meeting 65 gpcd will be required to develop a Seasonal Demand Management Plan to manage non-essential outdoor water usage. Public Water Suppliers who have not consistently met the 65 gpcd will be required to develop and implement MassDEP approved Compliance Plans including the use of Best Management Practices to meet the residential consumption standard. The 2005 through 2009 Annual Statistical Reports indicate an average residential consumption of approximately 66 gpcd for the MWC system.

Section 5.5.4 – Unaccounted-For Water

Unaccounted-for water consists of unmetered water used for street cleaning, water main flushing, meter inaccuracy, unauthorized water uses, firefighting and leakage in the distribution system. This term is typically expressed as a percentage of the total water supplied to the system. Unaccounted-for water can be estimated by taking the difference between the total amount of water supplied and the total water billed and

dividing by the total water supplied. Unaccounted-for water percentages in the MWC system have averaged approximately 15 percent over the past five years.

Section 5.5.5 – Average Day Demand

Average day demand (ADD) is the total water supplied to a community in one year divided by 365 days. This term is commonly expressed in millions of gallons per day (mgd). This demand includes all water used for domestic (residential), commercial, industrial, agricultural, and municipal purposes. The municipal component includes water used for system maintenance such as hydrant flushing and fire flows. In addition, the ADD includes unaccounted-for water attributed to unmetered water uses and system leakage. According to the 2005 through 2009 Annual Statistical Reports (ASRs), the ADD for the MWC system ranged from 2.72 mgd to 3.18 mgd. More recently, as indicated above, the ADD in both 2011 and 2012 was approximately 2.60 mgd. Non-residential usage represents approximately 25 percent of the ADD. DCR used the following criteria to develop the 2028 ADD:

- Residential consumption of 65 gpcd
- Year 2028 service population of 29,643
- Year 2028 non-residential consumption of approximately 365 million gallons per year (mgd)
- Maximum of 10 percent unaccounted for water

DCR estimated demand projections for five year time blocks from 2013 to 2028. The 2028 ADD is approximately 3.27 mgd. DCR also increases the volume of the last five year time block by five percent to accommodate uncertainty in growth projections. The 2028 ADD with the five percent buffer is approximately 3.47 mgd. The DCR demand projections were projected to the design year 2030. The 2030 ADD with the five percent buffer is approximately 3.47 mgd.

Section 5.5.6 – Maximum Day Demand

Maximum day demand (MDD) is the maximum one-day (24-hour) total quantity of water supplied during a one-year period. This term is typically expressed in mgd. The MDD for MWC is 5.18 mgd.

Section 5.5.7 – Peak Hour Demand

Peak hour demand is the maximum total quantity of water supplied in a single hour over a one year period typically expressed in mgd. These demands are typically met by distribution water storage facilities.

Based on the available withdrawal rates, the total available maximum withdrawal volume is 3.07 mgd. Based on the existing MDD, there is an existing supply deficit of approximately 2.11 mgd [5.18 mgd (MDD) – 3.07 mgd (max. withdrawal volume)].

Based on the 2030 MDD, there would be a supply deficit of approximately 3.58 mgd [6.65 mgd (MDD) – 3.07 mgd (max. withdrawal volume)].

SECTION 5.6 - ADEQUACY OF EXISTING STORAGE FACILITIES

Distribution storage is provided to meet peak consumer demands such as peak hour demands and to provide a reserve for firefighting. Storage also serves to provide an emergency supply in case of temporary breakdown of pumping facilities, or for pressure regulation during periods of fluctuating demand. There are three components that must be considered when evaluating storage requirements. These components include equalization, fire flow requirements, and emergency storage. Equalization storage provides water from the tanks during peak hourly demands in the system. Typically, this quantity is a percentage of the maximum day demands. The fire flow storage component is based on the basic fire flow requirement multiplied by the required duration of the flow. The emergency storage component is typically equivalent to an ADD. However, if there is emergency power available at the sources, capable of

supplying at least an ADD, the emergency storage component can be waived. The only emergency power is available at the Dilla Street WTF.

The three components of the storage evaluation were calculated under current and future demand conditions for the LSA and HSA. Based on 2009 pumping and usage data, the LSA used an average of 70 percent of the total water pumped. The HSA used an average of 30 percent of the total water pumped. The current and future demands for each service area were calculated using 70 percent in the LSA and 30 percent in the HSA. Because the only emergency power is available at the Dilla Street WTF, the emergency storage component for the LSA is equivalent to the LSA ADD minus the 1.47 mgd available from the surface water supplies. Because the Congress Street BPS does not have emergency power, the emergency storage component for the HSA is equivalent to the HSA ADD.

Section 5.6.1 – Low Service Area

The three components of storage evaluation for the low service area are computed as follows:

1. Equalization

- Midsized system = 20 percent of the Maximum Day Demand
- LSA Maximum Day Demand in year 2009 = 3.63 mgd
- LSA Estimated Maximum Day Demand in year 2030 = 4.66 mgd
- Equalization (2009) = $0.20 \times 3.63 = 0.73$ million gallons (mg)
- Equalization (2030) = $0.20 \times 4.66 = 0.93$ mg

2. Basic Fire Flow Requirement

- Representative fire flow for MWC = 2,500 gpm
- Duration of 2 hours or 120 minutes
- Basic Fire Flow Requirement = $2,500 \text{ gpm} \times 120 \text{ min} = 0.30$ mg

3. Emergency

- LSA Average Day Demand in year 2009 = 1.90 mg

- LSA Estimated Average Day Demand in year 2030 = 2.43 mg
- Emergency (2009) = $1.90 - 1.57 = 0.33$ mg
- Emergency (2030) = $2.43 - 1.57 = 0.86$ mg

The total required storage for any given year is the equalization component plus the basic fire flow requirement. Therefore, the estimated current and projected (year 2030) total required storage for the LSA is as follows:

- Total LSA Required Storage (current) = $0.73 + 0.30 + 0.33 = 1.36$ mg
- Total LSA Required Storage (2030) = $0.93 + 0.30 + 0.86 = 2.09$ mg

Section 5.6.2 – High Service Area

The three components of storage evaluation for the high service area are computed as follows:

1. Equalization

- Midsize system = 20 percent of the Maximum Day Demand
- HSA Maximum Day Demand (currently) = 1.55 mgd
- HSA Estimated Maximum Day Demand in year 2030 = 2.00 mgd
- Equalization (currently) = $0.20 \times 1.55 = 0.31$ mg
- Equalization (2030) = $0.20 \times 2.00 = 0.40$ mg

2. Basic Fire Flow Requirement

- Representative fire flow for MWC = 2,500 gpm
- Duration of 2 hours or 120 minutes
- Basic Fire Flow Requirement = $2,500 \text{ gpm} \times 120 \text{ min} = 0.30$ mg

3. Emergency

- HSA Average Day Demand currently = 0.82 mg
- HSA Estimated Average Day Demand in year 2030 = 1.04 mg

The total required storage for any given year is the equalization component plus the basic fire flow requirement plus the emergency component. Therefore, the current estimate and projected (year 2030) total required storage for the HSA is as follows:

- Total HSA Required Storage (2009) = $0.31 + 0.30 + 0.82 = 1.43$ mg
- Total HSA Required Storage (2030) = $0.40 + 0.30 + 1.04 = 1.74$ mg

Under existing and projected ADD, MDD and peak hour demands, a minimum pressure of 20 psi should be maintained throughout the distribution system. The highest customer in the Low Service Area is at an elevation of approximately 430 feet above MSL. The Congress Street Tank and the Bear Hill Tank control the grade line in the LSA. In order to maintain a pressure of 20 psi in the LSA, the tanks can drop to an elevation of approximately 476 feet above MSL. Based on this scenario, there is approximately 0.72 mg of usable storage in the Bear Hill Tank and approximately 0.66 mg of usable storage in the Congress Street Tank. The total usable storage in the LSA is approximately 1.38 mg.

The total projected required storage for the design year in the LSA is approximately 2.09 mg. The MWC will have an estimated LSA storage deficit of 0.71 mg. If emergency power was available at all of the groundwater sources, the MWC would have approximately 0.15 mg of surplus storage in the LSA.

The highest customer in the High Service Area is at an elevation of approximately 561 feet above MSL. The Highland Street Tank controls the grade line in the HSA. In order to maintain a pressure of 20 psi in the HSA, the tank can drop to an elevation of approximately 607 feet above MSL. Based on this scenario, there is approximately 0.11 mg of usable storage in the Highland Street Tank.

The total projected required storage for the design year in the HSA is approximately 1.74 mg. Therefore, the MWC will have approximately 1.63 mg of storage deficit in the HSA. If emergency power was available at the Congress Street BPS, the emergency component would be waived. In this case, the total projected effective storage required for the design year in the HAS would be 0.59 mg. The required effective storage volume

could be reduced if additional pumping capacity was added to the Congress Street Booster Pump Station to provide required fire flows.

SECTION 5.7 - RECOMMENDATIONS AND CONCLUSIONS

Section 5.7.1 – Basis of Analyses

This section summarizes the findings of MWC's Consulting Engineer and presents their prioritized plan for recommended improvements and associated costs. The prioritization of improvements allows for constructing the necessary improvements over an extended period of time as funds allow.

Costs are based on the December 2010 Engineering News Record (ENR) construction cost index for Boston, MA of 11590.38, and include a 25 percent allowance for engineering and contingencies and costs associated with water services, hydrants and permanent and temporary trench pavement. Estimates do not include costs for land acquisition, easement or legal fees.

The capital improvement projects considered by this study will provide a direct benefit to the overall level of service to the MWC customers, reduce operation and maintenance cost by reducing the frequency of water main failures and the damage they cause, as well as improve fire protection to the homeowners and businesses in the Community.

Rehabilitation or replacement of one percent of a system each year (a 100 year replacement cycle) is a reasonable guideline based on industry experience and analysis. For the MWC distribution system, this would equate to approximately 6,800 linear feet of water main replacement each year as a guideline. Regular rehabilitation of water mains reduces main failures, leakage and water quality issues. Water main rehabilitation can also provide socioeconomic benefits by reducing operational costs associated with chemical and energy usage. Also, rehabilitation or replacement of

water mains that are inadequately sized to provide needed fire protection will improve public safety.

Section 5.7.2 – General Recommendations

In order to establish a comprehensive database of the condition of the system, it is recommended that the MWC create a water main failure database. Currently the MWC does not maintain written records of water main breaks. The database should include the location of each break recorded with the nearest street address and the properties of the failed main such as diameter, material, joint type, and type of lining. In addition, the MWC should record the type of failure such as ring crack, lateral split, hole in the pipe, “punky” AC pipe failure, or joint leak. If possible, the MWC should include the apparent cause of the failure such as frost load, traffic load, direct contractor damage, settlement, water hammer, external soil corrosion or stray current. This data should then be inputted into the hydraulic model to create a Water Main Failure Map to aid in identifying future problem areas. The map can be used to easily identify break locations and determine if any streets or areas have a higher frequency of failures and to view any patterns in the location of type of failure. The water main failure database will aid the MWC in making water main replacement decisions in the future.

In addition, it is recommended that the MWC create a database of new or replacement water mains. The database should include water main diameter, material, lining, joint type, soil conditions, date of installation, and as-built schematic drawings. This data can be added to the existing database, created for this study, to maintain a comprehensive water main database.

It is recommended that prior to installation of all new ductile iron water mains, the MWC test the soils in the area of the new main to determine if it has high corrosion potential. If the soil is found to be potentially corrosive, the MWC should consider wrapping the main with polyethylene to protect against external corrosion. Wrapping is a relatively inexpensive practice that can extend the life of new ductile iron pipe. In

addition, wrapping helps to protect the pipe from stray currents that may develop near the main.

Section 5.7.3 – Prioritization of Improvements

Based on the Three Circles Approach (an industry standard method of planning for future capital improvements), a prioritized list of improvements was created. Improvements were separated into three phases. The Phase I and Phase II Improvements are prioritized based on hydraulic needs, location in the distribution system and the condition of the water main. Phase I Improvements have been organized into two categories, storage and supply recommendations and water distribution system improvements. In general, the Phase I Improvements for the water distribution system include water mains that fall in the highest priority category for Renewal and Replacement (R&R). Phase II Improvements include water mains that fall into an intermediate priority level of R&R. These improvements strengthen the transmission grid, eliminate potential asset management concerns and provide redundancy. In order to estimate customer impacts with Town ownership of the system and to make fair comparisons with continued private ownership, funding of Phase I and II recommended improvements are included in the projections of total costs of service under both current private ownership and the public acquisition option in Section 9. Phase III Improvements fall in the lowest priority category. Phase III Improvements should be completed as funds become available and considered when reviewing road paving schedules. Because of the nature of these improvements, Phase III improvements are not included in the analysis comparing the revenue requirement of continuing private ownership versus the public ownership option.

It should be noted that due to the nature of this Master Plan and Capital Improvements Plan, the list of improvements is extensive. This results in a high associated cost if all of the suggested improvements were constructed. The intent of the prioritization, therefore, is to serve as a guide for implementation from the most needed to the least

needed improvements based on the weighted criteria established jointly by the MWC and Tata & Howard. These improvements would most logically be constructed over an extended period of time.

Section 5.7.3.1 – Phase I Improvements: Storage and Supply

As described above, the MWC has an existing supply deficit of approximately 2.11 mgd and a projected supply deficit of 3.58 mg. The supply deficit is based on the available withdrawal rates from the surface and groundwater supply sources. It is recommended that the MWC pursue Louisa Lake as an active water supply source. A firm yield study must be completed to use Louisa Lake as an active supply source. The estimated cost of the firm yield study and additional permitting is approximately \$50,000.

According to the MWC, the pumping capacity of the Godfrey Wells and the Dilla Street Wells has decreased. The MWC can pump approximately 65 percent of the approved withdrawal volume for the Godfrey Brook Wells and approximately 30 percent of the approved withdrawal volume for the Dilla Street Wells. These wells should be rehabilitated and/or replacement wells should be installed so the MWC can maximize existing sources. The estimated probable construction cost to rehabilitate a well is approximately \$20,000 per well. The estimated cost for a test well exploration program at one site is approximately \$20,000.

As discussed in Section 5.6, there is a projected storage deficit of approximately 0.71 mg in the LSA and 1.63 mg in the HSA. If emergency generators were installed at the groundwater supplies and the Congress Street BPS, there would be surplus storage in the LSA and a project storage deficit of approximately 0.70 mg in the HSA. The MWC should purchase two portable emergency generators that can be truck mounted and taken to the well sites or BPS in an emergency situation. The well sites and the BPS should be equipped with an exterior portable generator outlet for connection to the emergency generator when necessary. The estimated cost for two portable generators

along with the modifications at the stations for connection to the generator is approximately \$120,000.

As discussed in Section 5.6, the projected required effective storage in the HSA is 0.59 mg. A new water storage tank is recommended in the HSA. The estimated probable construction cost the water storage tank is \$600,000. This estimate includes the tank, foundation, limited water main installation and engineering and contingencies. This cost does not include costs associated with land acquisition, legal or site work. The required effective storage volume could be reduced if the pumping capacity at the Congress Street Booster Pump Station was increased to provide additional inherent fire flows.

According to the 2006 tank inspection report, the Highland Street Tank should be rehabilitated, including blasting and painting of the interior and exterior of the tank and some structural modifications and site work. The estimated probable construction cost of rehabilitating the Highland Street Tank is approximately \$300,000.

Due to water quality problems that resulted in a Boil Order in August 2009, it is recommended that the MWC complete a system-wide unidirectional flushing program twice a year. A unidirectional flushing program starts at a point of origin, usually a source or tank, and works outward flushing each portion of water main through clean water mains. The costs associated with developing a unidirectional flushing program is approximately \$22,000.

Section 5.7.3.2 - Phase I Improvements –Water Distribution System

The existing water main on Central Street from Depot Street to Main Street and on Main Street between Central Street and South Bow Street should be replaced with 12-inch diameter ductile iron water main. This improvement will improve transmission from the Bear Hill Tank to the center of Town and provide the inherent capacity to meet the representative fire flow at the Milford Regional Medical Center and the Dana Farber

Cancer Institute and Women's Cancer Center. The estimated probable construction cost of approximately 2,100 linear feet of 12-inch diameter water main is \$454,000.

The portion of the HSA along Purchase Street cannot meet the recommended residential fire flow requirement. To meet the recommended residential fire flow, the water main on Purchase Street would need to be cleaned and lined from the HSA to Tanglewood Drive. The estimated probable construction cost of cleaning and lining approximately 6,300 linear feet of 8-inch diameter water main is \$749,000. Prior to implementing this improvement, pipe coupons should be taken from the water main to confirm the poor interior condition of the water main.

In order to provide the inherent capacity for the ISO recommended fire flow on South Main Street at Courtland Street, the existing water main should be cleaned and lined from Depot Street to the end. Based on the poor condition of the water main, it is recommended that the water main be replaced with 12-inch diameter ductile iron water main. The estimated probable construction cost of approximately 2,300 linear feet of 12-inch diameter water main is \$496,000.

To provide the estimated needed fire flow at the intersection of Spruce Street and School Street, a new 12-inch diameter water main is needed on School Street from Main Street to Spruce Street. The estimated probable construction cost of approximately 1,550 linear feet of 12-inch diameter water main is \$335,000.

Section 5.7.3.3 - Phase II Improvements

Phase II Improvements consist of 15 major replacement main projects, five of which consist of two to seven separate pipe sections. Phase II will not be started until Phase I projects are completed or nearly completed, and will be spread out over several years. The first project could start as early as 2018, but could be delayed a few more years. Most of these projects will be started and completed in the 2020s and perhaps into the

early 2030s. The total cost of these projects in 2014 dollars is estimated at approximately \$7,100,000.

Section 5.7.3.4 – Phase III Improvements

Because of their long lead times and non-criticality, it is expected that Phase III Improvements will have little or no significant impact relative to the feasibility of this acquisition. Therefore, their costs and funding levels were not included in this analysis, presented in Section 9.

Section 6 – Estimated Acquisition Price

SECTION 6.1 – INTRODUCTION

This section describes the analysis performed to estimate the Purchase Price (PP) of acquiring all of the water system assets in the Town of Milford owned by Milford Water Company. This estimate is critical to the decision facing the Town in that its magnitude is likely to be the predominant factor in the evaluation. This estimate is a key input to the financial forecast model used to evaluate the Town's projected cost of owning and operating the water system. Based on the likely acquisition price and the financing options available to the Town for funding the acquisition and potential improvements, the annual debt service requirements are also estimated in this section. It was determined early in the analysis that the preferred financing options would be traditional municipal general obligation bonds.

Section 6.2 – Impact of Legal Counsel Analysis

As stated in its enabling legislation and further confirmed by Special Counsel in Section 3, "The Town of Milford shall have the right at any time during the continuance of the charter hereby granted, to purchase the corporate property and all rights and privileges of said company at a price that may mutually be agreed upon between said corporation and the said Town of Milford: and said corporation is authorized to make sale of the same to said town. If the parties cannot agree on a price, and either party petitions the SJC, the authority to set the purchase price will be delegated to the Commissioners of the Massachusetts Department of Public Utilities (MDPU or the Department)."

As indicated in Section 3, it is likely that the MDPU will require the Town to purchase some or all of the assets listed by Brown Rudnick. These assets are comprised of physical property and intangible assets. Physical assets are extensively described in Section 5. Intangible assets include such things as goodwill and franchise rights. However, the physical assets are very likely to comprise a very large portion of the price

determined by the Department. Furthermore, unless the Company's outstanding debt is more than the book value (original cost less accumulated depreciation – which is probably the minimum purchase price that the Commission would allow), it is very unlikely that the Commission would add an amount to their approved purchase price (PP) that would compensate the Company for any of its outstanding debt. Thus, the key issue to be determined by the Department is the value that they will assess the Company's assets at, and hence the PP the Town will have to pay the Company to acquire those assets.

Furthermore, as pointed out by Special Counsel, and as summarized in Section 3, the likely range of purchase prices that the Department would consider approving is bounded on the low end by the Original Cost Less Depreciation (OCLD) value, and on the high end by the Reproduction Cost New Less Depreciation (RCNLD) value. Thus, to be conservative we will estimate a likely range of values centered on the mid-range value of these two extremes. The mid-range value will be used in our analysis to establish a Base Case (a likely scenario based on likely estimates of key input variables). Two sensitivity cases will be evaluated using estimates of the PP significantly greater than and significantly less than the mid-range value. The case with the lower PP estimate will be based on the value half way between the OCLD value and the mid-range value. The case with the higher PP estimate will be based on the value half way between the mid-range value and the RCNLD value. We also note that while the range between OCLD and RCNLD for many utilities is fairly large, the range in this case is relatively small because MWC recently commissioned a new water treatment plant that effectively doubled its total value of plant in service. Thus, approximately half of its current plant assets have almost the same value under both the OCLD and the RCNLD methods of determining value.

