

Town of Bethel, Connecticut  
Report - Water and Wastewater Rate Study  
December 6, 2007

### **A. Project Background and Goals**

The water and wastewater utility of Bethel, Connecticut needed a new set of rates that would enable them to meet rising operating and capital funding costs. Because Bethel's water and wastewater rates have not been adjusted since 1994, they were no longer generating adequate revenues and it was also suspected that they were out of sync with the underlying costs. Bethel hired Woodcock & Associates, Inc. to develop a financial planning and rate model and assist in designing an appropriate series of rate adjustments.

The rate study was intended to meet several goals.

- Determine the costs that must be recovered from water rates, wastewater rates, and fire protection charges over the next five years.
- Ensure that water, wastewater, and fire protection revenues are adequate to cover the costs of providing each of these services.
- Ensure that revenues are sufficient to meet short-term cash needs, debt service coverage requirements, and long-term capital funding demands while generating the fund balances required for the utility's financial stability.
- Provide a rate plan that is equitable and cost-justified while mitigating rate shock to the extent possible.
- Avoid unnecessary complexity in either the rate structure or the rate calculations.
- Follow a rate setting process that is consistent with industry conventions and guidelines set forth by the American Water Works Association (AWWA).

The following sections of the report explain the procedures followed to meet these goals, the findings of the analysis, and the final rate recommendations.

### **B. Cost Analysis Process**

Generally accepted industry practice and AWWA guidelines require that water and wastewater rates be cost-justified. This means that the rates charged for providing a specific utility service must be justified by the costs of providing that same service. Under this approach, water rates are only used to recover water costs, sewer rates only recover sewer costs, and so forth. Costs related to administration and overhead are split among utility functions using reasonable allocation bases. This cost-based approach helps improve the equity of the rates while providing improved financial stability.

In order to determine the costs that must be recovered from Bethel's rates, the following data was incorporated into a financial analysis.

- Water department budget
- Sewer department budget

- Five-year capital improvement program
- Existing debt service schedules, with water and sewer categorization
- Non-Rate revenue data for items such as installation fees, interest income, and other miscellaneous charges.

In order to estimate cost trends over the next five years, inflation escalators ranging from 3% to 8% were applied to each budget line item. Future payments on existing debt service were taken from preestablished debt payment schedules. A capital funding analysis was used to determine how much of future capital needs would be funded through rates (pay-as-you-go) versus new debt. Principal and interest payments on future debt service were estimated using reasonable assumptions for interest rates, debt terms, and issuance costs.

The financial analysis projected future costs of providing water and wastewater services. The cost of providing fire protection service was estimated by allocating a percentage of water costs to the fire protection function. The fire protection allocation percentage was determined by estimating the fire protection flow required to serve the population of Bethel and dividing this number into peak residential water demand. Fire protection costs were allocated between private and public fire connections on the basis of number of connections weighted by meter size.

A summary of utility costs is provided below.

### Exhibit 1. Total Operating and Capital Costs

|                         | FY 2008             | FY 2009             | FY 2010             | FY 2011             | FY 2012             |
|-------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Water                   | \$ 987,541          | \$ 1,124,809        | \$ 1,106,927        | \$ 1,239,917        | \$ 1,166,281        |
| Sewer                   | 2,003,716           | 2,023,307           | 2,072,750           | 2,130,263           | 2,218,144           |
| Public Fire Protection  | 254,603             | 290,984             | 286,087             | 321,323             | 301,586             |
| Private Fire Protection | 64,415              | 73,619              | 72,380              | 81,295              | 76,301              |
| Total Costs to Recover  | <b>\$ 3,310,275</b> | <b>\$ 3,512,719</b> | <b>\$ 3,538,144</b> | <b>\$ 3,772,797</b> | <b>\$ 3,762,313</b> |

In order to determine the net costs that must be recovered from rates, each pool of costs was netted against the miscellaneous revenues received from connection charges, interest income, and other miscellaneous fees.

