

Exhibit D

City of Keene, New Hampshire

Water and Sewer Rate Study

May 1, 2006

FINAL REPORT



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May 1, 2006

Ms. Donna L. Hanscom
Keene Public Works Department
350 Marlboro Street
Keene, NH 03431

Subject: Water & Sewer Rate Study

Dear Donna:

Please find enclosed ten copies of the final report of the water and sewer rate study. After the financial and rate model training last month, the project has now been closed with the completion of the final report as the final deliverable. It has been a pleasure working with you and the entire working group over the study period. Please do not hesitate to contact me at heila@cdm.com or (617) 452-6335 with any questions about the study.

Thank you very much.

Very truly yours,

A handwritten signature in cursive script that reads "Alexander Heil".

Alexander Heil, Ph.D.
Management Consultant
Camp Dresser & McKee Inc.

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Section 1

Selected Rate Structure Alternative

CDM has completed a water and sewer rate study in cooperation with the working group of the City of Keene. The purpose of this document is to present the results of this study as well as the recommended and adopted rate structures for both the water and sewer utilities. This section of the report presents the recommended and adopted water and sewer rates while the body of the report also outlines the other alternatives that were considered.

For both water and sewer rates, the schedules have been modified in order to include a fixed fee based on debt service and varied by meter size. The volumetric rate is a constant charge per volume of consumption. Table 1 below shows the water rates both in the current fiscal year, FY 2005, and a six-year projection.

Meter Size	Current	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
WATER 5/8"	\$25.47	\$22.06	\$22.06	\$22.06	\$22.06	\$22.06	\$22.06
WATER 3/4"	\$25.47	\$31.77	\$31.77	\$31.77	\$31.77	\$31.77	\$31.77
WATER 1"	\$57.65	\$56.48	\$56.48	\$56.48	\$56.48	\$56.48	\$56.48
WATER 1 1/2"	\$136.72	\$127.08	\$127.08	\$127.08	\$127.08	\$127.08	\$127.08
WATER 2"	\$217.14	\$225.92	\$225.92	\$225.92	\$225.92	\$225.92	\$225.92
WATER 3"	\$542.86	\$508.31	\$508.31	\$508.31	\$508.31	\$508.31	\$508.31
WATER 4"	\$914.15	\$903.67	\$903.67	\$903.67	\$903.67	\$903.67	\$903.67
WATER 6"	\$1,906.04	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25
Volume Rate (\$ per hcf)	\$2.00	\$1.45	\$2.79	\$3.11	\$3.53	\$3.73	\$4.19

Table 2 shows the respective sewer rates over the same time period.

Meter Size	Current	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
SEWER 5/8"	\$25.85	\$13.31	\$18.06	\$24.24	\$34.69	\$38.18	\$42.33
SEWER 3/4"	\$25.85	\$19.16	\$26.00	\$34.90	\$49.96	\$54.98	\$60.95
SEWER 1"	\$25.85	\$34.07	\$46.23	\$62.05	\$88.81	\$97.74	\$108.36
SEWER 1 1/2"	\$25.85	\$76.65	\$104.02	\$139.61	\$199.82	\$219.90	\$243.80
SEWER 2"	\$25.85	\$136.26	\$184.92	\$248.20	\$355.24	\$390.94	\$433.43
SEWER 3"	\$25.85	\$306.59	\$416.08	\$558.46	\$799.28	\$879.62	\$975.22
SEWER 4"	\$25.85	\$545.04	\$739.70	\$992.81	\$1,420.95	\$1,563.76	\$1,733.72
SEWER 6"	\$25.85	\$1,226.35	\$1,664.32	\$2,233.83	\$3,197.14	\$3,518.46	\$3,900.86
Volume Rate (\$ per hcf)	\$2.59	\$3.54	\$3.82	\$4.49	\$5.04	\$5.04	\$5.13

In addition, the fire service charges were modified in order to capture the demand characteristics and the potential peak demand issues consistent with fire demand patterns. Table 3 shows the fire related charges.