SECTION 6.3 – CALCULATION OF ORIGINAL COST LESS DEPRECIATION (OCLD)

Starting with the low end of the range of possible values, the OCLD value is relatively easy to determine and not subject to interpretation, and hence not subject to wide variances in value. In fact this value as of the end of 2013 was determined by the Department (MDPU Docket No. 12-86) to be equal to \$36,063,386 (including CIAC). This value is comprised of the total plant in service at the end of FY2012 (including Land), plus the pro-forma additions for the New Water Treatment Plant (NWTP) of \$20,839,558 and two new water mains in School Street and Church Street that total to \$572,604, plus adjustments for retired treatment facilities, and accumulated depreciation adjustments for CIAC and major plant additions. Taking out the original cost of contributed plant (CIAC – Contributions In Aid of Construction), which is paid for by new customers at zero cost to the Company, results in the following net (or Invested) OCLD:

Invested OCLD (Incl. NWTP) = (Adjusted Total Plant in Service – CIAC) – (Total Depreciation Reserve – Accumulated Depreciation on CIAC)

$$= (\$46,580,577 - \$6,567,847) - (\$10,517,191 - \$2,267,228)$$

$$= (\$40,012,730) - (\$8,249,963)$$

$$= \underline{\underline{\$31,762,767}}$$

Invested OC (Excl. NWTP) = (Adjusted Total Plant in Service – OC (NWTP)) – (CIAC)

$$= (\$46,580,577 - \$20,839,558) - (\$6,567,847)$$

$$= (\$25,741,019) - (\$6,567,847)$$

$$= \underline{\underline{\$19,173,172}}$$

To the extent the Department relies on the OCLD approach to value, it should use the Invested OCLD value as it excludes plant that the Company did not pay for (zero cost to MWC).

SECTION 6.4 - CALCULATION OF REPRODUCTION COST NEW LESS DEPRECIATION (RCNLD)

Turning to the high end of the range, RCNLD is considerably more difficult to estimate and more subjective in nature. However, as pointed out above, because the Company just last year more than doubled the value of its assets, now over half of the Company's RCNLD value is nearly identical under either method. Due to this fact, the level of variance in the Company's value using the RCNLD method is relatively small as compared to most utilities with a preponderance of older assets. Therefore, in this case we only need to determine the RCNLD value of this Company's assets excluding the value of its NWTP. To this value (RCNLD of all assets excluding the NWTP), we would simply add the cost of the NWTP. The OC of the NWTP is \$20,839,558 and the RCNLD is the OC with one year of price escalation less one year of depreciation. In this case one cancels out the other because appreciation is about the same as the one year of depreciation. This leaves the OCLD value of this asset nearly identical to its RCNLD value. Thus, for purposes of this analysis the RCNLD value of the NWTP will be set at \$20,839,558.

The RCNLD value of the remaining assets will be estimated using two methods. Each is based on a recent appraisal of a comparable water utility in a neighboring State. Because that appraisal was very recent and the assets involved were very similar in nature and age, certain ratios derived from that appraisal could be appropriately applied to comparable cost and age levels specific to assets of the MWC. The first method starts with an estimate of the RCN of MWC's remaining assets by simply applying the ratio of the RCN divided by the OC of the Comparable Utility (CU) times the OC of MWC's remaining facilities. This results in the following estimate:

$$\begin{aligned} RCN (MWC) &= [RCN (CU) / OC (CU)] * Invested OC (Excl. NWTP) \\ &= [\$69,442,756 / (\$22,805,826)] * (\$19,173,172) \\ &= (3.045) * (\$19,173,172) \\ &= \underline{\underline{\$58,382,309}} \end{aligned}$$

This estimate needs two adjustments to compensate for the relative age and relative length of water mains for the two systems. The age adjustment is computed as follows (%Depreciation = Accumulated Depreciation/Invested OC):

$$RCN (MWC) (Adj. for age) = RCN (MWC) / \{1 - [(\% Depr. (MWC) - \% Depr. (CU))]\}$$

Where,

%Depr.(MWC) equals 51%, and %Depr.(CU) equals 34%

$$\begin{aligned} &= \$58,382,309 / \{1 - [0.51 - 0.34]\} \\ &= \$58,382,309 / \{1 - [0.17]\} \\ &= \$58,382,309 / (0.83) \\ &= \$70,340,131 \end{aligned}$$

The length adjustment is then applied, and is computed as follows (L = Length):

$$\begin{aligned} RCN (MWC) (Adj. for L) &= RCN (MWC) (Adj. for age) * (CU - L of pipe) / (MWC - L of pipe) \\ &= \$70,340,131 * (614,259 \text{ feet}) / (707,867 \text{ feet}) \\ &= \$70,340,131 * (0.87) \\ &= \underline{\underline{\$61,195,914}} \end{aligned}$$

The second method to estimating RCN (MWC) is derived by multiplying the RCN per foot of installed pipe for the comparable utility times the number of feet of pipe in MWC's system. These computations are summarized below:

$$\begin{aligned} RCN (MWC) &= [RCN (CU) / Feet of pipe (CU)] * (Feet of pipe (MWC)) \\ &= (\$69,422,756/707,867) * (614,259) \\ &= (\$98.07) * (614,259) \\ &= \$60,240,380 \end{aligned}$$

Because the two methods result in approximately the same estimated value for RCN (MWC) (\$61,195,914 and \$60,240,380), the average of the two will be used for this analysis. The average of the two estimates is \$60,718,147.

The next step is to subtract an estimate of the Depreciation to derive the RCNLD (MWC) value. The depreciation percentage is derived by dividing the current depreciation reserve by the invested OC plant. For MWC the percentage depreciation is 51%, and for the CU it is 34%. Thus, the estimated value of RCNLD (MWC) is computed as follows:

$$\begin{aligned}
 \text{RCNLD (MWC)} &= \text{RCN (MWC)} - \text{Depreciation} \\
 &= \text{RCN (MWC)} - (\text{RCN (MWC)} * \text{Percentage Depreciation}) \\
 &= \$60,718,147 - (\$60,718,147) * (0.51) \\
 &= \$60,718,147 - \$30,966,255 \\
 &= \underline{\underline{\$29,751,892}}
 \end{aligned}$$

This value is exclusive of the value of intangibles and the value of land included is at original cost, which is likely to be below its current fair value. Thus, two additional adjustments are needed. First, while intangibles may have significant value, collectively they are likely to be much smaller than the value of plant and equipment. Accordingly, only 1% of the RCNLD of the plant and equipment derived above will be assumed to approximate the total of all intangibles. Second, an adjustment will be made to reflect an increase in value of land midway between the OC and the assessed value. The current assessed value is a little over \$8 million and the OC is just under \$2 million. Thus, the adjustment for land is an increase to the RCNLD above of \$5 million [2 million + (\$8 million - \$2 million)/2]. Adding these 2 adjustments results in the estimate of MWC total RCNLD value as follows:

$$\begin{aligned}
 \text{Total RCNLD (MWC - Excl. NWTP)} &= \text{RCNLD (MWC - Above)} + \text{Intangibles Est. Value} + \\
 &\quad \text{Adj. Increased Land Value} \\
 &= \$29,752,000 + \$300,000 + \$5,000,000 \\
 &= \underline{\underline{\$35,051,892}}
 \end{aligned}$$

At this point, we have a reasonable estimate of the RCNLD value of all of MWC's assets except the RCNLD value of the NWTP, which as explained above has a RCNLD value almost exactly the same as its OCLD value. The Department in DPU 12-43 allowed a

total construction cost of this new plant of \$20,839,558, which due to the offsetting effects of price escalation and depreciation equals both the OCLD value and the RCNLD value of this major plant addition. Thus, the total RCNLD of all of MWC's assets is simply the sum of the RCNLD estimated for all plant excluding the NWTP plus the RCNLD of the NWTP, calculated as follows:

$$\begin{aligned} \text{Total MWC System RCNLD} &= \text{RCNLD (all Plant ex-NWTP)} + \text{RCNLD (NWTP)} \\ &= \$35,051,892 + \$20,839,558 \\ &= \underline{\$55,891,450} \\ &\text{or } (\$56 \text{ million rounded to the nearest million}) \end{aligned}$$

Thus, for the base case we will use the mid-point of the two methods of determining the Purchase Price:

$$\begin{aligned} \text{Estimated PP} &= \$31,762,767 + \$55,891,450 \\ &= \$87,654,217 / 2 \\ &= \underline{\$43,827,108} \\ &\text{or } (\$44 \text{ million rounded to the nearest million}) \end{aligned}$$

Because of the importance of the PP in the financial evaluation of the Town's decision to acquire this water system and the uncertainty associated with the RCNLD value, we recommend that the Town contract a qualified firm to perform a comprehensive appraisal of the RCNLD value of this water system before it takes a vote on whether it should acquire these assets. We also agree with Special Legal Counsel that the Town should, to the extent possible, petition the Department to ascertain the degree to which the Department would rely on estimates of the RCNLD value in determining the PP for this system versus use of the OCLD valuation, before the Town takes a vote on whether it should acquire the assets of the MWC. Lastly, to insure the Town is aware of the financial impact of the DPU Commissioners deciding that the PP should be based largely on the RCNLD value, a sensitivity case was added that assumed that the PP was equal to the value half way between the mid-range value (\$44,000,000) and the RCNLD value (\$56,000,000 - rounded to the nearest million).

SECTION 6.5 – PURCHASE PRICE IN RELATION TO RATE BASE

As a final check on this estimated PP, we also used the Company's rate base (RB) factored up using typical values for multiples of a company's RB resulting in prices paid for system assets. The RB for all plant and equipment (including the NWTP) serving the Town of Milford allowed by the MDPU in Docket MDPU 12-86 (as modified) was \$31,183,233. Many acquisitions of water systems resulting from eminent domain takings have generally been purchased at a price that is in excess of 1.5 times the rate base and usually do not exceed 2.0 times the RB. Thus, the normal range would indicate a likely price for the MWC's assets would be between \$46.8 million ($1.5 \times \text{RB(MWC)} = 1.5 \times \31.2 Mil) and \$62.4 million ($2 \times \text{RB(MWC)} = 2 \times \31.2 Mil). The midpoint value of this range is \$54,600,000, which is only about \$900,000 (1.6%) less than our estimate of this system's RCNLD (\$55,891,450) derived above. This further supports our estimate of RCNLD as being reasonable and not likely to be significantly different from a value determined from a comprehensive appraisal. Furthermore, it also supports our estimate that the PP is not likely to be significantly higher than our estimate of the RCNLD (about \$56 million).

SECTION 6.6 – ADJUSTMENTS TO THE PURCHASE PRICE ESTIMATE

As indicated in the previous section, a comprehensive evaluation of the water system's facilities was completed in late 2010 by Tata and Howard, Inc. If the Town is not satisfied with that Company's evaluation of any of the assets reviewed by that Company, it should take measures to have those facilities fully evaluated by another consulting engineer before a final determination is made to proceed with acquisition. Additionally, because three years have elapsed since completion of that study, the Town should have an engineering evaluation performed on any additions, betterments and retirements that have taken place since that study was completed. However, with respect to the NWTP it is very likely that this facility was designed and constructed with high standards and quality due to the level of scrutiny it received from the

Massachusetts Department of Environmental Protection (MDEP), the MDPU and Town Officials.

Before a final estimate of the Purchase Price can be precisely determined, the following information relative to changes in system assets must be taken into account:

- Any additions to Plant and Equipment after the date of the decision in MDPU 12-86 (exclusive of the posttest year additions allowed by the Department)
- Any betterments after the date of the decision in MDPU 12-86
- Any retirements after the date of the decision in MDPU 12-86 (exclusive of the retirements allowed by the Department in that Decision and Order)
- Any contributions (CIAC), grants, and other zero-cost plant additions after the date of the decision in MDPU 12-86

SECTION 7 - Funding the Cost of Acquisition and System Improvements

Section 7.1 - Debt Service Associated With Acquisition Costs

We have assumed that the funds needed for the system purchase will be provided from the issuance of new debt. These funds (\$44.66 million) will be provided from General Obligation Bonds (G. O. Bonds) with equal principal payments (declining total payments) at an interest rate of 3.5%. In order to determine the bond size an amount was added to the purchase price that allows for consulting costs associated with the process of evaluating the acquisition and issuance of debt along with standard issuance costs for a total markup of 1.5%. The annual payments of debt service for this debt are shown on Schedule 7.1.

The Town's Treasurer was consulted relative to all of the estimated parameters used in sizing and pricing this bond issue. Please note that while these assumptions may be valid in today's markets, those conditions are likely to change over time. As long as the changes are in the direction of lowering interest rates, our recommendations would not be affected. However, any significant increase in interest rates could affect our conclusions and recommendations, and if large enough, could result in reversals of certain recommended measures. Because of the preponderance of G.O. debt and the associated requirement of level principal payments, the net effect is a skewed (higher) cost in the early years with significant decreases over the life of the bonds. This is the single most important factor leading to the ability of municipal ownership to maintain relatively constant total costs in the future as shown in the next section. It is also partly responsible for the large potential savings over continued private ownership in the future.

Schedule 7.1 Amortization Table for Utility Acquisition Bond

Term	Principal	Level Debt	Interest Rate		
30	\$44,660,000	\$1,488,667	3.5%		
Year	Principal Payment	Interest Payment	Total Payment	Beginning Balance	Ending Balance
1	\$1,488,667	\$1,563,100	\$3,051,767	\$44,660,000	\$43,171,333
2	\$1,488,667	\$1,510,997	\$2,999,663	\$43,171,333	\$41,682,667
3	\$1,488,667	\$1,458,893	\$2,947,560	\$41,682,667	\$40,194,000
4	\$1,488,667	\$1,406,790	\$2,895,457	\$40,194,000	\$38,705,333
5	\$1,488,667	\$1,354,687	\$2,843,353	\$38,705,333	\$37,216,667
6	\$1,488,667	\$1,302,583	\$2,791,250	\$37,216,667	\$35,728,000
7	\$1,488,667	\$1,250,480	\$2,739,147	\$35,728,000	\$34,239,333
8	\$1,488,667	\$1,198,377	\$2,687,043	\$34,239,333	\$32,750,667
9	\$1,488,667	\$1,146,273	\$2,634,940	\$32,750,667	\$31,262,000
10	\$1,488,667	\$1,094,170	\$2,582,837	\$31,262,000	\$29,773,333
11	\$1,488,667	\$1,042,067	\$2,530,733	\$29,773,333	\$28,284,667
12	\$1,488,667	\$989,963	\$2,478,630	\$28,284,667	\$26,796,000
13	\$1,488,667	\$937,860	\$2,426,527	\$26,796,000	\$25,307,333
14	\$1,488,667	\$885,757	\$2,374,423	\$25,307,333	\$23,818,667
15	\$1,488,667	\$833,653	\$2,322,320	\$23,818,667	\$22,330,000
16	\$1,488,667	\$781,550	\$2,270,217	\$22,330,000	\$20,841,333
17	\$1,488,667	\$729,447	\$2,218,113	\$20,841,333	\$19,352,667
18	\$1,488,667	\$677,343	\$2,166,010	\$19,352,667	\$17,864,000
19	\$1,488,667	\$625,240	\$2,113,907	\$17,864,000	\$16,375,333
20	\$1,488,667	\$573,137	\$2,061,803	\$16,375,333	\$14,886,667
21	\$1,488,667	\$521,033	\$2,009,700	\$14,886,667	\$13,398,000
22	\$1,488,667	\$468,930	\$1,957,597	\$13,398,000	\$11,909,333
23	\$1,488,667	\$416,827	\$1,905,493	\$11,909,333	\$10,420,667
24	\$1,488,667	\$364,723	\$1,853,390	\$10,420,667	\$8,932,000
25	\$1,488,667	\$312,620	\$1,801,287	\$8,932,000	\$7,443,333
26	\$1,488,667	\$260,517	\$1,749,183	\$7,443,333	\$5,954,667
27	\$1,488,667	\$208,413	\$1,697,080	\$5,954,667	\$4,466,000
28	\$1,488,667	\$156,310	\$1,644,977	\$4,466,000	\$2,977,333
29	\$1,488,667	\$104,207	\$1,592,873	\$2,977,333	\$1,488,667
30	\$1,488,667	\$52,103	\$1,540,770	\$1,488,667	\$0

Section 7.2 - Renewal and Replacement (R&R) Funding

The public sector must generate funds to renew and replace its capital facilities; in this respect there is no difference between the public and private sector. The reason is obvious—both governmental and private utilities rely on service and use charges for their revenues and accordingly both must include, in their rate structures, provisions for meeting basic facility needs.

While the basic purpose for the accumulation of reserves is the same, there are differences in the objectives sought by governmental and private utilities. The most significant of these is the differentiation between private sector “reserves for depreciation” and public-sector “renewal and replacement” funds. The former has a two-fold objective:

- Shelter revenues from income taxation, and
- Provide for recovery of the capital investment (in terms of the purchasing power of the invested dollar)

On the other hand, “renewal and replacement” funds, as used in the governmental utility context (where there are no income tax liabilities), have the following objectives:

- Provide financial resources for maintaining the fixed assets of the utility in an acceptable and continuously operable condition, and
- Ensure that financial resources are sufficient to effect the necessary replacements, particularly during emergency conditions or system failures at the time they are needed

For many utilities, system deterioration and obsolescence are becoming an increasing problem and corrections may require large new borrowing. This will become particularly acute in the future with the elimination of federal grants and a reduction in state funding. Renewal and replacement funds should be provided for annually and used to pay for needed system replacements and rehabilitation projects.

The theory of a renewal and replacement approach is thus predicated on the adoption of a “pay-as-you-go” plan for maintaining system operability. In any one year, the present day users would have incorporated within their rates a set amount for use in ensuring that the system can be renewed and replaced in a manner which makes it perpetually operable. In theory, these users would be transmitting property assets to future users which have, in terms of service life, value comparable to that which they inherited. The burden of maintaining this property value is thus shared equally rather than as a result of sudden massive facility deterioration on a disproportionate basis.

If the Town acquires the water system, it is recommended that the Town establish an R&R accounting and funding mechanism for the cash funding of many projects designed to renew, replace and extend the life of existing facilities.

A reasonable funding level for this system would be approximately 1.8% of the purchase price. For the first year of the forecast period this equates to approximately \$800,000 (1.8% of \$44.66 million). To account for annual capital improvements funded from current revenues this is increased by 2% each year thereafter. Additionally, the level should increase by the net change in depreciable assets associated with debt funded capital improvements. The model captures this by adding an increase to depreciation expense in 2018 the first year the major main replacements (Phase I) are expected to be in service, as well as the Phase II capital improvements between 2023 and 2025. If the level of funds provided becomes too high, the percentage factor could be adjusted downward over time.

These funds could be used to fund capital improvement projects on a pay-as-you-go basis from current revenues, or if necessary used to pay a portion of the debt service on larger projects requiring the use of borrowed funds. In either event, this level of funding should be sufficient for a system of this size over the short to mid-term (5 to 10 years), particularly in light of the fact the primary treatment plant is new and should (with proper maintenance) have a useful life of at least 20 years and perhaps as much as 30 years. To the extent this level of funds is not needed in a given year, the balance should

be added to an interest bearing capital reserve fund to be used in future years when greater levels are needed.

Section 7.3 - Additional Capital Improvements and Funding

Upon acquisition, the Town will need to plan for and implement several capital improvement projects in order to improve the core distribution system and increase both total system sources of supply and storage capacity in the high service area. These improvements were fully described in Section 5.

Phase I Improvements have been organized into two categories, storage and supply recommendations and water distribution system improvements. In general, the Phase I Improvements for the water distribution system include water mains that fall in the highest priority category for Renewal and Replacement (R&R). In current dollars, Phase I projects total about \$3 million. These projects should be started shortly after the acquisition is completed. To fund Phase I projects in the first three years (including planning, design and engineering), we recommend a combination of funds from the R&R account (pay-as-you-go funding) supplemented with funds from the issuance of two Bond Anticipation Notes (BANs) in 2016 and 2017, at \$250,000 and \$500,000, respectively. Beyond those first few years, we recommend the issuance of a bond issue to fund all Phase I projects in early 2018, with construction of all remaining Phase I projects to start within a few years thereafter. The bond size needed to fund Phase I requirements is about \$2.4 million with an assume interest rate of 4%. R&R funding will also be increased by a total of about \$48,000 when these projects are completed (starting around 2018).

Phase II Improvements were also prioritized based on hydraulic needs, location in the distribution system and the condition of the water main. Phase II Improvements include water mains that fall into an intermediate priority level of R&R. These improvements strengthen the transmission grid, eliminate potential asset management concerns and provide redundancy. Again, to get Phase II started the Town will likely fund these

projects in the early years through a combination of R&R funds and one or more BANs. Preliminary planning and design of these projects should begin in 2021 or 2022. Beyond those first few years, we recommend the issuance of a bond issue to fund all Phase II projects in early 2023, with construction of many of the remaining Phase II main improvement projects to start within three or four years thereafter. The bond size needed to fund Phase II requirements is expected to be about \$8 million, and the assumed interest rate is 4.5%. R&R funding will also be increased gradually to a total of about \$160,000 when all Phase II projects are completed (around 2025). As indicated previously, issuance costs for both loans are assumed to be 1.5% of the Principal amount needed.