## Exhibit 2. Non-Rate Revenues

|                                | FY 2008           | FY 2009           | FY 2010           | FY 2011           | FY 2012           |
|--------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <b><u>Water</u></b>            |                   |                   |                   |                   |                   |
| Fees and Charges               | \$ 362,389        | \$ 396,632        | \$ 415,599        | \$ 435,490        | \$ 435,778        |
| Non-operating Revenues         | 8,240             | 8,487             | 8,742             | 9,004             | 9,274             |
| <b><u>Sewer</u></b>            |                   |                   |                   |                   |                   |
| Fees and Charges               | 64,370            | 64,743            | 65,120            | 65,500            | 65,884            |
| Non-operating Revenues         | 175,100           | 180,353           | 185,764           | 191,336           | 197,077           |
| <b>Total Non-rate Revenues</b> | <b>\$ 610,099</b> | <b>\$ 650,215</b> | <b>\$ 675,225</b> | <b>\$ 701,331</b> | <b>\$ 708,013</b> |

Total utility costs less non-rate revenues equals the costs that must be recovered through rates in order for the utility to remain financially self-sufficient.

### C. Rate Structure

Bethel's water and sewer rates use a declining block rate structure for volume charges plus a quarterly minimum charge that covers all metered usage up to 6000 gallons per quarter. Minimum charges increase by meter size. Water minimum charges consist of a single chart component, while sewer minimum charges include both a debt service component and a minimum usage component. Sewer charges billed to customers are derived from the water charges as follows.

- The sewer minimum charge is equal to the greater of the sewer debt service charge or 1.20x the total water bill.
- The sewer volume bill is equal to the greater of the sewer minimum charge or 1.25x the total water bill.

A schedule of current water and sewer rates is provided in the following exhibit.

### Exhibit 3. Current Water and Sewer Rates

|                        | Water Rates                                      | Sewer Rates                             |                                   |                                         |
|------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|-----------------------------------------|
| <b>VOLUME CHARGES</b>  | For demand <6000 gals,<br>see min. charges below |                                         |                                   |                                         |
| 0-6,000 gals           |                                                  |                                         |                                   |                                         |
| 6,000-65,000           | \$ 2.10 per 1000 gallons                         | Sewer Charges = Water Rate x Multiplier |                                   |                                         |
| >65,000                | \$ 1.60 per 1000 gallons                         | Sewer Charges = Water Rate x Multiplier |                                   |                                         |
| <b>MINIMUM CHARGES</b> | Water<br>Minimum Charge                          | Sewer<br>Min Use<br>Charge              | Minimum<br>Debt Service<br>Charge | Charge<br>Total Sewer<br>Minimum Charge |
| Meter Size             |                                                  |                                         |                                   |                                         |
| 5/8                    | \$ 10.00                                         | \$ 20.00                                | \$ 19.00                          | \$ 39.00                                |
| 3/4                    | \$ 15.00                                         | \$ 40.00                                | \$ 38.00                          | \$ 78.00                                |
| 1                      | \$ 30.00                                         | \$ 80.00                                | \$ 77.00                          | \$ 157.00                               |
| 1.25                   | \$ 45.00                                         | \$ 100.00                               | \$ 96.00                          | \$ 196.00                               |
| 1.5                    | \$ 60.00                                         | \$ 100.00                               | \$ 96.00                          | \$ 196.00                               |
| 2                      | \$ 112.50                                        | \$ 188.00                               | \$ 180.00                         | \$ 368.00                               |
| 3                      | \$ 225.00                                        | \$ 375.00                               | \$ 360.00                         | \$ 735.00                               |
| 4                      | \$ 300.00                                        | \$ 500.00                               | \$ 480.00                         | \$ 980.00                               |
| No Meter               |                                                  | \$ 27.00                                | \$ 29.00                          | \$ 56.00                                |

Because sewer bills are directly tied to water bills, sewer revenues are strongly influenced by water rates. The strong linkage between water and sewer rates has several implications for financial planning and ratesetting. First of all, the relationship between sewer rates and sewer costs is weakened. This weakness reduces the defensibility of the sewer rates and their consistency with AWWA ratesetting guidelines. Secondly, the accuracy of sewer rate revenue projections is degraded because sewer bills are bracketed by their relationship with individual water bills. Utility management may wish to consider changing to a different rate structure in the next few years by removing the linkage between water and sewer bills.