	<u>Current</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>
PRIVATE FIRELINE 1 1/2"	\$75.00	\$28.90	\$31.77	\$34.59	\$43.75	\$43.75	\$54.35
PRIVATE FIRELINE 2"	\$100.00	\$51.37	\$56.47	\$61.50	\$77.77	\$77.77	\$96.63
PRIVATE FIRELINE 4"	\$150.00	\$205.48	\$225.90	\$245.99	\$311.08	\$311.08	\$386.51
PRIVATE FIRELINE 6"	\$200.00	\$462.34	\$508.27	\$553.47	\$699.93	\$699.93	\$869.64
PRIVATE FIRELINE 8"	\$250.00	\$821.93	\$903.58	\$983.95	\$1,244.33	\$1,244.33	\$1,546.03
PRIVATE FIRELINE 10"	\$300.00	\$1,284.27	\$1,411.85	\$1,537.42	\$1,944.26	\$1,944.26	\$2,415.67
HYDRANT	\$180.00	\$462.34	\$508.27	\$553.47	\$699.93	\$699.93	\$869.64

Modified rate schedules, especially when cost allocations are changed, will impact customers in different ways. Table 4 below shows the combined impacts on different customers based on varying consumption characteristics.

Average Household Annual Water Use (HCF)	<u>Current</u>	<u>FY06</u>	<u>FY07</u>	<u>FY08</u>	<u>FY09</u>	<u>FY10</u>	<u>FY11</u>
20	\$205.28	\$241.22	\$292.75	\$337.27	\$398.49	\$416.42	\$443.98
50	\$251.18	\$390.85	\$491.15	\$565.38	\$655.69	\$679.61	\$723.61
100	\$480.68	\$640.22	\$821.82	\$945.56	\$1,084.37	\$1,118.26	\$1,189.67
150	\$710.18	\$889.59	\$1,152.48	\$1,325.74	\$1,513.05	\$1,556.91	\$1,655.72
200	\$939.68	\$1,138.96	\$1,483.15	\$1,705.91	\$1,941.73	\$1,995.56	\$2,121.78

Larger meter sizes might even see different impacts as a result of the modified rate structures. Table 5 shows these average water and sewer rate projections.

Table 5 Average Combined Bill (large meter sizes)								
Average Annual Water Use (HCF)	Meter Size	Current	FY06	FY07	FY08	FY09	FY10	FY11
5000	1"	\$23,284	\$25,299	\$33,477	\$38,492	\$43,449	\$44,482	\$47,265
15000	2"	\$69,822	\$76,260	\$100,843	\$115,950	\$130,929	\$134,062	\$142,454
25000	3"	\$117,025	\$127,945	\$169,030	\$194,356	\$219,570	\$224,877	\$238,962
30000	4"	\$141,460	\$155,417	\$204,973	\$235,693	\$266,507	\$273,060	\$290,183
40000	6"	\$191,328	\$212,535	\$279,323	\$321,211	\$363,866	\$373,127	\$396,581

The City of Keene has taken an important step in retaining the financial self sufficiency of its water and sewer utilities. We recommend a further periodic review of the revenues generated within each fund and how the projected rate structures generate ample funding for operations and maintenance as well as the capital program. Changes in overall financial conditions, internal and external, will alter the financial assumptions retained in CDM's projections. Hence, a continuous monitoring of the financial posture of both the water and sewer utility is necessary.

Section 2

Assumptions

The analyses presented in this report follow principles recommended by the American Water Works Association (AWWA) and the methodologies outlined in its rate manual M1. In addition to the standard rate-making principles, we have relied on a comprehensive set of assumptions. The assumptions are outlined below:

- The financial projections are based on the FY2005 water and sewer operating budget.
- Operating expenses are inflated using a cost escalation factor of 7.4 percent. The escalation figure was recommended by City staff based on an analysis of historical water and sewer O&M expenditures.
- The capital programs for both water and sewer are presented in Tables 5 and 6.