Phase III Improvements fall in the lowest priority category. Phase III Improvements should be completed as funds become available and considered when reviewing road paving schedules. Because of the nature of these improvements and the fact that few if any will be completed prior to the end of the 20 year study (and comparison) period, Phase III improvements are not included in the analysis comparing the revenue requirements of continuing private ownership versus the public ownership option (Sections 9 and 10).

The Town's Treasurer was consulted relative to all of the estimated parameters used in sizing and pricing these two bond issues. Please note that while these assumptions may be valid in today's markets, those conditions are likely to change over time. As long as the changes are in the direction of lowering interest rates, our recommendations would not be affected. However, for these two bonds, even if there is a significant increase in interest rates the impact on the relative economics of the private case versus the public ownership and operation option will be relatively minor. This is the case for these two bond issues (unlike the bond used to purchase the system) because the same increases or decreases in costs will have about the same economic impacts to borrowing costs under either option. That is, if it costs the Town more to fund future capital costs because interest rates turn out to be much higher than expected, it would also have

cost the private utility more (proportionately) to fund those same future capital costs if the acquisition hadn't taken place.

SECTION 8 - OPERATIONS AND MAINTENANCE COSTS

Section 8.1 – Background

Total system costs for a municipal utility consist of two major categories – operating costs and capital costs. Total operating costs for a municipal utility are generally comprised of three components – direct Operations and Maintenance (O&M) costs, payments for Town services and any applicable taxes. Direct (O&M) costs include all labor and materials expenses incurred in the day-to-day operations and maintenance of all system facilities. Operating expenses include electricity, laboratory fees, chemicals and operating labor costs, for example. Maintenance expenses include equipment and leak repairs and maintenance labor costs. Additional O&M expenses include administrative and general expenses. Payments for Town services typically include charges for Town-owned assets and time spent by Town employees other than those directly associated with the utility. Examples include office space rental, billing and collections performed by the Treasurer's Office, and labor and equipment temporarily assigned for emergency assistance. In this case, Town services will be limited to amounts needed to compensate the Town for its labor and materials associated with all billing and collections functions. Taxes for a municipal utility can be in the form of direct payments to the General Fund and/or property taxes referred to as Payments-in-Lieu-of-Taxes (PILOT). As the name indicates, PILOT includes all payments to the Town for property taxes it would likely have incurred if it were privately owned.

The Town of Milford has tentatively determined, if the acquisition goes forward, to not require a direct contribution to the General fund in lieu of lost property taxes previously paid to the Town by MWC. Additionally, the Town will no longer receive payments from MWC for the raw water it supplied to the Company from Town-owned wells. As a compensating adjustment the Town will not be required to pay the Water Department for fire protection service. The net result of these offsetting charges and revenues will

likely be a slight gain to the Town. For calendar year 2014, the pro-forma impact to the Town (assuming the system was under municipal ownership), is estimated as follows:

Table 8-1 CY2014 Offsetting Charges, Net Result to Town

Lost Revenue from Property Taxes	(\$682,216)
Lost Revenue from sales of well water (Clark's Island)	(\$10,000)
Reduced Expenses for not paying Fire Protection Charges	\$802,000
Net Gain (rounded to nearest thousand)	\$110,000

For a fully self-sufficient utility, all of these revenue requirements or costs must be covered by or paid from all of its sources of revenues. In this case, aside from some minor miscellaneous sources and occasional grants, these are derived from rates charged for service provided to all customers, System Development Charges (SDCs), customer contributions and interest income. MWC currently receives approximately \$120,000 from these miscellaneous charges. In any given year, total costs may exceed (deficit) or be less than (surplus) all revenue sources. Relatively small over- or under-collections are allowed in a given year. However, over time, there must be a balancing of these total annual costs and revenues. Sizable under- or over-collections will need to be counter balanced with appropriate rate increases or decreases.

SECTION 8.2 - ESTIMATED OPERATIONS AND MAINTENANCE COSTS (O&M) UNDER MUNICIPAL OWNERSHIP

This section contains a summary of the approach and analysis used to estimate what it will cost the Town to operate and maintain the water system as a public entity. In essence, three different methods were considered in estimating the Town's total O&M costs. Because each method resulted in estimates that were fairly close, professional judgment was used in selecting an amount close to the average of the three. The three methods that were considered are listed below:

- Results of an American Water Works Association (AWWA) National Survey (2012)

- Computed unit O&M costs incurred by five water systems in communities similar to Milford
- Estimated costs for contracted O&M services provided by an outside vendor

In 2012, AWWA published a report covering operating data for a broad range of publicly owned (99 percent) and privately owned (1 percent) water utilities—nearly 300 in total. This publication is entitled *2012 Water and Wastewater Rate Survey*, and was co-produced by Raftelis Financial Consultants, Inc. In 2011, the average O&M costs for the Group C (the 101 smaller water utilities) was \$9.10 million and the average total water consumption was 3,205,000 thousand gallons. Thus, the average cost of O&M per 1,000 gallons sold was \$2.84 ($\$9,100,000/3,205,000$) for this group of comparable utilities. Escalating this by the average annual increase of 4% for three years brings the 2014 unit cost to \$3.19/1,000 gallons. As a reference, study figures for the two groups consisting of larger systems (Groups A and B) are \$1.99/1,000 gallons and \$2.21/1,000 gallons for Group A (the largest systems) and Group B (medium systems), respectively. Applying Group C's unit rate to the estimated consumption of 810 million gallons results in a total O&M cost estimate of \$2,584,000 for the subject system.

This unit cost was compared directly with five other systems in Massachusetts, to test its reasonableness as an indicator of how much the Town should expect to pay to operate and maintain the system with its own staff. We also contacted a regional company that provided an estimate of what it would cost the Town to hire a firm to operate and maintain the system (contract operations). This company provides contract operations services to several communities throughout New England (and is thus familiar with regional pricing differences).

In order to verify whether or not local circumstances were consistent with regional and national comparisons, we looked at the operation of five municipal water systems of similar size and customer bases. The five towns examined are Concord, Bellingham, Medfield, Millis and Shrewsbury. Table 8-2 provides a summary of each town's total O&M costs, total water delivered, and unit costs (total O&M costs/1,000 gallons) for

2012. These unit costs were then escalated two years to bring them to 2014 levels. These estimated 2014 unit costs are shown on Row 4 of Table 8-2. The weighted average O&M cost in 2014 of the five utilities in the sample was calculated at \$3.25/1,000 gallons sold. Applying this average unit rate to Milford's system estimated consumption in 2014 (810 million gallons) results in a total O&M cost estimate of \$2,633,000.

Table 8-2 Summary of O&M Costs in Five Towns

Description	Concord	Bellingham	Medfield	Millis	Shrewsbury
Total O&M Costs (Equivalent)	\$2,401,325	\$1,615,057	\$1,097,500	\$597,869	\$3,217,129
Total Water Delivered (Million Gallons)	766.5	514.7	327.4	199.3	1,334.0
O&M Cost/1,000 Gals. Delivered in 2012	\$3.13	\$3.14	\$3.35	\$3.00	\$2.41
Estimated O&M Cost/1,000 Gallons Delivered in 2014	\$3.39	\$3.40	\$3.62	\$3.25	\$2.61
Weighted Average of five utilities (2014): \$3.25/1,000 Gallons Sold					

From the national sample of Group C water systems, we also looked at 11 systems from the Northeast and computed the average cost of the nine remaining after two outliers were removed. The regional estimate derived from the national sample (with three years of escalation applied) was \$3.34/1,000 gallons sold. This figure is very close (3% higher) to the average of the five Massachusetts systems discussed above (\$3.25/1,000 gallons). This strongly indicates that a unit rate in this range provides a good (conservative) basis for estimating what level the Town can expect to pay for operating and maintaining the system with its own forces.

As a final check, we contacted a reputable engineering firm to provide an estimate of a likely range of fees that a private firm would charge to operate and maintain the system under a contract operations agreement. This firm has a subsidiary that provides these services, so they are well aware of the fees charged for such services. In their

professional opinion, it would cost the Town somewhere in the range of \$2.5 million to \$2.9 million annually to operate and maintain the Milford system. The actual cost would depend on the exact terms of the contract, insurance requirements, usage levels and the need to repair/replace infrastructure. This contract O&M service provider indicated that without more detailed information on the water system, their best estimate of the likely total cost is the midpoint of their estimated range (\$2.7 million). This includes all daily operations, normal and emergency repairs and replacements, and all management and control functions, except for the billing and collections process. This latter function would be the sole responsibility of the Town in addition to general oversight and executive management which must remain with the system owner. Therefore, with the contract operations option, the total comparable costs of O&M for Milford would be about \$2,700,000.

The total O&M cost estimates and equivalent unit costs derived from the three approaches described above are summarized in Table 8-3 below.

Table 8-3 Summary of Various Cost Approaches (TG = 1,000 Gallons)

Approach	Equivalent Unit Cost	Estimated Total O&M Cost
AWWA Survey	\$3.19/TG	\$2,584,000
Sample Water Systems (five)	\$3.25/TG	\$2,633,000
Contract Operations	\$3.33/TG	\$2,700,000
Average	\$3.26/TG	\$2,640,000

Because all three estimates are within 3% of the average cost it would be reasonable to use the average level for the base case. But again, to be conservative the highest of the three estimates will be used for the base case analysis. The selected level is \$2,700,000, which is only about \$60,000 (2.3%) higher than the average, and almost exactly the same as the average ($\$2,705,000 = (\$3.34/\text{TG}) \times 810,000 \text{ TG}$) of the 9 sample systems from the Northeast. This is also a conservative estimate in that the five utilities in the sample above probably have relatively high system costs because their rates are considerably higher than rates being charged by many other municipal water systems in

Massachusetts. Furthermore, the Town has the option of outsourcing this service through a contract operations arrangement, which is not likely to significantly exceed the average total cost derived from our analysis.

SECTION 8.3 - COMPARISON WITH PRIVATE OWNERSHIP

Because Milford Water Company is a utility subject to regulation by the Massachusetts Department of Public Utilities (MDPU), the level of total costs (total revenue requirements) are set by (or are approved by) that Department. In its recent rate case (MDPU 12-86), the Department allowed the Company to recover an approved level of O&M costs directly associated with the MWC water system in the pro-forma year (FY2014). This level as specified by line items and totaled on Schedule B (page 307) attached to the Order and Decision in that case as subsequently modified (page 8, MDPU 12-86-A) was \$2,849,178. The base case (described in the next section) projection of O&M costs under continued private ownership and operation are assumed to increase at an annual escalation rate of 5%, which is significantly lower, and hence more conservative for this study, than levels realized by the Company going back several years.

Thus, when compared to a reasonable estimate of what it would cost the Town to operate and maintain the system as a municipally owned water utility, the Company's O&M costs are in the order of \$300,000 (10%) higher and could be as much as \$500,000 (20%) higher. While this comparative analysis is not comprehensive or fully conclusive, it does strongly suggest that a municipally owned and operated water system in Milford could be operated and maintained at least as cost effectively as the private alternative.

An ongoing objective of all utilities should be the minimization of all operating costs in both the short run and the long run. This is particularly true in the long run as capital improvements are added to meet the needs of both existing and new customers. From our analysis, it appears that the Company has not been very effective in keeping its short run costs down in recent years. When compared with a representative sample of utilities with very similar operational characteristics and system loads, they are near or at the high

end of system operating costs. The Company's total O&M costs on a unit basis (\$3.63/TG) are considerably higher than those reported by most of the water utilities in the sample. This finding is based on industry surveys of both privately owned and publicly owned systems (\$3.19/TG), and direct comparisons with five local water systems (\$3.25/TG).

SECTION 9 – Total Revenue Requirements and Rate Impacts

SECTION 9.1 – OVERVIEW

In this section we present the total estimated costs of providing water service under municipal ownership beginning in 2015 and projected out to 2034. These figures represent the total revenue requirements of a Town-owned system and may be directly compared to our estimates for continued operation by the Milford Water Company. This section presents our conclusions relative to the economic feasibility of municipal acquisition by the Town of Milford. This determination is based on a financial model that calculates the impact on water rates if the Town of Milford were to acquire the assets of the Milford Water Company in the Town of Milford. An overview of the model is presented in this section, and the results for each component and totals under both ownership options are provided in Schedule 9-1.

SECTION 9.2 - PUBLIC VS. PRIVATE REVENUE REQUIREMENTS (CASH BASIS VS. UTILITY BASIS)

Most publicly owned utilities plan for and manage their cash flow requirements or budgets on a “cash basis.” This term is used to describe and categorize the component and total revenue requirements (or all costs of providing service) typically associated with publicly owned and operated utilities. In broad terms, revenue requirements include O&M costs, debt service payments, and cash capital requirements. The equivalent categories of revenue requirements for privately owned utilities include O&M expenses, depreciation and return on investment. This latter approach to categorizing and specifying total and component costs for private systems is referred to as the “utility basis.”

The Cash Basis method is used by almost all government owned utilities. If the Town does go forward with the acquisition, it is recommended that the Town set up the utility as a self-sufficient Enterprise Fund. In such a system the revenues that are generated by

the utility must be sufficient to pay all operating and capital costs. As applied to the Town of Milford for its Water Enterprise Fund, their total revenue requirements would consist of O&M costs, debt service payments, other cash capital requirements, payments for Town services if applicable, and a Payment In-Lieu-Of Taxes (PILOT), if needed. Because the Town Administrators have decided to not make direct payments for fire protection services, they have also decided to not charge the Water Enterprise Fund a PILOT. These can be viewed as break-even or counterbalancing measures. As shown in Section 8, the net impact to the Town due to these counterbalancing measures, is a savings of about \$100,000 per year.

SECTION 9.3 - TOTAL ESTIMATED COSTS UNDER MUNICIPAL OWNERSHIP

This section summarizes all of the various costs that would be incurred by municipal ownership and operation of the water system, which includes: Operations and Maintenance Costs (O&M), Debt Service on bonds issued to fund purchase of the water system, Major Capital Improvement Costs, Renewal & Replacement Costs (R&R), and Payments for Town Services. All of these costs except the last one were estimated in prior sections. Payments for Town Services will be estimated in this section and added to all others, resulting in our estimate of total costs under municipal control. Each cost is projected for the evaluation period starting in 2015 and ending in 2034. To the extent that one ownership option shows significant economic advantages over most of that period, it can be assumed that the economic advantage will only continue in the same direction beyond the 20 year evaluation period. The following discussion of the cost components under municipal ownership refers to Lines 1-6 of Schedule 9-1.

Schedule 9-1 Feasibility Model, Base Case (FY 2015 – FY 2024)

Schedule 9-1 Base Case		TOWN OF MILFORD - MUNICIPAL WATER SYSTEM									
		Estimated Total Annual Revenue Requirements									
Line No.	Municipal Department	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	Operating Costs										
1.)	Operation & Maintenance	\$2,700,000	\$2,835,000	\$2,976,750	\$3,125,588	\$3,281,867	\$3,445,960	\$3,618,258	\$3,799,171	\$3,989,130	\$4,188,586
2.)	Renewal & Replacement	\$800,000	\$816,000	\$832,320	\$848,966	\$913,946	\$932,225	\$950,869	\$969,887	\$1,039,284	\$1,120,070
3.)	Town Services	\$250,000	\$262,500	\$275,625	\$289,406	\$303,877	\$319,070	\$335,024	\$351,775	\$369,364	\$387,832
	Capital Costs										
4.)	Debt Service - Acquisition General Obligation Bonds	\$3,051,767	\$2,999,663	\$2,947,560	\$2,895,457	\$2,843,353	\$2,791,250	\$2,739,147	\$2,687,043	\$2,634,940	\$2,582,837
5.)	Debt Service - Capital Improvements										
5a.)	2018 Capital Improvement Bond		\$ 10,000	\$ 30,000	\$ 336,000	\$ 326,400	\$ 316,800	\$ 307,200	\$ 297,600	\$ 288,000	\$ 278,400
5b.)	2023 Capital Improvement Bond							\$ 45,000	\$ 135,000	\$ 1,160,000	\$ 1,124,000
6.)	TOTAL	\$6,801,767	\$6,923,163	\$7,062,255	\$7,495,417	\$7,669,442	\$7,805,305	\$7,995,498	\$8,240,476	\$9,480,718	\$9,681,725
	Milford Water Company										
7.)	Estimated Annual Cost of Service	\$7,201,000	\$7,561,050	\$7,939,103	\$8,336,058	\$8,752,861	\$9,190,504	\$9,650,029	\$10,132,530	\$10,639,157	\$11,171,114
8.)	Debt Service - Capital Improvements 2023 Capital Improvement Bond									\$874,116	\$874,116
9.)	TOTAL	\$7,201,000	\$7,561,050	\$7,939,103	\$8,336,058	\$8,752,861	\$9,190,504	\$9,650,029	\$10,132,530	\$11,513,272	\$12,045,230
10.)	Estimated Savings	\$399,233	\$637,887	\$876,848	\$840,641	\$1,083,418	\$1,385,198	\$1,654,531	\$1,892,054	\$2,032,554	\$2,363,505
11.)	Percent Savings	5.54%	8.44%	11.04%	10.08%	12.38%	15.07%	17.15%	18.67%	17.65%	19.62%
12.)	Cumulative Savings	\$399,233	\$1,037,120	\$1,913,968	\$2,754,608	\$3,838,026	\$5,223,225	\$6,877,755	\$8,769,809	\$10,802,364	\$13,165,869

SECTION 9.3.1 – OPERATIONS & MAINTENANCE (O&M) COSTS

Total O&M costs under municipal control were estimated in the prior section and are listed on Line 1 of Schedule 9-1. Total costs are estimated at \$2.7 million in 2015 and are escalated at a 5% annual rate thereafter.

SECTION 9.3.2 – RENEWAL & REPLACEMENT (R&R) COSTS

R&R costs (Line 2 of Schedule 9-1) for the municipal utility are estimated at \$800,000 in 2015 and escalates at an annual rate of 2.0% thereafter. This cost category includes all capital improvements the utility finances from current revenues. This includes such items as replacement mains, meters, and components or equipment at treatment facilities. This estimate is based on and is similar to the use of depreciation expenses by private utilities to continuously maintain and replace existing facilities as they age and wear out over time. Here it is assumed that the average life expectancy of all of a water utility's assets is about 55 years on average, resulting in a level of funds for annual R&R of about 2.0% (equivalent to an average depreciation rate of 0.02). This results in the estimate of R&R funding in 2015 ($\$44,000,000/55 = \$800,000$). Additionally, because of the future plant additions to be funded with bonds will add \$2.4 million and \$8 million to total plant, in 2019 the R&R funding will increase by \$48,000 (first improvement bond) and in 2023 it will increase by \$50,000, in 2024 by \$60,000 and in 2025 by \$50,000 (second improvement bond issue – additions spread over three years as these capital improvements are placed in service).

SECTION 9.3.3 – TOWN SERVICES

Assuming the Town has in place the capability of preparing bills, sending them out and tracking all payments, the Town's administration may decide to add this responsibility to its accounting and treasury functions. It is estimated that this will cost about \$250,000 initially and is likely to increase each year thereafter at a rate of escalation 5% per year. This estimate should be sufficient enough to allow for outside consulting services to

assist in the transition and to provide ongoing data processing of the billing data. As this is a direct service to the water utility by the Town, the Town should be reimbursed for its cost of providing the service. That is why it is added to total costs and labeled separately as "Town Services" on Schedule 9-1, Line 3. It starts in the first year of municipal operations (2015), and by the end of the tenth year this cost escalates to approximately \$388,000.

SECTION 9.3.4 – CAPITAL COSTS

The capital costs category consists of two elements: the cost of acquisition by the Town (reflected in the general obligation bond payments on Line 4) and the cost of future capital improvements to the system (shown on Line 5a and 5b). The debt service component consists of the annual principal and interest payments on the utility's existing debt, including any refunded debt. Here, as in most acquisitions, the largest component of debt service will be incurred directly to provide the funds needed to purchase the system through the issuance of new debt. This component could also include the funding of debt reserves required by banks.

The bonding requirements are derived from Tata & Howard's "Master Plan and Capital Improvements Plan" for the Milford Water Company, completed in 2010. Based on the recommendations in that plan, we assumed that under Municipal ownership the Town would require two capital improvement bonds over the 20 year analysis period. In 2018, a \$2.4 million bond with a 5 year term at 4.0% will be used to pay for all Phase I improvements described in Section 5. In 2023, a second improvement bond of \$8 million with a 10 year term at 4.5% will be issued to pay for all Phase II projects described in Section 5. Each bond will be preceded by one or two Bond Anticipation Notes (BANs). The first improvement bond will be preceded by a \$250,000 BAN with an interest rate of 4.0% in 2016 (Interest Cost - \$10,000), and a \$500,000 BAN with an interest rate of 4.0% in 2017 (Interest Cost - \$10,000 + \$20,000). The second improvement bond will be preceded by a \$1.0 million BAN with an interest rate of 4.5%

in 2021 (Interest Cost - \$45,000), and a \$2 million BAN with an interest rate of 4.5% in 2022 (Interest Cost - \$45,000 + \$90,000).