#### D. Revenue Sufficiency

Rate sufficiency is measured by comparing rate revenues to the costs of providing the related services. Normally, the revenue analysis would multiply existing rates by metered demand and meter counts. The results of this calculation would then be compared to historical revenues in order to double check the accuracy of the analysis. However, the complex multiplier/bracketing mechanism built into the Bethel sewer rate structure makes this sort of direct revenue calculation infeasible. Instead, the revenue sufficiency analysis for this project must rely entirely on historical billing and revenue records.

A review of revenues generated by existing rates demonstrated that these rates were not sufficient to cover associated costs. This deficiency was particularly pronounced in the water function, which together with fire protection produces an estimated deficit of approximately a

quarter million dollars for fiscal year 2007. Without a rate increase, the total deficit for FY 2008 is projected to be nearly \$1 million.

### Exhibit 4. Projected Deficits With No Rate Increase

(in thousands of dollars)

|                              | FY 2007         | FY 2008         | FY 2009           | FY 2010           | FY 2011           | FY 2012           |
|------------------------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|
| <b>Water</b>                 | \$ (183)        | \$ (411)        | \$ (544)          | \$ (523)          | \$ (652)          | \$ (575)          |
| <b>Sewer</b>                 | 20              | (294)           | (301)             | (337)             | (381)             | (455)             |
| <b>Fire Protection</b>       | (98)            | (251)           | (296)             | (290)             | (334)             | (309)             |
| <b>Total Deficit</b>         | <b>\$ (261)</b> | <b>\$ (956)</b> | <b>\$ (1,140)</b> | <b>\$ (1,149)</b> | <b>\$ (1,367)</b> | <b>\$ (1,340)</b> |
| <b>Debt Service Coverage</b> | <b>0.30</b>     | <b>-0.21</b>    | <b>-0.32</b>      | <b>-0.47</b>      | <b>-0.62</b>      | <b>-0.79</b>      |

These deficits present challenges for both cash flow requirements and debt service coverage obligations. Only the sewer rates are currently producing enough revenues to cover their costs, and when the new debt service comes online in FY 2008 all functions will be deeply in the red unless significant rate increases are implemented.

#### E. Proposed New Rates

The revenue sufficiency analysis demonstrates that a significant rate adjustment is needed. The next step in the ratesetting process is to examine how different rate adjustments affect revenue sufficiency and debt service coverage. Normally, the preferred method of estimating future revenues would be to multiply projected rates by projected units of service. However, because sewer bills are based directly on water bills rather than on independent standalone sewer rates, this approach is not possible. Instead, future rate revenue must be estimated by multiplying existing rate revenues by proposed rate increase percentages.

The analysis assumes that no changes will be made in the existing rate structure. New rates must solve cash flow deficits as well as provide acceptable debt service coverage. The new rates should also provide sufficient cash to replenish fund balances needed for long-term financial stability. Finally, rates must recover the underlying costs of providing water and sewer services. In other words, each rate should cover the costs of related services without relying on subsidies from other rates. In order to mitigate rate shock, the recommended water and wastewater rates are phased-in at 20% per year. Private and public fire protection charges, however, are increased to cover their full costs in 2008 with no phased-in.

As shown in the following exhibit, customers can expect a 20% increase in their average bill for both FY 2008 and FY 2009. The average customer bill increase for FY 2010 and beyond will depend on whether or not Bethel decides to maintain the existing linkage between the water and sewer bills.