SECTION 9.3.5 – ESTIMATED TOTAL REVENUE REQUIREMENTS UNDER MUNICIPAL CONTROL

The estimated total revenue requirement for the utility under municipal control is shown on Line 6 of Schedule 9-1 for the 20 year analysis period. Line 6 is the summation of the Operating Costs (Lines 1-3) and the Capital Costs (Lines 4, 5a. and 5b.) under the municipal ownership scenario. In 2015, the estimated revenue requirement is \$6,801,767. Our analysis projects a compound annual growth rate of 2.53 over the study period, resulting in an estimated total cost of \$9,681,725 in 2024 and \$10,941,420 in 2034.

SECTION 9.4 – Estimated Costs under Continued Private Ownership

Also shown on Schedule 9-1 is the total revenue requirements associated with private ownership. The Department in MDPU 12-86 set the revenue requirement at a level designed to match total system costs over the twelve month period ending in August 2014. Therefore, the first year (FY2015) total cost was set at the level of total revenues (\$7,082,894) allowed by the Department escalated for four months (one-third of a year) to the middle of FY 2015 (December 31, 2014). Thus, the first year total costs under continued private ownership was set at \$7,201,000 { = \$7,082,894 x [1 + (5%/3)]}. Beyond 2015 it is assumed that the Company's total costs will be allowed on average to increase by 5% per year. In practice those increases are only going to be realized every 2 or 3 years, but for comparison purposes it is assumed that smaller increases will be realized every year. For example, if the next increase isn't realized until 2017, it is very likely to be significantly greater than 10%; and thus the average annual increase would exceed 5%. Historically, the Company has received increases significantly higher than 5% per year on average. It is also noted that the Company has set a policy of petitioning the Department every two years for an increase in general water service rates.

Thus, the cost of service under continued private control is estimated to be \$7.2 million in the first year of the forecast period. This is shown on line 7 of Schedule 9-1. Each year thereafter it is escalated at the rate of 5% to capture an inflation rate that approaches the level experienced in Milford over the last few decades. This was done so that year to year comparisons could be made rather than showing larger sporadic spikes in rate revenues every 2 to 4 years following rate increase cases.

Because of the level of depreciation expenses allowed in MWC's revenue requirements, all of the improvements in Phase I will be funded from internally generated sources (depreciation expense). By 2023 the depreciation accounting will no longer be able to keep up with improvement needs, resulting in the need for the Company to borrow funds to accommodate \$8 million more in capital improvements corresponding to same improvements (Phase II) needed under the public option. Thus, to put the private option on a comparable footing with respect to capital costs, one bond is issued in 2023 to cover additional capital costs that are in excess of those improvements that are funded from current revenues (depreciation and net income). The Phase I facilities that were funded by the bond issue in 2019 under public ownership would be largely funded from internal resources under the continued private option. However, Phase II and possibly some of the Phase III improvements would require additional borrowed funds at about the same time the second bond issue under public ownership would be needed.

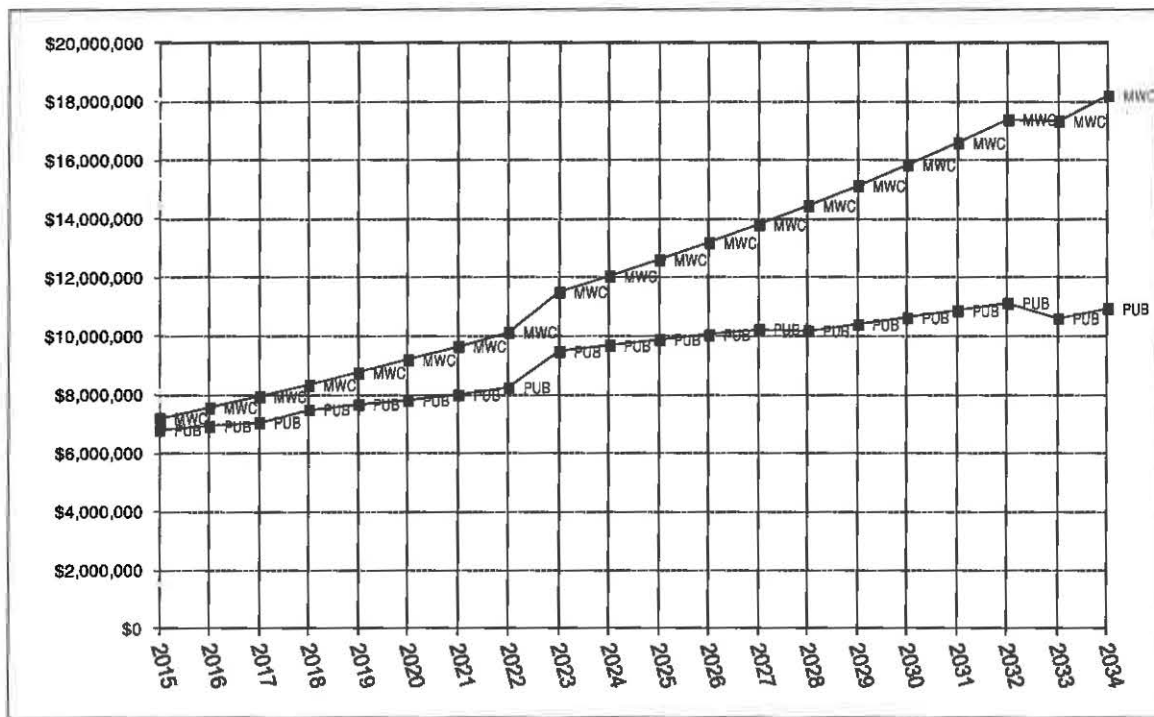
Therefore, it is assumed that the MWC would issue a Bond in 2023 for \$6 million at 7.5%, which would be amortized over 10 years with constant payments of \$874,116. This is shown on line 8 in Schedule 9-1, starting in 2023. Line 9 is the sum of lines 7 and 8, which equals the total cost of service under continued private ownership. By 2024, the estimated total cost of service 10 years into the study period is estimated to be approximately \$12,045,000; and by 2034 they are projected to equal about \$18.2 million.

Line 10 is the difference between the total costs of continued private control (Line 9) and the total costs of municipal ownership and operation (Line 6). Thus, a positive

difference indicates that ratepayers would be saving that amount in the aggregate if the Town acquires the water system, and a negative number would indicate that ratepayers under the public option would be paying that much more. For both projections, it is assumed that total consumption stays at an average annual usage of about 810 million gallons throughout the study period. The model uses this assumption and several others that were outlined in Sections 6 through 9. The rate adjustment necessary to meet the revenue requirement is used to determine the impact on customer water rates in Section 11.

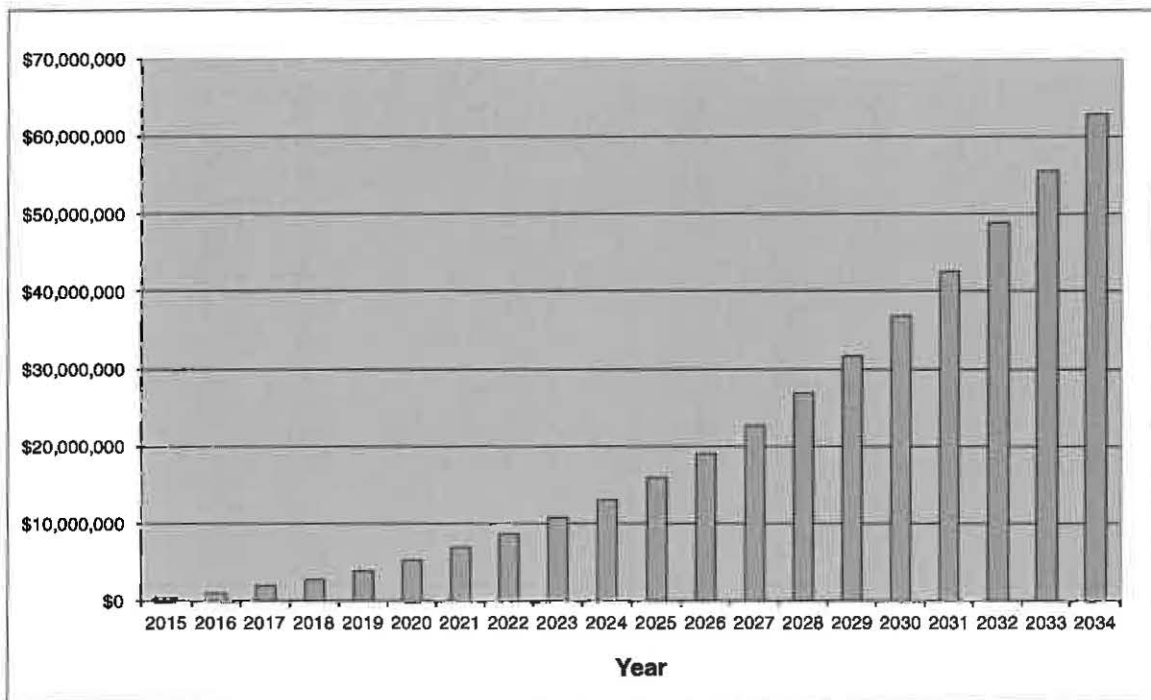
Figure 9-1 shows the annual total costs under municipal control graphically. The line labeled "PUB" (for Public ownership) corresponds to municipal owned and operated. The line labeled "MWC" represents the projected revenue requirements for continued private ownership. While the total costs are relatively close (average about 9.5% per year less for the first 5 years), the lines begin to diverge as a result of the difference in cost structures between the two ownership scenarios. As stated above, while the cost growth under municipal control is projected at 2.53% per annum over the study period, the cost growth for the private ownership is projected at 5.0%. There are many factors that contribute to this difference in costs. One major factor is the decreasing cost associated with the bonds issued to pay for the purchase. The repayment of these bonds is on a constant principal basis, which results in significantly lower interest charges as more of the principal is paid off each year. Thus, while the initial debt service payment in 2015 is \$3.05 million, by 2024 (tenth year of public ownership) it has decreased to \$2.58 million, a decrease of \$470,000 and by the last year of the 20 year planning horizon it has decreased to \$2.06 million, a decrease of \$990,000. The terms available to public utilities are more favorable than those available to private enterprise. In general, costs and rates under private operation have historically increased at an average annual rate of about 6% to 7% (about 2 times faster than projected for public ownership and operation).

Figure 9-1 Comparison of Public vs. Private Total Annual Costs - Base Case



Lastly, the percent difference between the level of rate revenues required under municipal ownership and operation versus continued private ownership is shown on Schedule 9-1, Line 11. By 2024, half-way into the 20 year study period, the projected annual savings equals approximately \$2.36 million, and cumulative savings reach nearly \$13.2 million. Cumulative savings at the end of each forecast year are shown on Line 12 of Schedule 9-1 and are depicted graphically on Figure 9-2.

Figure 9-2 Base Case Cumulative Annual Savings/Loss



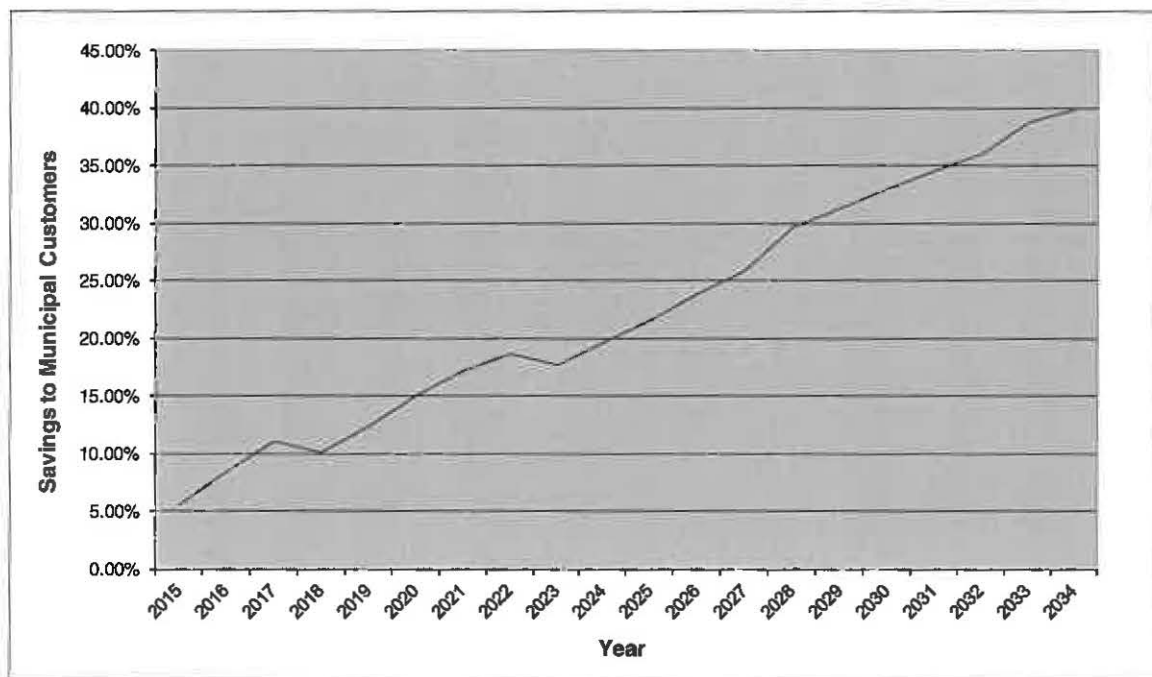
Section 9.5 – Comparison of Total Costs: Private vs. Public Ownership

From Schedule 9-1, it is easy to see that the bottom line impact is that municipal control will produce significant savings initially and throughout the study period. Estimated savings in the first year is about \$400,000 (5.5% lower than the private option). For the next 4 years (2016 through 2019) the savings average about \$850,000 lower (about 10% less on average). From there the savings increase by about \$250,000 per year through the end of the first 10 years (2024 – savings equal about \$2.36 million, a 19.6% savings).

Again, line 11 in Schedule 9-1 expresses savings under municipal ownership as a percentage and represents how much less customers under municipal ownership and operation would be paying versus projected rates under continued private ownership, assuming all savings were passed on to consumers. So, a positive percentage indicates savings under public ownership and a negative percentage would indicate that customers under public ownership and operation would pay that much more versus continued private operations. Line 11 remains positive throughout the study period

under base-case assumptions. For example, in the first five years (2015-2019) under public ownership and operation, customers would pay about 9.5% less (on average) than they would have under continued private ownership and operation. Over the next 5 years (2020 through 2024), customer savings are projected to average about 17% per year. By the end of the forecast period, savings are projected to reach nearly 40% when compared to the rates they would pay if the utility remained under private control. The annual percentage savings over the study period are shown graphically in Figure 9-3. It should be noted, however, that the certainty or confidence associated with each estimate diminishes considerably the further out in the study period that is being considered. For example, while the confidence associated with the estimated savings in the first 5 years is quite high (relatively high), the confidence associated with the estimated savings in the last 5 years of the study is much lower (relatively low).

Figure 9-3 Annual Percentage Savings, Base Case



SECTION 9.6 – Conclusion and Next Steps

From the foregoing analysis, it is clear that under base case assumptions the acquisition of the Milford Water Company is feasible from a financial and economic viewpoint. Of course this assumes that all of the estimates in the base case turn out to be correct. If one or more variables turn out to be significantly off, the results presented in this section could differ from reality. In the next section, we test how variances from the estimates used in the base case could result in modifying our feasibility conclusion. This is accomplished by varying one or more of the estimated values and substituting them in the same model to observe the sensitivity of our analysis to changes from the base case assumptions.

SECTION 10 – Sensitivity Analysis

SECTION 10.1 – INTRODUCTION

In this section, we attempt to test the robustness of our feasibility model by performing a sensitivity analysis. This sensitivity analysis will increase our understanding of the relationships between the input and output variables in the feasibility model. Starting with the base case from previous sections, we modify one or more of the input variables and observe how that change affects the bottom line results. Certain input variables used in the feasibility model may vary significantly from the base case, producing a variance from the model's projections. Sensitivity analysis answers the question, "if these variables deviate from expectations, what will the effect be on the forecast model, and which variables are causing the largest deviations?" For example, how would our results change if the realized purchase price is significantly higher than our estimate used in the base case? Would a 10% higher purchase price alter the results enough to change our conclusion relative to feasibility? Would a 20% higher value change our conclusion? Using the approach of only changing the purchase price while holding all other input variables the same as in the base case, it is possible to estimate the maximum price the Town could "afford" to pay for this acquisition, all else being equal. The purchase price is clearly one of the more critical (and sensitive) estimates used in our analysis, and will be tested in this section. The various sensitivity cases (or scenarios) will test the following key variables:

- Purchase Price
- Operation & Maintenance Costs – Base Year Value (Public Option)
- Bond Interest Rate (Public Borrowing)
- Multi-variable cases

Sensitivity Cases 1-3 will focus on the impact of a change in the value of a single variable (e.g. purchase price, interest rate) in a direction unfavorable to the Town. Sensitivity

Cases 4a. and 4b. test the impact of two or more of the base case input variables, based upon scenarios developed during our study.

The Sensitivity Cases are summarized in Table 10-1 below. For each Sensitivity Case, the specific input variable to be tested is shown under the Test Variable column. For each of the ten sensitivity cases, the test variable(s) of interest have been altered from the base case value, and the new value is shown in the corresponding row. A dash indicates that the variable has not been changed from the base case value.

Table 10-1 Summary of Sensitivity Cases

	Test Variable				
	Purchase Price	Public O&M Cost (2015 Value)	Public Borrowing Rate	Private Cost Escalation Rate	Public Cost Escalation Rate
Base Case	\$44.66 million	\$2.7 million	3.5%	5.0%	5.0%
Sensitivity Case 1A	\$50.75 million	--	--	--	--
Sensitivity Case 1B	\$38.57 million	--	--	--	--
Sensitivity Case 2A	--	\$2.8 million	--	--	--
Sensitivity Case 2B	--	\$2.9 million	--	--	--
Sensitivity Case 3A	--	--	4.0%	--	--
Sensitivity Case 3B	--	--	4.5%	--	--
Sensitivity Case 4A	\$50.75 million	\$2.8 million	4.0%	--	--
Sensitivity Case 4B	\$50.75 million	\$2.8 million	4.0%	6.0%	4.0%

For each sensitivity case, we will examine specific forecast model outputs to determine the impact to the Town's bottom line. The model outputs of interest are those which strongly influence the feasibility of the Town's purchase. Each sensitivity case therefore, will be judged according to the following criteria:

- 10-Year Cumulative Savings with Municipal Control (Through Forecast Year 10 or 2024)
- Number of Years in which Municipal Costs Exceed Private Costs
- Maximum Annual Loss/Minimum Annual Savings under Municipal Control

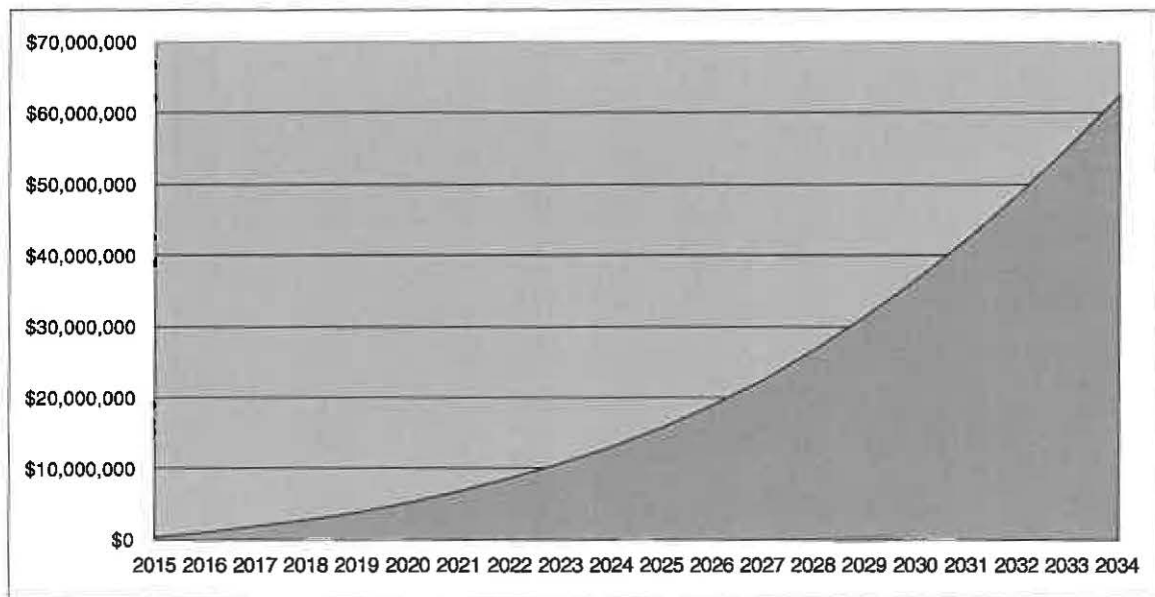
- Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control

For example, to compare the impact of the Town having to pay a purchase price greater than the value assumed for the base case (\$44.66 million), we will show how four key output factors change as the purchase price variable is set at successively higher levels in the forecast model. The base case output factors will serve as a baseline throughout this analysis and will appear with the results of each sensitivity case. For the base case, the values for these four output factors are as follows:

- 10-Year Cumulative Savings with Municipal Control – \$13.16 million
- Number of Years in which Municipal Costs Exceed Private Costs – Zero
- Maximum Annual Loss/Minimum Annual Savings under Municipal Control – \$399,233 (Savings in 2015)
- Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control – 5.54% (Savings in 2015)

The cumulative annual savings/losses associated with municipal control versus private ownership are shown graphically in Figure 10-1 through Figure 10-11 for the base case assumptions along with each of the sensitivity cases. That is, following the comparison of each sensitivity case for changes in one or more input variables, we provide the same graphic corresponding to the cumulative savings/losses associated with that case. The cumulative savings projected under the Base Case assumptions is shown in Figure 10-1.

Figure 10-1 Base Case Cumulative Annual Savings/Loss



SECTION 10.2 – SENSITIVITY CASES

SECTION 10.2.1 – SENSITIVITY CASE 1

As indicated above the likely range of purchase prices that the Department would consider approving is bounded on the low end by the Original Cost Less Depreciation (OCLD) value, and on the high end by the Reproduction Cost New Less Depreciation (RCNLD) value. Thus, to be conservative we will estimate a likely range of values centered on the mid value of these two extremes. The mid-range value was used in our analysis to establish a Base Case (the mid-range value is \$44 million). The Base Case is based on what were considered to be the most likely estimates of key input variables). Two sensitivity cases were evaluated using two other estimates of the PP; one significantly greater than the mid-range value (\$50 million); and one significantly less than the mid-range value (38 million). The case with the greater PP estimate was based on the value half way between the OCLD value and the mid-range value. The case with the lower PP estimate was be based on the value half way between the mid-range value and the RCNLD value.

On the high side of the Base case a purchase price of \$50 million was tested to evaluate the sensitivity of this key factor on the economic feasibility of municipal acquisition. The purchase price associated with the base case is \$44 million, so this case tests a purchase price which is 13.6% higher than the base case figure. On the low side of the Base case a purchase price of \$38 million was tested to evaluate the sensitivity of this key factor on the economic feasibility of municipal acquisition. The purchase price associated with low end of the likely range was \$38 million, which is 13.6% lower than the base case figure.

Table 10-2 Purchase Price Values, Sensitivity Cases 1A and 1B

Sensitivity Case (Abbreviation)	Purchase Price
SC-1A	\$50,000,000
SC-1B	\$38,000,000

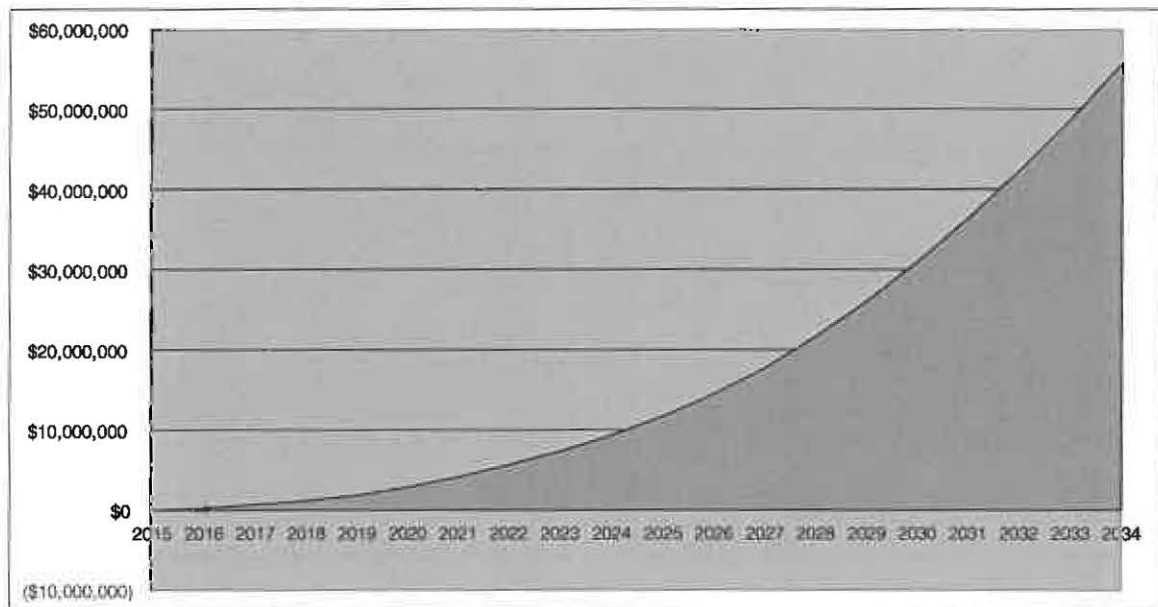
The impacts on each of the four key output factors for Sensitivity Cases 1A and 1B are summarized in the following table (Base Case included for reference):

Table 10-3 Purchase Price Sensitivity

Key Factor	Base Case	SC-1A	SC-1B
10-Year Cumulative Savings with Municipal Control	\$13.16 million	\$9.32 million	\$17.00 million
Number of Years in which Municipal Costs Exceed Private Costs	0	1	0
Maximum Annual Loss/Minimum Annual Savings under Municipal Control	\$399,233	(\$16,917)	\$815,383
Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control	5.54%	-0.23%	11.32%

The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 1A in Figure 10-2.

Figure 10-2 Cumulative Annual Savings/Loss (Sensitivity Case 1A)

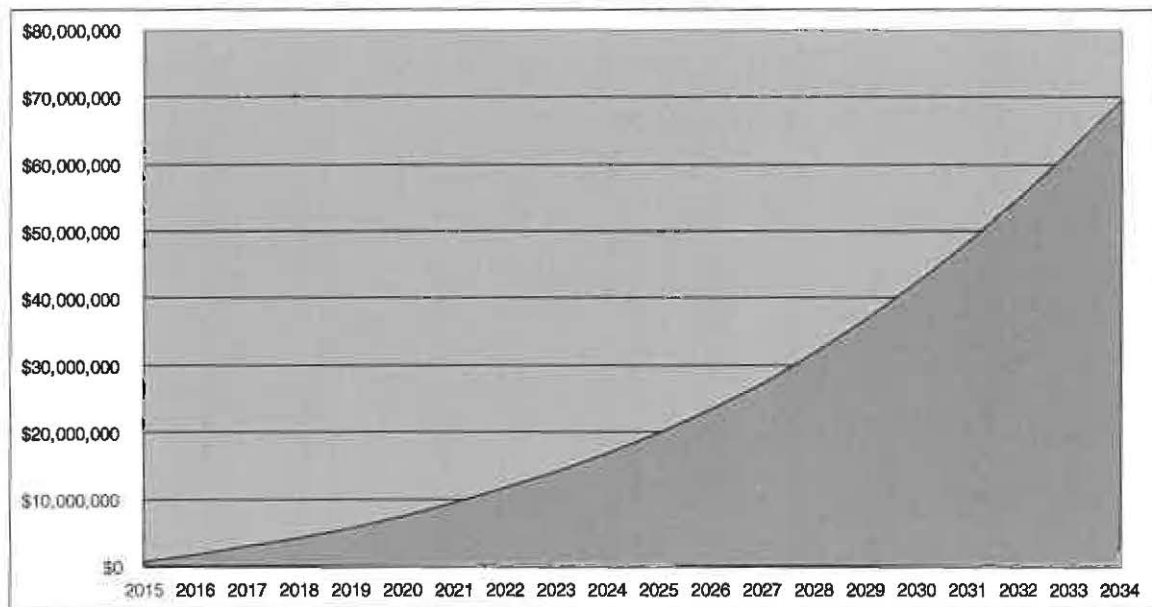


Comparing this figure with Figure 10-1 (Base Case) it is clear that the cumulative savings are only marginally lower each year. As expected the savings the first year are significantly lower (about \$416,000 less), resulting in a loss as compared with the private option of about \$17,000. However, while the cumulative savings by the end of the tenth year are about \$3.8 million less, they are still very significant at \$9.3 million. And, by the twentieth year while cumulative savings are about \$7 million lower, they still total nearly \$56 million.

From the foregoing, it is clear that the economic feasibility of the municipal acquisition is sensitive to the PP. For example at 50 million, the first 10 year savings still exceed \$9 million (25% less than the Base Case), and there is one years in which there would be a loss (less than -1.0%).

The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 1B in Figure 10-3.

Figure 10-3 Cumulative Annual Savings/Loss (Sensitivity Case 1B)



Since the Base case assumptions resulted in very significant saving at a higher PP than this case by \$6 million, it is no surprise that this case would result in even higher savings as compared with the private option. From table 10-3 the savings are about \$4 million higher by the end of the tenth year, and the minimum annual savings is greater than \$800,000 (or 11% higher). By the end of the study period (FY2034) the projected savings are estimated to be just under \$70 million.

Because it is remotely possible, we also tested the impact of the PP being as high as the value determined by relying 100% on the RCNLD method (\$56 million). In this case, the savings are either negative or less than 1% in each of the first 4 years (maximum loss - \$433,000 or -6%). However, even at this extreme value the cumulative savings by the end of the tenth year would be about \$5.5 million and by the end of the twentieth year they would still be just under \$50 million. For reasons explained above, it is our view that this is a very unlikely case. However, it does demonstrate the importance of the PP in estimating the economic impacts of the acquisition. It also gives strong support to our recommendation that the Town should know, before it puts the question of acquisition to vote, what is a realistic high side limit on what they would have to pay for

the system (PP). Clearly, if the PP exceeds the value we have estimated for the value determined from the RCNLD method, the economic benefit become marginal, and if high enough could result in the acquisition by the Town not being economically feasible.

SECTION 10.2.2 – SENSITIVITY CASE 2

Two cases with higher O&M costs under municipal ownership were tested to evaluate the sensitivity of this key factor on the economic feasibility of municipal acquisition. In the base case, O&M costs were \$2.7 million in 2015 and increased at 5.0% per year thereafter. The O&M costs for 2015 associated with each sensitivity case are listed below along with the abbreviation used for each:

Table 10-4 O&M Cost Values, Sensitivity Cases 2A and 2B

Sensitivity Case (Abbreviation)	O&M Costs in 2015
SC-2A	\$2.8 million (3.7% higher than Base Case)
SC-2B	\$2.9 million (7.4% higher than Base Case)

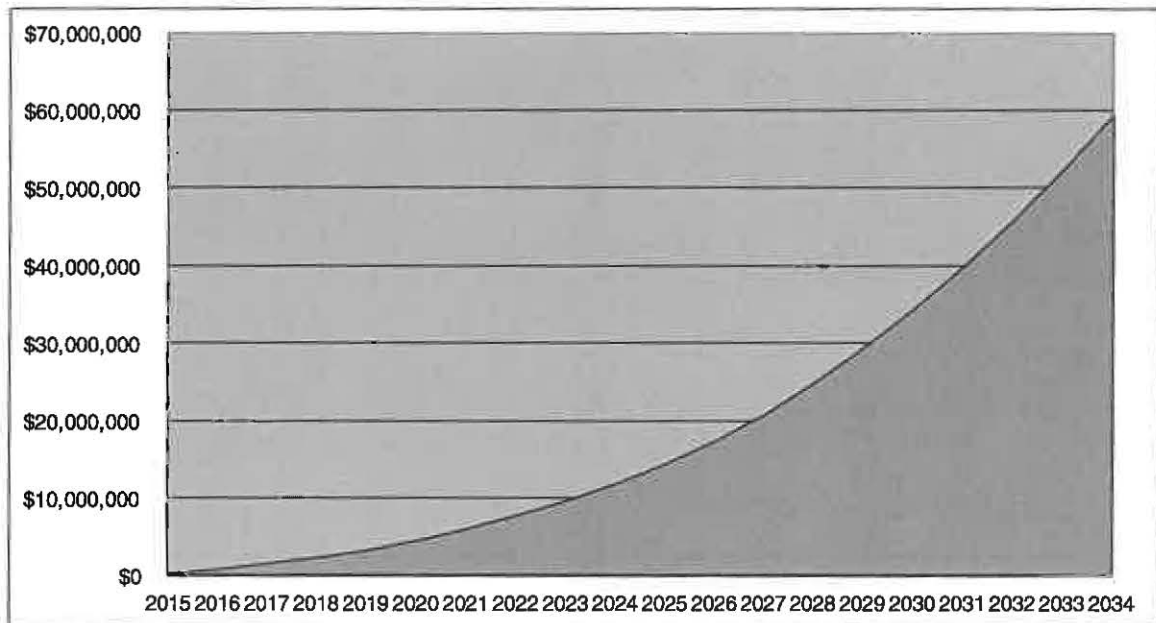
The impacts on each of the four key output factors for each sensitivity case and the base case are summarized in the following table:

Table 10-5 O&M Cost Sensitivity

Key Factor	Base Case	SC-2A	SC-2B
10-Year Cumulative Savings with Municipal Control	\$13.16 million	\$11.91 million	\$10.65 million
Number of Years in which Municipal Costs Exceed Private Costs	0	0	0
Maximum Annual Loss/Minimum Annual Savings under Municipal Control	\$399,233	\$299,233	\$199,233
Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control	5.54%	4.16%	2.77%

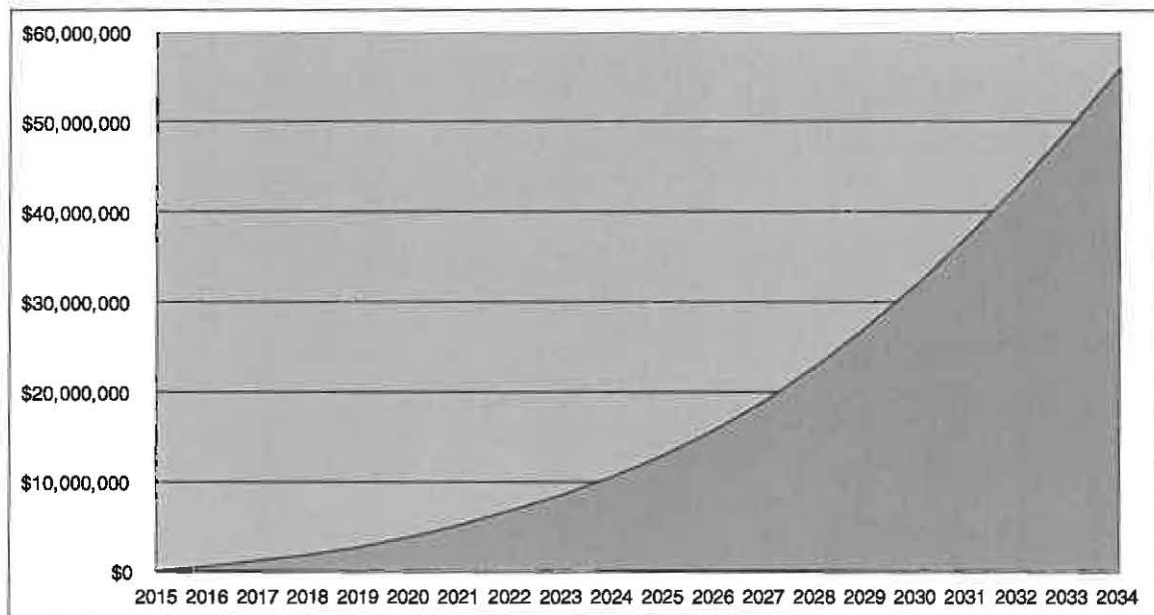
The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 2A in Figure 10-4 and for Sensitivity Case 2B in Figure 10-5.

Figure 10-4 Cumulative Annual Savings/Loss (Sensitivity Case 2A)



Comparing this figure with Figure 10-1 (Base Case) it is clear that the cumulative savings are only marginally lower each year. As expected the savings the first year are exactly \$100,000 less (25% less). However by the tenth year the cumulative savings are only about 7.7% lower (about \$12 million versus \$13 million), and by the twentieth year while cumulative savings are about \$3.3 million lower, they still total nearly \$60 million.

Figure 10-5 Cumulative Annual Savings/Loss (Sensitivity Case 2B)



Comparing this figure with Figure 10-1 (Base Case) it is clear that the cumulative savings are only marginally lower each year. As expected the savings the first year are exactly \$200,000 less (50% less). However by the tenth year the cumulative savings are only about 19% lower (about \$11 million versus \$13 million), and by the twentieth year while cumulative savings are about \$6.7 million lower, they still total nearly \$56 million.

From the foregoing, it is clear that the economic feasibility of the municipal acquisition is not very sensitive to the O&M costs under municipal ownership, unless those costs are much greater than expected. In SC-2A the first 10 year savings still approach \$12 million and there are no years in which there would be losses. And, in SC-2B the first 10 year savings are about \$10.65 million and there are no years in which there would be losses. Indeed, it is only when O&M costs with public ownership approach or exceed about \$3.5 million in 2015 does economic feasibility becomes questionable. At that level (\$35 million) our base case estimate would have to be off by at least 30% and a firm specializing in contract operations would have to be unwilling to operate the system even if they were offered \$600,000 annually above what they anticipated their maximum costs would be to operate this system. These are very unlikely scenarios.

SECTION 10.2.3 – SENSITIVITY CASE 3

Two cases with higher interest rates for the bonds needed to purchase the system were tested to evaluate the sensitivity of this key factor on the economic feasibility of municipal acquisition. The interest rate associated with the Base Case is 3.5%. The interest rate associated with each sensitivity case is listed below along with the abbreviation used for each:

Table 10-6 Interest Rate Input Values

Sensitivity Case (Abbreviation)	Interest Rate
SC-3A	4.0%
SC-3B	4.5%

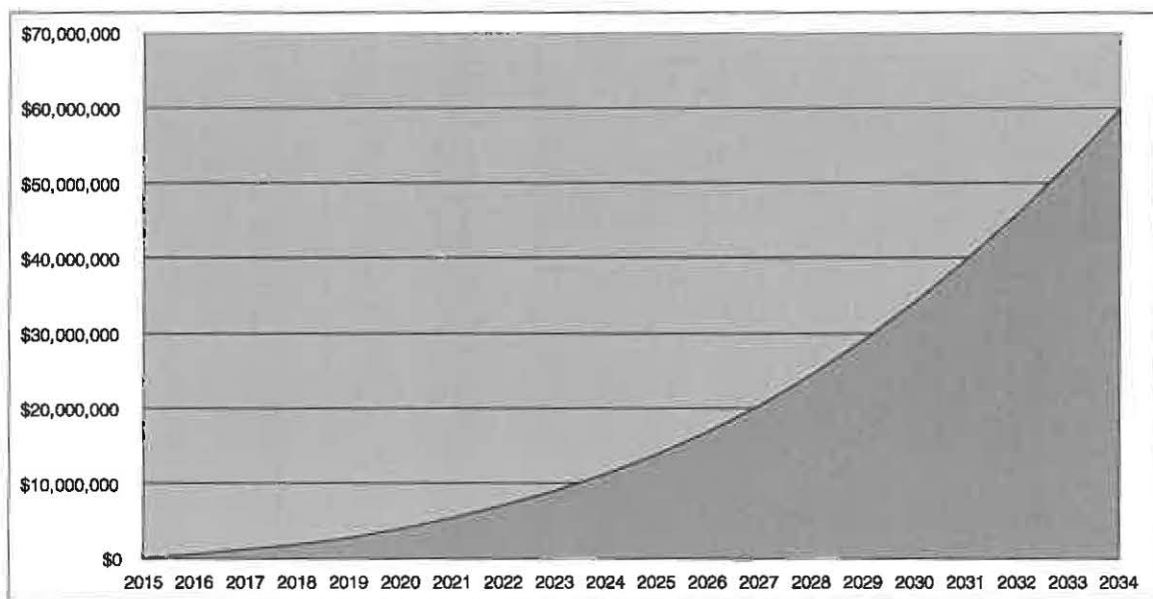
The impacts on each of the four key output factors for each sensitivity case and the base case are summarized in the following table:

Table 10-7 Interest Rate Sensitivity

Key Factor	Base Case	SC-3A	SC-3B
10-Year Cumulative Savings with Municipal Control	\$13.16 million	\$11.34 million	\$9.31 million
Number of Years in which Municipal Costs Exceed Private Costs	0	0	1
Maximum Annual Loss/Minimum Annual Savings under Municipal Control	\$399,233	\$175,933	(\$47,367)
Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control	5.54%	2.44%	-0.66%

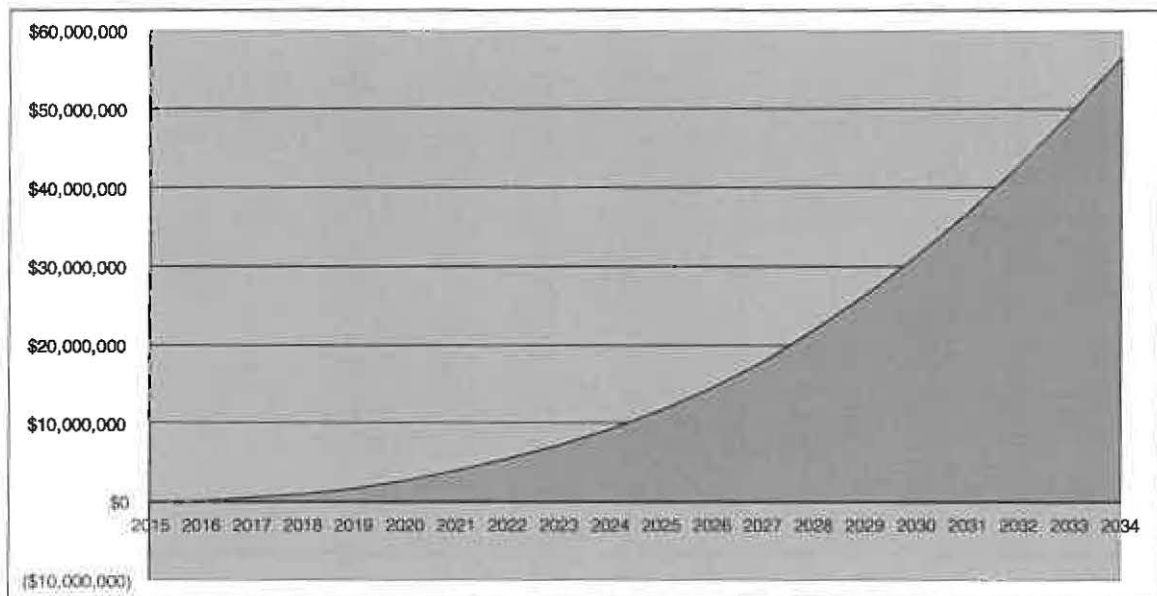
The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 3A in Figure 10-6 and for Sensitivity Case 3B in Figure 10-7.