### Exhibit 5. Proposed Rate Increases

|                        | FY 2008     | FY 2009    | FY 2010    | FY 2011    | FY 2012    |
|------------------------|-------------|------------|------------|------------|------------|
| <b>Water</b>           | <b>20%</b>  | <b>20%</b> | <b>20%</b> | <b>10%</b> | <b>10%</b> |
| <b>Sewer</b>           | <b>20%</b>  | <b>20%</b> |            |            |            |
| <b>Fire Protection</b> | <b>400%</b> | <b>10%</b> | <b>5%</b>  | <b>5%</b>  |            |

Under the recommended rates, Bethel will achieve a reasonable debt service coverage ratio and eliminate their overall deficit by FY 2009. By FY 2010, it should be possible to begin rebuilding depleted fund balances. By FY 2012, each rate category is expected to be generating revenues adequate to cover costs of service. These projected results assume that rates will be implemented in such a way as to be in full effect for the entire fiscal year.

### Exhibit 6. Revenue Sufficiency under Proposed Rates

(in thousands of dollars)

|                                 | FY 2008     | FY 2009  | FY 2010  | FY 2011  | FY 2012 |
|---------------------------------|-------------|----------|----------|----------|---------|
| Water                           | \$ (303)    | \$ (304) | \$ (125) | \$ (157) | \$ 27   |
| Sewer                           | \$ (2)      | \$ 346   | \$ 313   | \$ 272   | \$ 201  |
| Fire Protection                 | \$ 21       | \$ 10    | \$ 35    | \$ 10    | \$ 35   |
| Total Revenue Surplus (Deficit) | \$ (283)    | \$ 51    | \$ 223   | \$ 125   | \$ 263  |
| <b>Debt Service Coverage</b>    | <b>0.75</b> | 1.24     | 1.40     | 1.44     | 1.47    |

Exhibit 7. Proposed FY 2008 Rates

|                        | Water Rates                                      | Sewer Rates                             |                     |                            |
|------------------------|--------------------------------------------------|-----------------------------------------|---------------------|----------------------------|
| <b>VOLUME CHARGES</b>  | For demand <6000 gals,<br>see min. charges below |                                         |                     |                            |
| 0-6,000 gals           | \$ 2.52 per 1000 gallons                         | Sewer Charges = Water Rate x Multiplier |                     |                            |
| 6,000-65,000           | \$ 1.92 per 1000 gallons                         | Sewer Charges = Water Rate x Multiplier |                     |                            |
| >65,000                |                                                  |                                         |                     |                            |
| <b>MINIMUM CHARGES</b> | Water                                            | Sewer                                   | Minimum             | Charge                     |
| Meter Size             | Minimum Charge                                   | Min Use Charge                          | Debt Service Charge | Total Sewer Minimum Charge |
| 5/8                    | <b>\$12.00</b>                                   | \$24.00                                 | \$22.80             | <b>\$46.80</b>             |
| 3/4                    | <b>\$18.00</b>                                   | \$48.00                                 | \$45.60             | <b>\$93.60</b>             |
| 1                      | <b>\$36.00</b>                                   | \$96.00                                 | \$92.40             | <b>\$188.40</b>            |
| 1.25                   | <b>\$54.00</b>                                   | \$120.00                                | \$115.20            | <b>\$235.20</b>            |
| 1.5                    | <b>\$72.00</b>                                   | \$120.00                                | \$115.20            | <b>\$235.20</b>            |
| 2                      | <b>\$135.00</b>                                  | \$225.60                                | \$216.00            | <b>\$441.60</b>            |
| 3                      | <b>\$270.00</b>                                  | \$450.00                                | \$432.00            | <b>\$882.00</b>            |
| 4                      | <b>\$360.00</b>                                  | \$600.00                                | \$576.00            | <b>\$1,176.00</b>          |
| No Meter               |                                                  | \$32.40                                 | \$34.80             | <b>\$67.20</b>             |

**F. Alternative Rate Scenarios**

In addition to the series of rate increases recommended above, several alternative rate increase scenarios were examined. These alternative scenarios are shown below for comparison purposes.