Figure 10-6 Cumulative Annual Savings/Loss (Sensitivity Case 3A)



The impacts of these case are remarkably similar to the impacts estimated for the two prior sensitivity cases (2A and 2B). Comparing this figure with Figure 10-1 (Base Case) it is clear with SC-3A that the cumulative savings are only marginally lower each year. As expected the savings the first year are significantly lower (about \$200,000 or 50% less). However, by the tenth year the cumulative savings are only about 13% lower (about \$11.3 million versus \$13 million), and by the twentieth year while cumulative savings are about \$3.0 million lower, they still total nearly \$60 million.

Figure 10-7 Cumulative Annual Savings/Loss (Sensitivity Case 3B)



Comparing this figure with Figure 10-1 (Base Case) it is clear that the cumulative savings are only marginally lower each year. As expected the savings the first year are significantly lower (about \$450,000 less), resulting in a loss as compared with the private option of about \$50,000. However, by the tenth year while the cumulative savings are about \$4 million less, they are still very significant at \$9.3 million. And, by the twentieth year while cumulative savings are about \$6.2 million lower, they still total nearly \$57 million.

From the foregoing, it is clear that the economic feasibility of the municipal acquisition is relatively insensitive to the interest rate for debt. For example at 4% the first 10 year savings still exceed \$11 million and there are no years in which there would be losses. And, at 4.5% the first 10 year savings are about \$9.3 million and there is only 1 years in which there would be very minor losses (less than -1.0%). At 6% the economic benefits from municipal acquisition starts to become marginal over the first 10 years. Yet even at 6% the long run benefits are still very sizable. At interest rates above 6.5% municipal acquisition appears to not be economically feasible. There would have to be very major

disruptions to the financial markets for municipal interest rates to approach levels this high in the short run. This is a very unlikely scenario.

SECTION 10.2.4 – MULTIPLE INPUT VARIABLE SENSITIVITY CASES

Sensitivity Cases 4A and 4B will alter multiple inputs to estimate the impacts of three variables differing from the base case and each in the direction that would lessen the economic benefits of a public acquisition. Case 4A includes all of the single variable changes in cases SC-1A, SC-2A and SC-3A. Thus, with respect to the Base Case, SC-4A assumes the PP is \$6 million higher, Public O&M costs start at \$100,000 higher and the interest rate on the bonds to finance the acquisition are 50 basis points higher. While this case is not very likely it provides a good example of what the impact could be if all three of the main variables are somewhat different (and each in the direction of lowering the economic benefits of municipal acquisition) from the Base Case. SC-4B is the same as SC-4A, except it also assumes that O&M costs with municipal ownership (4% escalation) will not escalate as fast as those costs would with continued private ownership (6% escalation). This modification to SC-4A was added because this Company's costs have in the past escalated faster than most publicly owned and operated water systems. In that sense this case includes an additional likely circumstance that tend to offset the negative effects of this unlikely scenario. Table 10-8 summarizes the input variables as they relate to the Base Case values:

Table 10-8 Summary of Sensitivity Cases 4A and 4B

	Test Variable				
	Purchase Price	Public O&M Cost (2015 Value)	Public Borrowing Rate	Private Cost Escalation Rate	Public Cost Escalation Rate
Base Case	\$44.66 million	\$2.7 million	3.5%	5.0%	5.0%
Sensitivity Case 4A	\$50.75 million	\$2.8 million	4.0%	--	--
Sensitivity Case 4B	\$50.75 million	\$2.8 million	4.0%	6.0%	4.0%

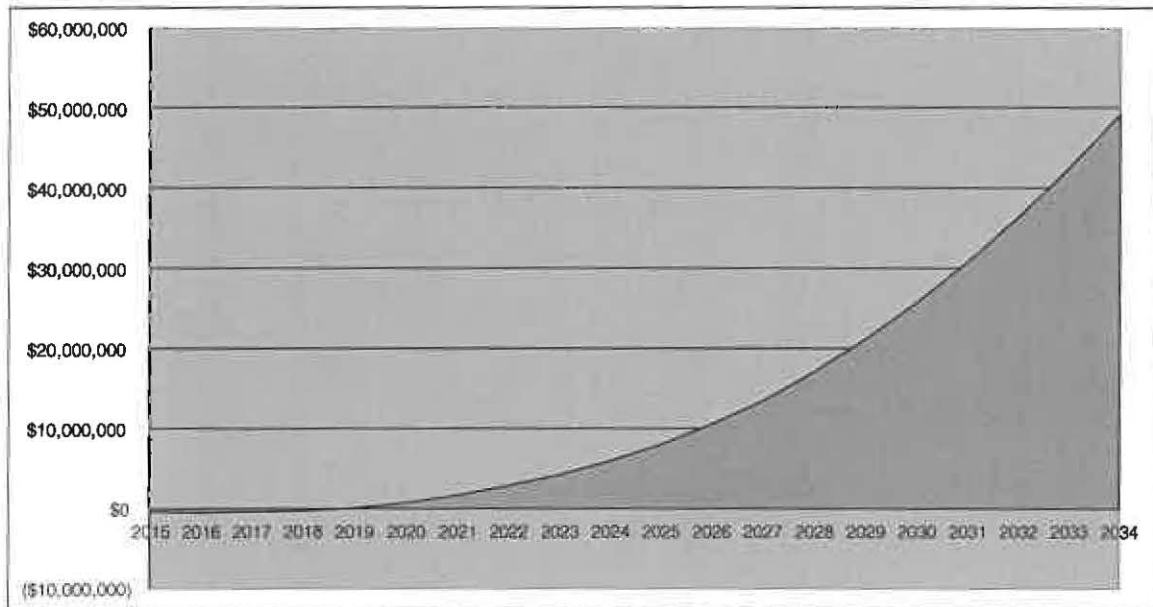
The impacts on each of the four key output factors for Sensitivity Cases 4A and 4B (and the base case for reference) are summarized in the following table:

Table 10-9 Output Summary for Sensitivity Cases 4A and 4B

Key Factor	Base Case	SC-4A	SC-4B
10-Year Cumulative Savings with Municipal Control	\$13.16 million	\$5.98 million	\$12.07 million
Number of Years in which Municipal Costs Exceed Private Costs	0	2	2
Maximum Annual Loss/Minimum Annual Savings under Municipal Control	\$399,233	(\$370,667)	(\$370,667)
Maximum Annual Percentage Loss/Minimum Annual Percentage Savings under Municipal Control	5.54%	-5.15%	-5.15%

The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 4A in Figure 10-8.

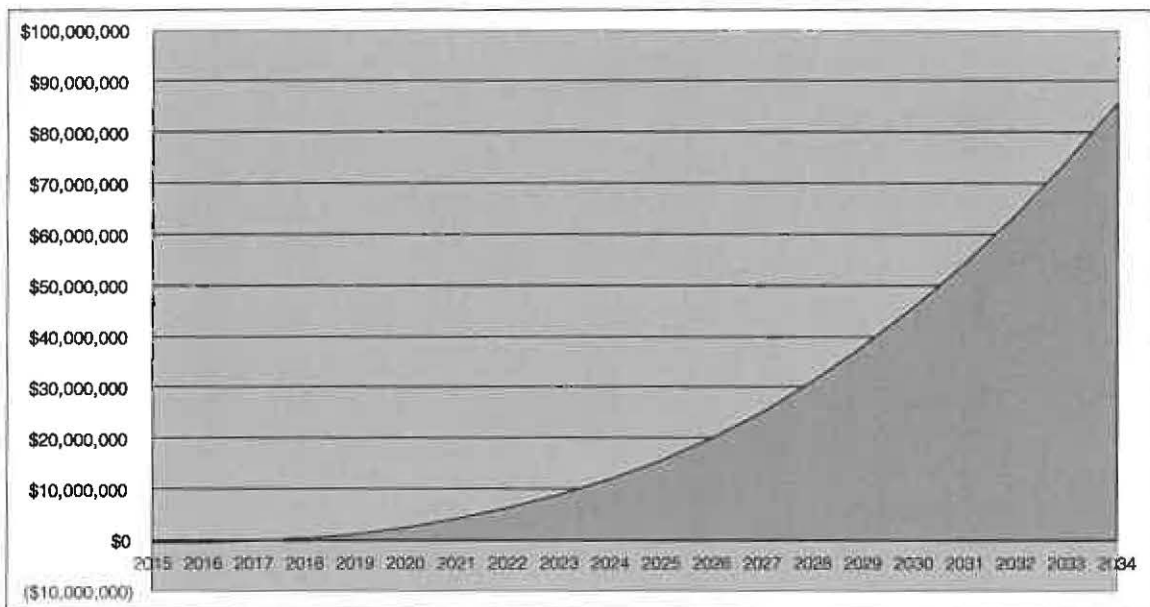
Figure 10-8 Cumulative Annual Savings/Loss (Sensitivity Case 4A)



As expected the economic impacts of SC-4A are significantly lower than the Base Case, particularly in the early years. In the first 2 years there are significant losses (\$371,000 and \$121,000, respectively), and the savings of only about \$100,000 in the third and fourth years. Cumulative savings do not become positive until the fifth year (FY2019), and only reach about half of the cumulative savings of the Base Case in 2024 (\$6 million versus \$13 million). Thus, the economic benefits of this case are only marginal in the short run. In the long run the cumulative savings do reach \$49 million by the end of the forecast period (FY2034). Because of the relatively low savings in the early years and the uncertainty associated with estimates in the long run, the economic feasibility of a public acquisition under this scenario would only be considered marginal.

The annual total cumulative savings/losses are depicted graphically for Sensitivity Case 4B in Figure 10-9.

Figure 10-9 Cumulative Annual Savings/Loss (Sensitivity Case 4B)



The economic impacts of SC-4B are similar to SC-4A for the first year or two. However, beyond that because of the differing escalation rate of public and private O&M costs, the economic benefits of public ownership quickly follow the impacts predicted in the Base Case. By 2024, the cumulative savings are almost the same as the Base Case and by the end of the forecast period, they significantly exceed the Base Case by \$23 million (\$86 million versus \$63 million). Therefore, by adding this likely modification to SC-4A, a scenario that was only marginal, becomes very feasible from an economic perspective. Clearly, if this same modification was added to any of the other sensitivity cases the economic benefits of public acquisition would increase significantly in comparison with continued private ownership. Thus, without this modification each of the other cases include an additional element of conservatism, which indicates that under the assumptions in each case the analysis errs on the side of forecasting fewer economic benefits for municipal acquisition than it would have otherwise.

Section 10.3 – Summary of Sensitivity Analysis

The relative economics of municipal acquisition versus continued private control is sensitive to three key factors tested individually. As indicated, the economics are relatively sensitive to variations in some of these factors, and relatively insensitive to others. However, the assumed values for each of these factors would have to be off considerably after the fact to result in a situation where significant economic benefits associated with municipal acquisition would not be realized. For example, the assumed Purchase Price in the base case of \$44 million would have to be off (low) by about \$12 million for the economic benefits of municipal acquisition to not be high enough to warrant a decision to not go forward with the acquisition based solely on the lack of significant economic benefits in the first ten years.

As shown by Sensitivity Cases 1, the economic benefits associated with municipal acquisition are sensitive to the level of PP that the Town would have to pay to acquire the water system. However, unless the PP approaches or exceeds the estimated high end (about \$56 million) of the likely range of PPs predicted herein, significant economic benefits would be realized by the Town.

As shown by Sensitivity Case 2, the economic benefits associated with municipal acquisition are relatively insensitive to the level of O&M costs that the Town would incur if it owned and operated the water system. Therefore, unless their O&M costs approached or exceeded about \$3.5 million (30% higher the level assumed in the Base Case) in the first year of municipal control, significant economic benefits would be realized by the Town.

As shown by Sensitivity Case 3, the economic benefits associated with municipal acquisition are relatively insensitive to the level of the interest rate associated with the bonds issued to fund the purchase of the water system. Therefore, unless the interest rates approached or exceeded about 6.0% (about 100% higher than the level assumed in the Base Case), significant economic benefits would be realized by the Town.

As shown in sensitivity case SC-4A, the economic benefits of this case are only marginal in the short run. In the long run the cumulative savings do reach \$49 million by the end of the forecast period (FY2034). Because of the relatively low savings in the early years and the uncertainty associated with estimates in the long run, the economic feasibility of a public acquisition under this scenario (higher PP, higher public O&M costs, and a higher interest rate) would only be considered marginal. The economic impacts of SC-4B are similar to SC-4A for the first year or two. However, beyond that because of the differing escalation rates of public and private O&M costs (the only different assumption for SC-4b versus SC-4A), the economic benefits of public ownership quickly follow the impacts predicted in the Base Case. By 2024, the cumulative savings are almost the same as the Base Case and by the end of the forecast period, they significantly exceed the Base Case by \$23 million (\$86 million versus \$63 million). Therefore, by adding this likely modification to SC-4A, a scenario that was only marginal, becomes very feasible from an economic perspective.

SECTION 11 – CUSTOMER IMPACTS

SECTION 11.1 – INTRODUCTION

As indicated in Section 9, the total estimated revenue requirements using the base case assumptions are estimated to be considerably less than those under continued private ownership. In the first two years (FY2015 and FY2016) after municipal acquisition, total costs (or total revenue requirements) are estimated to be on average about \$500,000 per year less (7.0%) than they would be under continued private control. This is shown graphically in Figure 10-1. For the next four years (FY2017 to FY2020), the advantage for municipal control increased to about \$1 million per year (12.0%). For the following four years (FY2021 to FY2024), the difference increases relatively uniformly starting at \$1.65 million (17.2% savings) in FY2021 and reaching \$2.4 million (19.6% savings) in 2024. This is also shown in Figure 10-1. Thus, on average, over those four years, we project the rate revenues to be approximately 18.5% less under municipal control. This trend is likely to continue beyond 2024 unless one or more of our major assumptions are significantly off. However, at some point, the future savings will level off when the economic advantages of public ownership have been fully realized—perhaps at the level of 35% to 40% savings.

SECTION 11.2 – IMPACT OF RATE REVENUES & RATES UNDER BASE-CASE ASSUMPTIONS

Because total costs are expected to be considerably lower under municipal control throughout the twenty-year study period, the rates charged to all customers could be lower than they would be under private ownership. In the first two years (FY2015 and FY2016), they could be about 7.0% lower. In the following four years (FY2017 to FY2020), they could be about 12.0% lower. And, in the years (FY2021 to FY2024), they could be about 18.5% lower. After the first ten years, the rates under municipal control could average about 20% to 40% lower over the next ten years. Under this scenario, it would probably be better if the Town levelized the rate impacts of the whole forecast

period. For example, rather than have the fluctuation in rates just described, the Town could implement rates that are set at a level of 10% to 14% below those that the private company would have charged over the first ten years of the study period. Again, beyond the first ten years, the uncertainty associated with estimates increases considerably, and confidence in the forecast diminishes rapidly.

Specifically, this would be the case for individual customers and customer classes if the Town decided to adopt the same rate structure and class contributions that the MDPU approved in the rate case decided last year (MDPU 12-86). However, if the Town did take over the water system, it would not be bound by the same rate structure or class allocations that were approved as part of that case. Indeed, its cost structure and rate design preferences are likely to diverge considerably from those approved in MDPU 12-86. This potential flexibility under municipal control will be discussed further below. Next we will compare rate levels under the two ownership/control options if the lower total costs with the public option are at the levels predicted in the Base Case scenario.

Section 11.3 – CUSTOMER BILL IMPACTS

To put this section into perspective, we have prepared a comparison of estimated typical bills from the Company going forward with those that would be charged by the Town, if it were to acquire the water system and all base case assumptions were realized. Table 11-1 contains this comparison. In prior sections, we quantified estimates of annual and cumulative savings under municipal ownership and operation of the Milford water system as compared to continued private ownership. Under base-case assumptions, these savings average about 10 to 14% in the early years and by FY2025 they start to exceed 20%.

In order to show how consumer rates may vary between these two ownership options, we have estimated what a typical customer's annual bill (residential) is projected to be under both options at a range of consumption levels. In order to make these comparisons, we made some simplifying assumptions:

- All of the assumptions and forecasts estimated in the Base Case are realized going forward.
- The unit rates for both options were based on the current rate structure and all increases in revenue requirements are passed on through an Across-the-Board (A-T-B) basis.
- Average rates for three future multi-year periods were considered and evaluated for this comparison. The three periods were as follows:
 - FY2015 and FY2016 (averaged over the two years)
 - FY2017 and FY2020 (averaged over the four years)
 - FY2021 and FY2024 (averaged over the four years)

Based on these assumptions, over the next two years (FY 2015 and FY2016) the average rate for each of the ownership options are as follows (quarterly):

Continued Private Ownership (MWC)

Customer Service Charge ----- \$35.10 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$4.197 per HCF

2nd Block (all use over 48 HCF) ----- \$6.297 per HCF

Public Ownership and Operation

Customer Service Charge ----- \$32.64 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$3.903 per HCF

2nd Block (all use over 48 HCF) ----- \$5.856 per HCF

The typical bill comparisons resulting from these rates are summarized in Table 11-1 below.

Table 11-1 Customer Bill Impacts: Private Ownership versus Public Acquisition

(1,000 gallons)	(HCF)	(Private Ownership)	(Public Ownership)	(\$ Savings)	(% Savings)
0	0	\$ 140.40	\$ 130.56	\$ 9.84	7.01%
30	40	\$ 308.28	\$ 286.68	\$ 21.60	7.01%
60	80	\$ 476.16	\$ 442.80	\$ 33.36	7.01%
90	120	\$ 644.04	\$ 598.92	\$ 45.12	7.01%
120	160	\$ 811.92	\$ 755.04	\$ 56.88	7.01%
150	200	\$ 996.60	\$ 926.78	\$ 69.82	7.01%
180	240	\$ 1,248.48	\$ 1,161.02	\$ 87.46	7.00%
			Private	Public	
Quarterly Fixed Charge			\$ 35.10	\$ 32.64	
First Block Rate (0 to 48 HCF)			\$ 4.197	\$ 3.903	
Second Block Rate (over 48 HCF)			\$ 6.297	\$ 5.856	

Again, based on these assumptions, over the next four years (FY 2017 through FY 2020) the average rate for each of the ownership options are as follows (quarterly):

Continued Private Ownership (MWC)

Customer Service Charge -----\$41.65 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$4.978 per HCF

2nd Block (all use over 48 HCF) ----- \$7.468 per HCF

Public Ownership and Operation

Customer Service Charge -----\$36.65 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$4.381 per HCF

2nd Block (all use over 48 HCF) ----- \$6.572 per HCF

The typical bill comparisons resulting from these rates are summarized in Table 11-2 below.

Table 11-2 Customer Bill Impacts: Private Ownership versus Public Acquisition

(1,000 gallons)	(HCF)	(Private Ownership)	(Public Ownership)	(\$ Savings)	(% Savings)
0	0	\$ 166.60	\$ 146.60	\$ 20.00	12.00%
30	40	\$ 365.72	\$ 321.84	\$ 43.88	12.00%
60	80	\$ 564.84	\$ 497.08	\$ 67.76	12.00%
90	120	\$ 763.96	\$ 672.32	\$ 91.64	12.00%
120	160	\$ 963.08	\$ 847.56	\$ 115.52	11.99%
150	200	\$ 1,182.12	\$ 1,040.33	\$ 141.79	11.99%
180	240	\$ 1,480.84	\$ 1,303.21	\$ 177.63	12.00%
			Private	Public	
Quarterly Fixed Charge			\$ 41.65	\$ 36.65	
First Block Rate (0 to 48 HCF)			\$ 4.978	\$ 4.381	
Second Block Rate (over 48 HCF)			\$ 7.468	\$ 6.572	

Lastly, applying these assumptions, over the next four years (FY 2021 through FY2024) the average rates for each ownership option are as follows (quarterly):

Continued Private Ownership (MWC)

Customer Service Charge -----\$60.11 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$7.184 per HCF

2nd Block (all use over 48 HCF) ----- \$10.777 per HCF

Public Ownership and Operation

Customer Service Charge -----\$48.99 per Quarter

Uniform Volumetric Charges

1st Block (0 to 48 HCF) ----- \$5.855 per HCF

2nd Block (all use over 48 HCF) ----- \$8.783 per HCF

The typical bill comparisons resulting from these rates are summarized in Table 11-3 below.

Table 11-3 Customer Bill Impacts: Private Ownership versus Public Acquisition

[illegible]

As can be seen from Table 11-1, residential customers are estimated to pay annual bills that are approximately 7.0% lower with municipal control during the first two years after acquiring the water system. Also as can be seen from Table 11-2, residential customers are estimated to pay annual bills that are approximately 12.0% lower on average over the succeeding four years. And lastly, as can be seen from Table 11-3, residential customers are estimated to pay annual bills that are approximately 18.5% lower on average over the succeeding four years. Of course, the Town would not have to follow all of the assumptions used to make this comparison. In fact, the Town would have considerable latitude in shaping how various customer classes would contribute to rate revenues and how the rate structure within each class is designed. These options were described in Section 11-5 below.

Section 11.4 – Effect of Variations in the Rate of Growth of Revenue Requirements

While our estimate of the rate of growth of total revenue requirements (and hence, needed average annual rate increases) under continued private ownership is somewhat conservative (low estimate), it could be lower. If it turned out to be considerably lower, the analysis in this section could turn out to be different from reality. This difference could be significant if the rate of cost increases under the public option remained high in

comparison to lower than expected increases under the private option. For example, if the private option had an escalation rate of only 4% while the public option would have resulted in annual increases of 5% or more. This would be a very unusual outcome. However, because of its potential impact on the rate comparisons derived above the impact on rate projections was evaluated, and the results are presented here.

We tested four alternative cases. The results of each variation with a lower escalation rate of increase for the private option are listed in Table 11-5. This table shows the annual savings for each escalation rate tested at five year intervals starting in 2016. Each variation was run keeping all assumptions the same as the Base Case except for the level of annual escalation rate assumed for total private option total revenue requirements (total costs). The first line of savings repeats the level of savings under the Base Case for the four years indicated. Each successive line shows the annual savings with the private escalation percentage reduced by 0.5% (from the Base Case level of 5.0%). Thus, the second line of savings results from substituting a lower private escalation rate (4.5%) into the forecast model. The third line shows the results with the escalation rate set at 4.0%. And the fourth and fifth lanes show the results with the escalation rate set at 3.5% and 3.0%, respectively.

Table 11-5 Annual Savings

Escalation Rate Total Costs Private option	2016	2021	2026	2031
5% (Base Case)	\$638,000	\$1,650,000	\$3,100,000	\$5,720,000
4.5%	\$602,000	\$1,380,000	\$2,500,000	\$4,560,000
4.0%	\$566,000	\$1,100,000	\$1,900,000	\$3,500,000
3.5%	\$530,000	\$856,000	\$1,340,000	\$2,500,000
3.0%	\$494,000	\$603,000	\$790,000	\$1,560,000

As expected, the savings with each variation do not go down significantly in the first year shown (FY2016) because the compounding effect of a lower escalation rate doesn't begin to have a significant impact for at least 3 or 4 years. The reductions do increase significantly over time with each variation. However, even for the last variation

(escalation Rate at 3.0%) the annual savings remain significant. At the 3.5% rate they are reduced by about 50% each year, except for 2016 (where the reduction is only about \$100,000 or 16%). For example, in 2021 they are decreased from \$1.65 million to \$1.3 million. At a rate of 3.5% they are reduced by about 66%. For example, by 2021 they are decreased from \$1.65 million to \$0.856 million. At 3.0 % they are reduced by more than 67%. From this analysis it is clear that unless our assumption on the relative rates of escalation under each ownership option is off by a significant margin there will remain significant savings under the public option. Furthermore, as stated above, it is very likely that if the escalation rate under either option turns out to be lower than expected, that the escalation rate for the other option would change in the same direction. For example, if it turned out that the escalation rate for the private option turned out to be 20% lower than expected (4.0% instead of 5.0%), then it is very likely that the escalation rate for the public option would also turn out to be significantly lower than estimated (perhaps 4.5% or even 3.5%).

Table 11-6 shows the corresponding results for the same analysis described above, but lists the percentage savings with each variation for the same five year intervals.

Table 11-6 Annual Percent Savings

Escalation Rate Total Costs Private option	2016	2021	2026	2031
5% (Base Case)	8.4%	17.2%	23.8%	34.5%
4.5%	8.0%	14.7%	20.0%	29.6%
4.0%	7.6%	12.2%	16.0%	24.3%
3.5%	7.1%	9.7%	11.7%	18.6%
3.0%	6.7%	7.0%	7.3%	12.5%

These percentage savings correspond to the annual reductions in rates that could be passed on to ratepayers under the public option. Again, the reductions remain significant for each of the alternative cases. Even at 3.0% the potential reductions in rates are still significant throughout the forecast period. As explained above, however,

such a circumstance without some reduction in the escalation rate for the public option is very unlikely.

Section 11.5 – CLASS ALLOCATION AND RATE STRUCTURE FLEXIBILITY WITH MUNICIPAL CONTROL

In addition to the economic advantage estimated for municipal ownership under base case assumptions (and many sensitivity cases with somewhat less advantageous assumptions), the Town would also have direct control over class allocations and rate design considerations. With this flexibility, the Town could lower the rate impacts to certain classes or certain levels of use within each class. For example, the Town could adjust downward the break point between the rate blocks for residential customers. This could significantly reduce the bill impacts to a much larger number of customers whose use is almost entirely for indoor (essential) use. Additionally, the Town could take measures to at least partially levelize rate increases in the early years through subsidies that could be recovered in later years as the savings begin to accelerate.

SECTION 12 – SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SECTION 12.1 – INTRODUCTION

The purpose of the study was to analyze both the economic and non-economic impacts of municipal acquisition along with the financial capability of the Town and to present a comparison of projected water rates under both Town and continued private ownership. This section presents our findings and conclusions based on a comprehensive study designed to provide the Town with information needed to make an informed decision about acquiring the privately owned water supply and distribution system assets within the Town's borders. Our evaluation focused on two key questions. First, what price will the Town be required to pay the Company for the acquisition of its water system assets in Milford? Second, what is the impact on ratepayers of municipal ownership?

The remainder of this section is organized to follow the same sequence as the numbered sections of the report starting with Section 2.

SECTION 12.2 – RATES IN MILFORD AND COMPARABLE COMMUNITIES

Our analysis of current charges for water service in Milford compared average annual rates for three customer classes in Milford with those of 29 similar communities. We determined that the typical annual bill in Milford is significantly higher than in the surrounding communities across a wide range of usage levels. Based on the latest rate case, it is clear the Milford Water Company intends to propose significant rate increases every two years for the foreseeable future.

SECTION 12.3 – MUNICIPAL ACQUISITION: INSTITUTIONAL AND LEGAL ISSUES

This section presents the findings and opinions of the Town's legal Counsel relative to the Town's authority to acquire the assets of the private water Company currently serving many residents and business in Milford, along with related legal and institutional

matters associated with such an acquisition. Counsel's position relative to these matters is summarized as follows:

- The Town has a statutory right to purchase the Company, if two-thirds of the voters favor the purchase. Once that vote is taken, the Town may be compelled to move forward with the acquisition;
- If the Company and the Town agree to the terms of the acquisition, no judicial/regulatory action is required;
- Should the Town and the Company be unable to agree on the property to be purchased and/or the value for that property, the Town (or the Company) can petition the Supreme Judicial Court ("SJC") to resolve the issues;
- The Court will, in turn, delegate its authority on this matter to the Department of Public Utilities ("Department"), which will make the requisite findings and determination;
- In evaluating what constitutes the property to be purchased, the Department will likely require the sale to include all of the Company's property and franchise rights, including intangible assets, such as reports prepared for capital improvements that were not undertaken, customer records, water quality records, maintenance records, trained workforce and possibly outstanding debt;
- Given the lack of specificity in Milford Water's charter, there is a substantial likelihood that the Company's property will be valued, in whole or in part, at the fair market value using Reproduction Cost New Less Depreciation (RCNLD). The Department may also consider the book value of the Company's property through Original Cost Less Depreciation ("OCLD");
- Per Milford Water's charter, the Department's decision must be "accepted" by the SJC, which typically is attained if no party appeals the Department's decision within 20 days of its service, or at the time that the SJC issues its decision. If a

party does appeal the decision, it is likely that the SJC would employ the standard of review for appeals of other Department decisions pursuant to G. L. c. 25, §5.⁶

SECTION 12.4 – ADVANTAGES AND DISADVANTAGES

The primary advantages associated with municipal control are: greater control of rates and potentially lower rates for water service, direct control of management and operations, and direct control over quality of service and customer relations. The primary disadvantages are: greater financial risk, responsibility for all service issues (double edged sword), and loss of State oversight regulations with respect to rates and consumer protection.

The Town (officials and customers) must weigh these factors and decide if the advantages outweigh the disadvantages. It may be that the economic advantages are great enough that they far outweigh any of the disadvantages. On the other hand, if the economic advantages are close or only favor municipal control by a relatively small amount, the other non-economic factors may play an important role in the decision process.

SECTION 12.5 – DESCRIPTION OF EXISTING WATER DISTRIBUTION SYSTEM

A system description was presented, including sources of supply, treatment facilities, distribution and storage. A system evaluation followed, which examined existing demand conditions and demand projections completed by the Massachusetts Department of Conservation and Recreation (DCR).

⁶ There is no precedent for the interpretation of the SJC review of the Department's ruling pursuant a municipal water company's charter and/or G.L. c. 165, § 5.

A comprehensive evaluation of the water system's facilities was recently completed by Tata and Howard, Inc. We relied heavily on this study to determine the additional capital improvements needed over the next 20 years. If the Town is not satisfied with that Company's evaluation of any of the assets reviewed by that Company, it should take measures to have those facilities fully evaluated by another consulting engineer before a final determination is made to proceed with acquisition. Additionally, because three years have elapsed since completion of that study, the Town should have an engineering evaluation performed on any additions, betterments and retirements that have taken place since that study was completed.

SECTION 12.6 – ACQUISITION PRICE ESTIMATE

The acquisition price is critical to the decision facing the Town in that its magnitude is likely to be the predominant factor in the evaluation. This estimate is a key input to the financial forecast model used to evaluate the Town's projected cost of operating the water system. As pointed out by Special Counsel, and as summarized in Section 3, the likely range of purchase prices that the Commission would consider approving is bounded on the low end by the Original Cost Less Depreciation (OCLD) value, and on the high end by the Reproduction Cost New Less Depreciation (RCNLD) value. To be conservative, we used the midpoint value of these two extremes for the base case in our analysis, and included a sensitivity case in Section 10 that assumes the Department approves the high end of the range. The base case estimated purchase price for our analysis is \$44 million.

SECTION 12.7 – FUNDING THE COST OF ACQUISITION AND SYSTEM IMPROVEMENTS

We have assumed that the funds needed for the system purchase (approximately \$44 million plus a mark-up of 1.5% to cover issuance costs) will be provided from the issuance of new debt. These funds will be provided from General Obligation Bonds with level principal payments at an interest rate of approximately 3.5%.

Upon acquisition, the Town will also need to plan for and implement several capital improvement projects in order to improve the core distribution system and address the other deficiencies identified by Tata & Howard. These improvements are fully described in Section 5. Phase I improvements should commence shortly after the acquisition and be funded through a combination of a second debt issue (approximately \$2.4 million) and R&R funds. Phase II improvements will be funded through a bond issue in 2023 of approximately \$8 million.

SECTION 12.8 – OPERATIONS AND MAINTENANCE COSTS

We applied three methods to estimate the total O&M costs under the municipal ownership scenario. These included a national (AWWA) survey, direct comparisons with five other Massachusetts community water systems, and an estimate of an outsourced operations contract. The average of the three cost estimates was \$2.64 million. To be conservative, we used the estimate from the contract O&M service provider (\$2.7 million) in the base case of our feasibility model. For comparison purposes, the Massachusetts Department of Public Utilities (MDPU) approved MWC to recover a total of \$2,849,178 in O&M costs for FY2014.

SECTION 12.9 – TOTAL COSTS AND REVENUE REQUIREMENTS

A spreadsheet model was developed to estimate the costs of providing service under municipal ownership starting in 2015 to compare the total revenue requirements of a Town-owned system versus what they would be under continued ownership by a private company. The results for each component and totals under both ownership options are provided in Section 9.

Also estimated in this section were the total revenue requirements associated with continued private control. From this we derived the difference between the level of rate revenues required under municipal ownership and operation versus continued private ownership. From this analysis it was determined the total cost associated with

municipal ownership and operation is likely to be significantly less than it would be under continued private control. Under the base case assumptions, in the first two years (2015-2016) under public ownership and operation, customers would pay about 7% less (on average) than they would have under continued private ownership and operation. Over the next 8 years (2017 through 2024) customer savings are projected to rise consistently from 11% to almost 20%. By the end of the forecast period, savings are projected to reach nearly 40% when compared to the rates they would pay if the utility remained under private control.

SECTION 12.10 – SENSITIVITY ANALYSIS

The sensitivity cases (or scenarios) presented in this Section tested the following key variables:

- Purchase Price
- Operation & Maintenance Costs – Base Year Value (Public Utility)
- Bond Interest Rate (Public Borrowing)
- Multi-variable Cases

The relative economics of municipal acquisition versus continued private control is sensitive to the three key factors tested individually. The feasibility model is relatively sensitive to variations in some of these factors, and relatively insensitive to others. However, the assumed values for each of these factors would have to be off considerably after the fact to result in a situation where acquisition by the Town would not be feasible from an economic point of view.

SECTION 12.11 – CUSTOMER IMPACTS

Because total costs are expected to be considerably less under municipal control, the rates charged to all customers should be lower than they would be under private ownership. Residential customers are estimated to pay annual bills that are approximately 7.0% lower with municipal control during the first two years (FY 2015 and FY2016) after acquiring the water system. In the four succeeding years (FY2017 through

FY2020), residential customers are estimated to pay annual bills that are approximately 12.0% lower on average. And lastly, residential customers are estimated to pay annual bills that are approximately 18.5% lower on average over the succeeding four years (FY 2021 through FY2024). Even if total costs with continued private control do not escalate as predicted in the Base Case scenario, the annual savings when compared to the private option will continue to be significant, unless the Base Case assumptions about the relative escalation rates are way off in opposite directions. And, such a scenario is very unlikely to occur.

The Town could decide to adopt the same rate structure and class contributions that the Company currently has in effect. However, if the Town did take over the water system, it would not be bound by the same rate structure or class allocations that were approved at the conclusion of MADPU 12-86. Indeed, its cost structure and rate design preferences are likely to diverge considerably from those that the Company currently has in effect.

SECTION 12.12 – Bottom Line

Based on our comprehensive evaluation of the Town acquiring this system and the range of potential impacts that could result from this action, we have reached the following major findings and conclusions.

- The Town of Milford has the legal authority and appears to have the financial capability to acquire the assets and franchise rights of the privately held water system within its borders.
- If the Town decides to make this acquisition, it is likely that the rates charged to its residents and businesses will be significantly lower than they would have been under continued private control, particularly over the long run.
- Because a Town vote to purchase the water system may be binding, the Town should, before taking such a vote, become aware of the likely costs and benefits

of a decision to purchase, and to the extent possible, ascertain the likely principles and cost approach the Department will rely on if their involvement is required.

- The Acquisition Price is likely to fall within the range established on the low side by application of the Original Cost Less Depreciation (OCLD) method of determining value and on the high side by application of the Reproduction New Less New Less Depreciation (RCNLD) method of determining value. Due to the fact that the current private Company will have no remaining ratepayers if the acquisition takes place (as they will all become customers of the Town owned system), it is likely that the acquisition price (as determined by the MDPU), will not greatly exceed the midpoint value based on those two valuation methods, and may be based primarily on the OCLD method.
- Because of the importance of the purchase price in the financial evaluation of the Town's decision to acquire this water system and the uncertainty associated with the RCNLD value, we recommend that the Town contract a qualified firm to perform a comprehensive appraisal of the RCNLD value of this water system before it takes a vote on whether it should acquire these assets.
- From discussions with Town Officials we are not aware of any non-economic disadvantages that they are not aware of, or that they view as being significant enough to outweigh the potential economic advantages.

APPENDIX A

Memo

Memorandum



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DATE February 20, 2014

TO Gerard M. Moody, Town Counsel
Town of Milford

FROM BROWN RUDNICK LLP

RE **PRIVILEGED AND CONFIDENTIAL ATTORNEY/CLIENT COMMUNICATION**
Potential Acquisition of Milford Water Company

I. Introduction

Brown Rudnick appreciates the opportunity to provide the Town of Milford (the "Town") with an analysis on how best to navigate the regulatory process relating to the potential acquisition of the Milford Water Company ("Milford Water" or the "Company"). This Memorandum describes the (1) the judicial/regulatory process that the Town would likely need to adhere should it go forward with the purchase; (2) the evidence that the Department would likely evaluate to make its determination on the property available and the value of that property; and (3) the mechanism and standards that the Department would likely rely on to make its determination.

As detailed herein:

- the Town has a statutory right to purchase the Company, if two-thirds of the voters favor the purchase. Once that vote is taken, the Town may be compelled to move forward with the acquisition;
- if the Company and the Town agree to the terms of the acquisition, no judicial/regulatory action is required;
- should the Town and the Company be unable to agree on the property to be purchased and/or the value for that property, the Town (or the Company) can petition the Supreme Judicial Court ("SJC") to resolve the issues;



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- the Court will, in turn, delegate its authority on this matter to the Department of Public Utilities ("Department"), which will make the requisite findings and determination;



- per the charter, the Department's decision must be "accepted" by the SJC, which typically is attained if no party appeals the Department's decision within 20 days of its service, or at the time that the SJC issues its decision. If a party does appeal the decision, it is likely that the SJC would employ the standard of review for appeals of other Department decisions pursuant to G. L. c. 25, §5.¹

II. The Town's Right to Purchase

On March 9, 1881, the Massachusetts legislature voted to incorporate the Company "for the purpose of furnishing the inhabitants of Milford with pure water for the extinguishments of fires, and domestic and other purposes . . ."² The Milford Water

¹ There is no precedent for the interpretation of the SJC review of the Department's ruling pursuant a municipal water company's charter and/or G.L. c. 165, § 5.

² St. 1881, c. 77 ("Milford Water Charter").



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Charter also gives the Company the right to set rates and collect revenues.³ Per the legislation, and as detailed below, the Town has the right to purchase the Company.⁴

"The town of Milford shall have the right at any time during the continuance of the charter hereby granted, to purchase the corporate property and all the rights and privileges of said company at a price which may be mutually agreed upon between said corporation and the said town of Milford; and the said corporation is authorized to make sale of the same to said town."

Accordingly, as long as the Company's Charter remains in existence, the Town has a right to purchase the Company's property.

A. *The Town's Assent to the Purchase*

The Milford Water Charter conditions the Town's authority to purchase the Company upon "the approval by a two-thirds vote of the voters present at a meeting called for this purpose."⁵ By such a vote, the Town affirms its intention to purchase the Company and avails itself of its right to have the price fixed in the manner set forth in the charter. Importantly, once the Town votes to purchase the Company, the Town is committed to do so.⁶

Like the Milford Water Charter, Cohasset's governing charter also conditioned the town's right to purchase on the two-third vote of the voters. In Cohasset, the court found that once the town had received authority through a properly held vote, the town had exercised its option to purchase the water company and could not rescind without the consent of the water company.⁷ The Court went on to hold that title did not pass by the town's vote, but that title passes only upon the execution of the proper conveyance and payment of price, to be ascertained in accordance with the governing charter.⁸

³ Milford Water Charter §4.