The purpose of rate scenario one was to eliminate deficits entirely during the very first year while increasing debt service coverage to at least 1.20. Unfortunately, this very aggressive approach would require a water rate increase of more than 75% in addition to a sewer increase of more than 20%. Such a drastic increase in customer bills is not recommended.

Exhibit 8. Alternative 1 Rate Increases

|                        | FY 2008     | FY 2009    | FY 2010   | FY 2011   | FY 2012   |
|------------------------|-------------|------------|-----------|-----------|-----------|
| <b>Water</b>           | <b>76%</b>  | <b>15%</b> | <b>5%</b> | <b>5%</b> |           |
| <b>Sewer</b>           | <b>21%</b>  |            | <b>5%</b> |           | <b>5%</b> |
| <b>Fire Protection</b> | <b>400%</b> | <b>9%</b>  | <b>5%</b> | <b>5%</b> |           |

### Exhibit 9. Revenue Sufficiency under Alternative 1

(in thousands of dollars)

|                                        | FY 2008      | FY 2009      | FY 2010       | FY 2011      | FY 2012       |
|----------------------------------------|--------------|--------------|---------------|--------------|---------------|
| Water                                  | \$ 1         | \$ 13        | \$ 92         | \$ 24        | \$ 104        |
| Sewer                                  | \$ 13        | \$ 8         | \$ 63         | \$ 20        | \$ 43         |
| Fire Protection                        | \$ 21        | \$ 7         | \$ 31         | \$ 7         | \$ 31         |
| <b>Total Revenue Surplus (Deficit)</b> | <b>\$ 35</b> | <b>\$ 28</b> | <b>\$ 186</b> | <b>\$ 51</b> | <b>\$ 178</b> |
| <b>Debt Service Coverage</b>           | <b>1.20</b>  | <b>1.21</b>  | <b>1.35</b>   | <b>1.34</b>  | <b>1.35</b>   |

The second rate alternative explored the consequences of limiting rate increases to 9.9%. This approach would minimize customer rate shock but would also cause severe problems with cash flow and debt service coverage. Therefore, rate alternative 2 is not fiscally responsible and is not recommended.

### Exhibit 10. Alternative 2 Rate Increases

|                        | FY 2008     | FY 2009     | FY 2010     | FY 2011     | FY 2012     |
|------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>Water</b>           | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> |
| <b>Sewer</b>           | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> |
| <b>Fire Protection</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> | <b>9.9%</b> |

### Exhibit 11. Revenue Sufficiency under Alternative 2

(in thousands of dollars)

|                                        | FY 2008         | FY 2009         | FY 2010         | FY 2011         | FY 2012        |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| Water                                  | \$ (357)        | \$ (431)        | \$ (344)        | \$ (400)        | \$ (242)       |
| Sewer                                  | \$ (149)        | \$ 5            | \$ 146          | \$ 300          | \$ 444         |
| Fire Protection                        | \$ (244)        | \$ (282)        | \$ (268)        | \$ (303)        | \$ (268)       |
| <b>Total Revenue Surplus (Deficit)</b> | <b>\$ (751)</b> | <b>\$ (708)</b> | <b>\$ (465)</b> | <b>\$ (404)</b> | <b>\$ (67)</b> |
| <b>Debt Service Coverage</b>           | <b>0.08</b>     | <b>0.25</b>     | <b>0.47</b>     | <b>0.71</b>     | <b>1.00</b>    |

### G. Summary

It is recommended that Bethel adopt the series of rate increases proposed in section E. These recommended rate increases cap water and sewer increases at 20% per year and eliminate the utility deficit by FY 2009. These recommended rate increases also achieve an acceptable debt

service coverage ratio by FY 2009. Fire line charges are increased during the first year to match fire service costs, while water rates reach parity with water costs in FY 2012.