⁴ *Id.* at §9.

⁵ *Id.*

⁶ *Cohasset Water Co. v. Town of Cohasset*, 321 Mass. 137, 142 (1947) ("*Cohasset*"); see also *Dedham Water Company v. Dedham*, 395 Mass 510 (1985) ("*Dedham*") (the town vote to acquire only certain portions of Dedham Water Company was held ineffective as it differed materially from the Company's offer to sell).

⁷ *Cohasset* at 149.

⁸ *Cohasset* at 143.



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B. The Town and the Company Agree on Property to be Purchased and the Price

If the Town and the Company are able to agree on the property included and the price (either outright or through arbitration/mediation) and the Town acquires the requisite authority to purchase the Company, no other judicial or administrative approval is necessary for the sale to be consummated.

C. The Town and the Company Cannot Agree on the Property to be Purchased or the Price

If the two entities are unable to agree on the property to be purchased or price, then the Milford Water Charter provides that

the compensation to be paid shall be determined by three commissioners to be appointed by the supreme judicial court upon application of either party with proper notice to the other, whose award, when accepted by said court, shall be binding upon the parties.¹⁰

Thus, in the event that the parties cannot agree on price, either party has the right to file an application before the SJC requesting that in accordance with G.L. c. 165, §5, which describes the current procedures for water companies with municipal water purchase rights within their charter, the matter be referred to the Department to determine the property to be purchased and the value of the property.

¹⁰ Milford Water Charter §9. Massachusetts G.L. c. 165, §5 specifies that if a water company's legislative charter has a provision referring to the "Commission" to determine the price, the Department of Public Utilities is considered to be that Commission. See also *Cohasset, supra*.



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The Milford Water Charter states that the Department's decision is binding once it has been accepted by the SJC. The meaning of the term "accepted" is not clear. Arguably, SJC acceptance occurs in accordance with the standard rights of appeal of Department's decisions.¹¹ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

III. Judicial/Regulatory Process

A. Application to Commence Proceeding

Should the Town (or the Company) decide to seek a judicial/regulatory determination of the property to be purchased and its price, the moving party must petition the SJC and provide proper notice of its petition.¹²

In accordance with G.L. c. 165, §5, the SJC will refer the matter to the Department to determine the property to be purchased and the value of the property. The SJC has held that Department's decision must be determined using "wholly judicial methods," meaning that the Department will not conduct its own investigation, but will rely only on evidence presented to it by the parties.¹³ Department procedures typically involve the submission of prepared written testimony followed by discovery and then evidentiary hearings. Written discovery would address issues such as the property to purchase and its value. The Department will then conduct a public hearing in Milford, discovery will be propounded (likely over two to three months), followed by evidentiary hearings (4-6 days over two weeks) and briefing.

¹¹ An appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. G.L. c. 25, § 5.

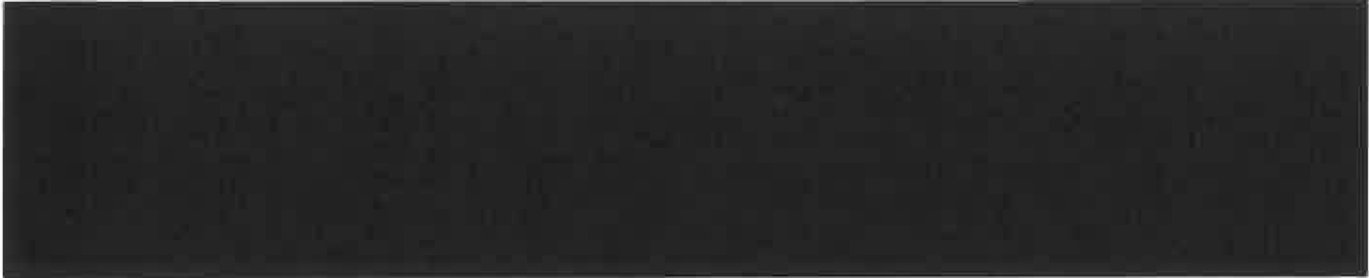
¹² The application to the SJC would consist of the filing of one original petition or application, together with the requisite filing fee of \$315.00. Although the Milford Water Charter does not define "proper notice", we can assume that service of the petition to the SJC would be deemed proper notice to the Company. All pleadings filed in the single justice session may be served by first class mail, hand delivery or, in the case of emergencies, via facsimile. We might also arrange for formal service.

¹³ *Cohasset* at 148-149.



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There is no deadline by which the Department must issue a decision; it could be six months from SJC transfer to issuance of a decision. Please note that the Attorney General would likely seek to participate in the proceeding and could seek funding for retaining her own expert analyses.¹⁴



B. Determination of Property Available for Purchase

The Milford Water Charter provides that the Town has the right to purchase "the corporate property and all the rights and privileges of said company."¹⁵ Therefore, the Department would have to determine what property rights and privileges are to be included in the sale of the Company to the Town.¹⁶ To make a finding as to what constitutes "property," the Department would likely be guided by how the Department and courts have interpreted other water company charters.¹⁷


In *Dedham Water Company v. Dedham*,¹⁸ the Town of Dedham sought to purchase a portion of the Dedham Water Company pursuant to the rights granted to it under St. 1876, c. 138, §10 ("Dedham Water Charter"), which gave the Town of Dedham the "right at any time during the continuance of the charter . . . to purchase the corporate property and all the rights and privileges of said company at a price which may be mutually agreed upon between said corporation and the said town of Dedham." In this



¹⁵ Milford Water Charter §9.

¹⁶ If the parties agree to what is included in the sale, it is likely that the Department will defer to that definition of "the corporate property and all the rights and privileges of said company." See *Petition of Stow Municipal Electric Department*, D.P.U. 94-176 at 3 (February 16, 1996) ("Stow").

¹⁷ In *Stow*, the Department looked to the governing statute and rules of statutory construction, judicial interpretations in analogous context in finding that "property" can be broadly construed to encompass every type of property, including tangible and intangible property, such as contracts. The Department then went on to find that certain power sales agreements and stranded costs related to the cost of power supply should not be included in the valuation of the company. These findings were the subject of appeal and reversal by the SJC. See *Stow Municipal Electric Department v. Dept. of Pub. Utilities*, 426 Mass 341 (1997).



¹⁸ *Dedham*, *supra*.



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instance, the Town of Dedham sought to purchase only the parts of the Dedham Water Company that fell within the town limits and not the portions of the water company that lie within the Town of Westwood.

In interpreting the Dedham Water Charter, the court found that the plain language of the charter meant that Town of Dedham was compelled to purchase all of the company property regardless if it was within the town limits.¹⁹ Consequently, as part of its due diligence into purchasing the Company, Milford should analyze the Company's property, both tangible and intangible, without regard to location.

In the *Town of Oxford v. Aquarion Water Company of Massachusetts, Inc.*,²⁰ the Charter allowed Oxford to purchase the franchise, property, rights and privileges of Aquarion -- all at actual cost. Thus, Aquarion argued that it should be entitled to "good husbandry expenses" and intangible assets. Included in these assets were fire hydrants, customer records, water quality records, maintenance records, its trained workforce and reports and studies not leading to capital improvements, etc.²¹

The Superior Court ruled that Aquarion was entitled to be paid for intangible assets, such as for two studies and overhead expenses incurred on capital projects. Moreover, the Court found that Aquarion could recover reasonable overhead expenses incurred in maintaining the system so that the purchaser will acquire a going concern in full operation.²²

¹⁹ *Id.* at 518.

²⁰ *Town of Oxford v. Aquarion Water Company of Massachusetts, Inc.*, No. 09000592 and No 09-01496 (Ma. Sup. Ct, November 4, 2013). ("*Oxford*") This matter first came before the court pursuant to motions for declaratory judgment as to the interpretation of the enabling statues. The Oxford Charter did not provide for a referral by the SJC to the Department for price determination.

²¹ *Id.* at 12.

²² In *Oxford*, the court defined "good husbandry" to mean the obligation of the company to turn over the company's franchise and property as a going concern in full operation, noting that a necessary public service should not suffer during a period of transfer. *Oxford* at 14 citing *Cohasset* at 147.



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C. Valuation of the Company's Property

The Milford statute provides no guidance on how the Department should value the Company's assets. Unlike other water company statutes enacted at the time that Milford became effective, there is no directive to value the assets based upon "actual costs"²⁴ or, in the case of other utilities, the "public interest".²⁵

Given that there is no existing precedent for the Department's valuation of purchase by a municipality of its water company and no clear direction within the Milford Water Charter, the Department likely will rely on utility-industry case law or judicial rulings as guidance to establish the Company's value.

The courts have issued declaratory rulings interpreting specific language in the enabling charters of two municipal water companies. The charters for the Southbridge Water Company and the Oxford Water Company were both established in the same time period as the Milford Water Charter. Unlike the Milford Water Charter, both charters used "actual cost" as a qualifier for price of the water company. In the recent *Oxford* case, the governing Charter provided the town to "take by purchase . . . the franchise, property, rights and privileges of the water company 'on payment of the actual cost thereof'" and five percent per annum net return on stockholder investment.²⁶ The *Oxford* Court defined "actual cost" to mean "original cost, the amount of money originally paid, as distinguished

²⁴ See *Town of Oxford v. Oxford Water Co.*, 391 Mass. 581, 586, 593 (1984).

²⁵ See *Stow*, *supra*.

²⁶ St. 1904, c. 193, §9.



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from any estimated cost, such as fair market value, or depreciated value."²⁷ Similarly, the Southbridge Water Company's charter gave the town the right to purchase "the corporate property and all rights and privileges of said company at the actual cost of same, or if mutually agreed upon . . . at a less price". In *Southbridge*, the court held "actual cost" to mean substantially the same terms as are employed regularly by the Department in determining rate base of the company and other regulated utilities . . . for rate setting purposes."²⁸

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

In *Stow*, the Department determined the value of an electric utility pursuant to G.L. c. 164, §§ 42 and 43²⁹ which give the town the right to purchase the electric utility and the Department the right to determine the purchase price of the municipal utilities' property. Unlike the Milford Charter, Section 43 sets forth a "public interest" standard for the Department's determination and other directives regarding the calculation of price, including a "reasonable allowance for depreciation and obsolescence, and any other element which may enter into the determination of a fair value of the property."³⁰

In *Stow* the parties advocated two distinct methods for the valuing the property: OCLD, which calculates the price based on historic numbers and RCNLD, which calculates the price based on the current cost to install these properties and then reduces the cost based on a realistic consideration of the condition of the properties.³¹

Essentially, OCLD is the net book value of the plant minus depreciation. To calculate OCLD, Stow Municipal Electric Department ("SMED") suggested that the Department establish a Company's original book value, its depreciation rate, and the year-end value of its distribution plant. SMED asserted that valuing a property for purchase is the same as valuing it for ratemaking purposes and argues that because

²⁷ *Town of Oxford v. Oxford Water Co.*, 391 Mass. 581, 586(1984) (citations omitted).

²⁸ See *Southbridge v. Southbridge Water Supply Co.*, 371 Mass. 209 (1976) ("*Southbridge*").

²⁹ Unlike Milford Water's Charter, Section 43 gives the town or the utility the right to directly petition the Department for a determination as to the property to be included and the price to be paid.

³⁰ See G. L. C. 164 § 43.

³¹ The income approach is the other generally accepted approach for valuation of real estate. The income approach is calculated using the net operating income of the rent collected and dividing it by the capitalization rate (the investor's rate of return). This approach is similar to OCLD or book value.

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utility rates in Massachusetts are based on the book value of the plant and that any amount that the purchaser paid over rate base would not earn a return. Therefore, SMED contended that a purchaser would not want to pay more for the plant than it could put into its rate base. SMED also argued that the plant had previously been paid for by the ratepayers and that any upward adjustment to the net book value of the system would result in ratepayers paying for the same plant more than once.³²

Contrary to SMED's position, Hudson Light & Power Department ("HL&P") argued that SMED should pay the fair value of the properties and defined fair value as "the price to which a willing buyer and willing seller would agree, neither being under the compulsion to act, with full knowledge with all relevant facts and acting at arms' length".³³ HL&PD asserted that RCNLD is a more appropriate indicator of value than OCLD, because it considers the current cost to install the properties and then reduces this cost based upon a realistic consideration of the condition of the properties at sale.³⁴ HL&PD maintained that the OCLD is more appropriate to use in setting rates and determining allowed rates of return because OCLD provides the historic value of the investment as it is found in the rate base of a utility, but not a proper method of valuation for a sale of the utility at fair value.

In *Stow*, the Department determined that it was in the "public interest" to consider how municipal utilities are valued outside of the rate making process, including mergers and acquisitions, eminent domain and tax assessment cases, all of which include elements of RCNLD. Therefore, the Department found that RCNLD must be taken into account to reflect the fair value of the property and held the valuation of the utility in *Stow* to be based on 50 percent of SMED's calculation of OCLD and 50 percent of HL&P's calculation of RCNLD.³⁵ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

³² *Stow* at 51-52.

³³ *Id.* at 53.

³⁴ *Id.* at 53-54.

³⁵ *Id.* at 66

[REDACTED]

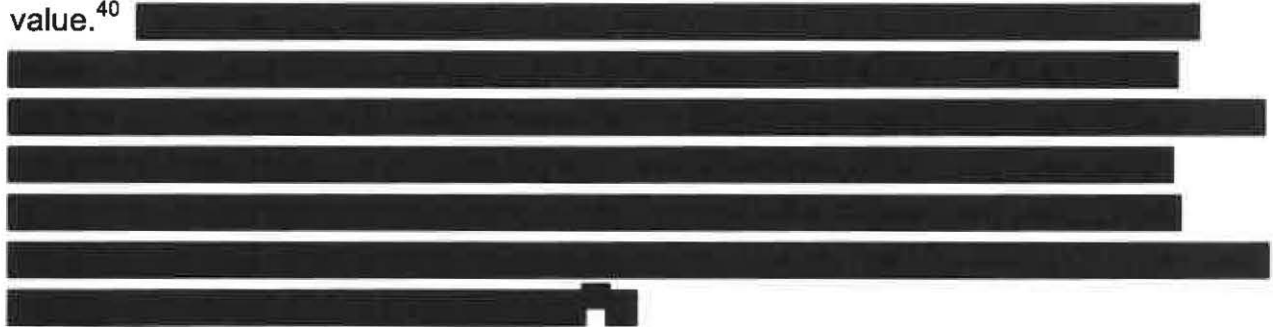


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1. *How would the Department likely value the Milford Water Company?*

We suggest that the Department would first be guided by the underlying purpose of the legislative intent. Section 9 of the legislation allows the Town of Milford the "right at any time to purchase the corporate property and all the rights and privileges of said Company at a price which may be agreed upon between the corporation and the Town of Milford" and if the parties cannot agree "the compensation to be paid shall be determined" by the Department. As in *Stow*, the Department would likely view the underlying purpose of the statute to be facilitating the town purchase of the utility at fair value.⁴⁰

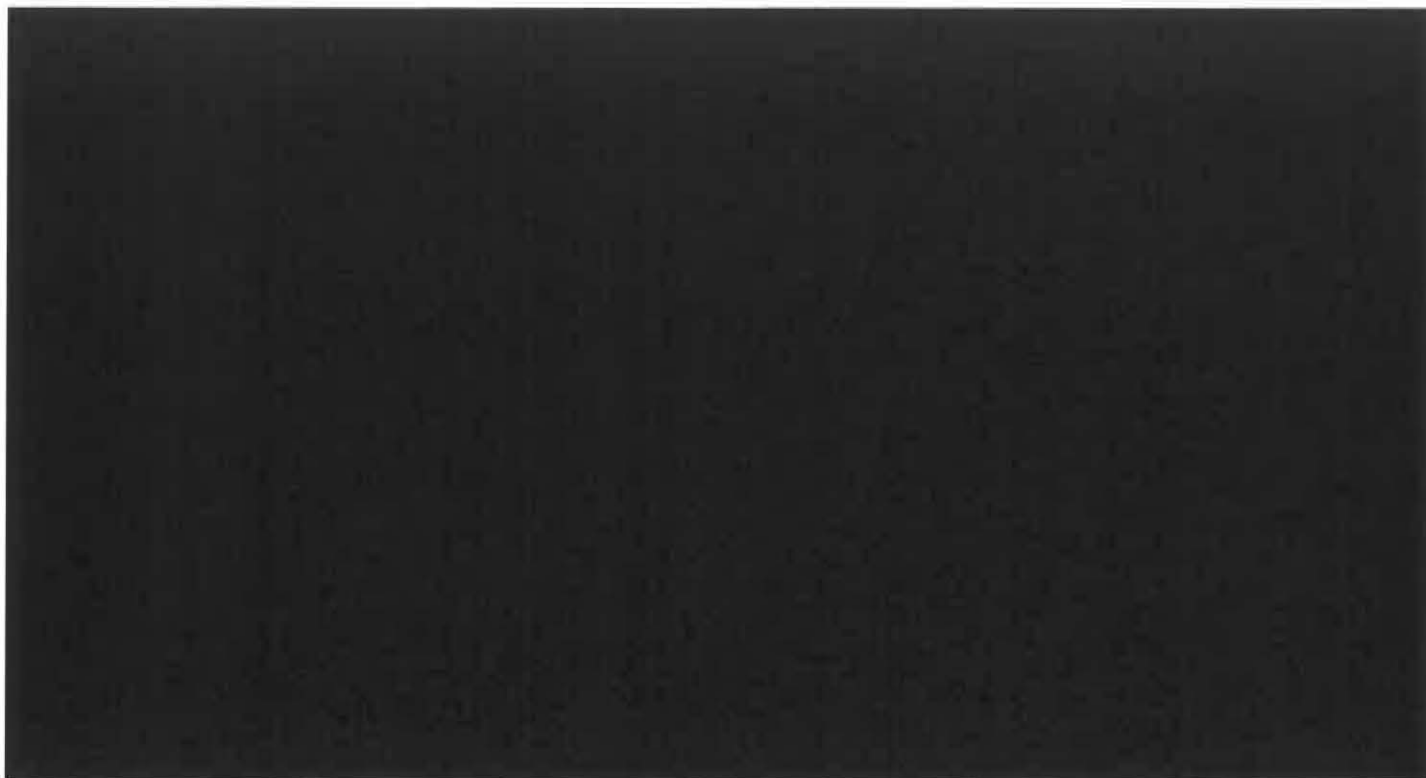


⁴⁰ *Id.* at 58.





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D. *Appeals to the SJC and Acceptance by SJC*

All Department decisions are subject to appeal to the SJC. If no party appeals the Department's decision within 20 days of service of the decision then the Department's decision stands. If a party does appeal the decision, it is likely that the SJC would employ the standard of review for appeals of other Department decisions pursuant to G. L. c. 25, §5.⁴³

Typically, the SJC "upholds the department's decision unless it is shown that it is based on an error in law, unsupported by substantial evidence, arbitrary or capricious, an abuse of discretion, or otherwise not in accordance with the law."⁴⁴ Once, the SJC has accepted the Department's determination that decision is binding on both the Town and the Company.

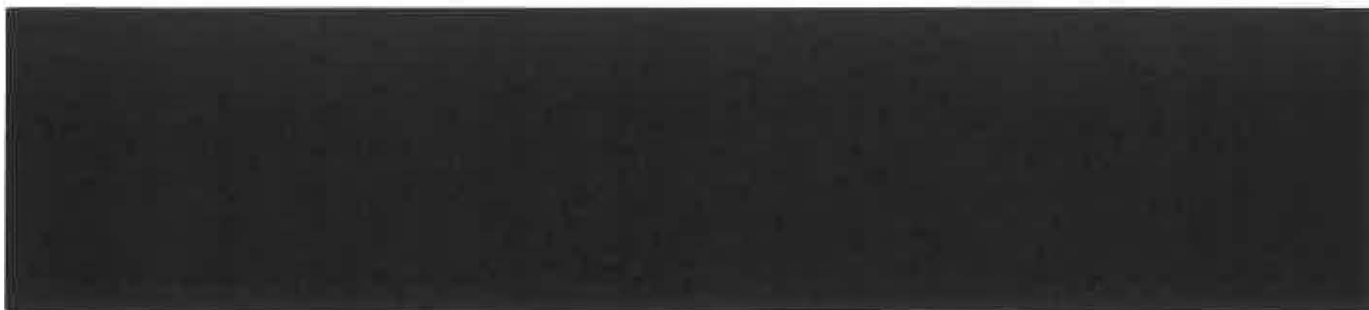


⁴³ There is no precedent for the interpretation of the SJC review of the Department's ruling pursuant to a municipal water company's charter and/or G.L. c. 165, § 5.

⁴⁴ Stow at 344; see also, *Attorney General vs. Dep't of Pub. Utilities*, 453 Mass. 191, 196 (2009) quoting *Fitchburg Gas & Elec. Light Co. vo. Dep't of Telecomm & Energy*, 440 Mass. 625, 631 (2004).



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We look forward to discussing these issues with you.