Table 5							
WATER FUND CAPITAL PROGRAM							
In FY2005 dollars	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11
<u>CAPITAL PROGRAM</u>							
Reserve: Water Treatment Facility	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
Reserve: Water Infrastructure	350,000	380,000	380,000	380,000	380,000	380,000	380,000
Water Distribution Improvements	356,000	522,500	300,000	400,000	332,348	250,000	1,209,593
Atomic Absorption Unit Disinfection By-Product Equipment	37,000 48,933						
SCADA Replacement		292,868					
Woodward Intake Construction Disinfection By-Product Equipment	25,000						
Hydrant Replacement		62,500	64,469	66,500	68,594	70,755	72,984
Railroad Property Support		287,949	136,807				
Water Storage Tank Upgrade			65,335				
Water Valve Replacement		66,000	67,650	69,340	71,070	72,850	74,670
Well Water Treatment			575,800	4,870,200			
SUBTOTAL - APPROPRIATION	\$861,933	\$1,951,282	\$1,635,061	\$5,831,040	\$897,012	\$818,605	\$1,782,247
USE OF CAPITAL RESERVE	393,000	815,368	300,000	400,000	238,000	250,000	650,000
USE OF RATE REVENUE	\$468,933	553,500	622,454	560,840	659,012	568,605	1,132,247
BOND FUNDED	\$0	\$582,414	\$712,607	\$4,870,200	\$0	\$0	\$0

- All capital costs have been inflated using an escalation factor of 4 percent.
- The annual capital expenditures are financed either by withdrawals from the capital reserve funds, use of current rate revenue, or the issuance of long term bonds.
- All long-term debt is financed over twenty years at an interest rate of 5.75 percent. The repayment of the bonds is assumed to occur using constant annual principal payments.

Table 6
SEWER FUND CAPITAL PROGRAM

In FY2005 dollars	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11
CAPITAL PROGRAM							
Reserve: Martel Court	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000
Reserve: Sewer Infrastructure	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Reserve: Wastewater Treatment Plant	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Sewer Rehabilitation	375,685	50,000	125,000	220,000	241,198	150,000	817,172
WWTP Disinfection System		56,000		438,075			
Advanced Treatment		386,000		3,221,300			
Atomic Absorption Unit	37,000						37,000
Martel Court Demolition	111,000						
Channel Grinder Replacement						180,000	
Polymer Unit Replacement						160,000	
Railroad Property Support		193,541	54,968				
Sewer Main Improvements		1,309,905	1,217,428	1,037,186	1,055,004	1,427,005	1,000,000
Solids Dewatering Equipment		20,000	85,902	609,462			
Infrastructure Security			29,000	37,500			
Priority Cleaning Program		1,407,640					
New Manholes			125,000	125,000			
Manhole upgrades		50,000	50,000	50,000	50,000	50,000	
SUBTOTAL - APPROPRIATION	\$1,028,685	\$3,978,086	\$2,192,298	\$6,243,523	\$1,851,202	\$2,472,005	\$2,359,172
USE OF CAPITAL RESERVE	287,000	126,000	210,902	1,267,537	150,000	490,000	817,172
USE OF RATE REVENUE	\$741,685	\$555,000	\$709,000	\$717,500	\$646,198	\$555,000	\$542,000
BOND FUNDED	\$0	\$3,297,086	\$1,272,396	\$4,258,486	\$1,055,004	\$1,427,005	\$1,000,000

- The City has estimated incremental operating expenses based on the water and sewer capital programs. These incremental operating costs have been incorporated in the financial projections.
- Intergovernmental and miscellaneous revenues are assumed to remain constant over the timeframe of the analysis.

Section 3

Billing Summary & Structure

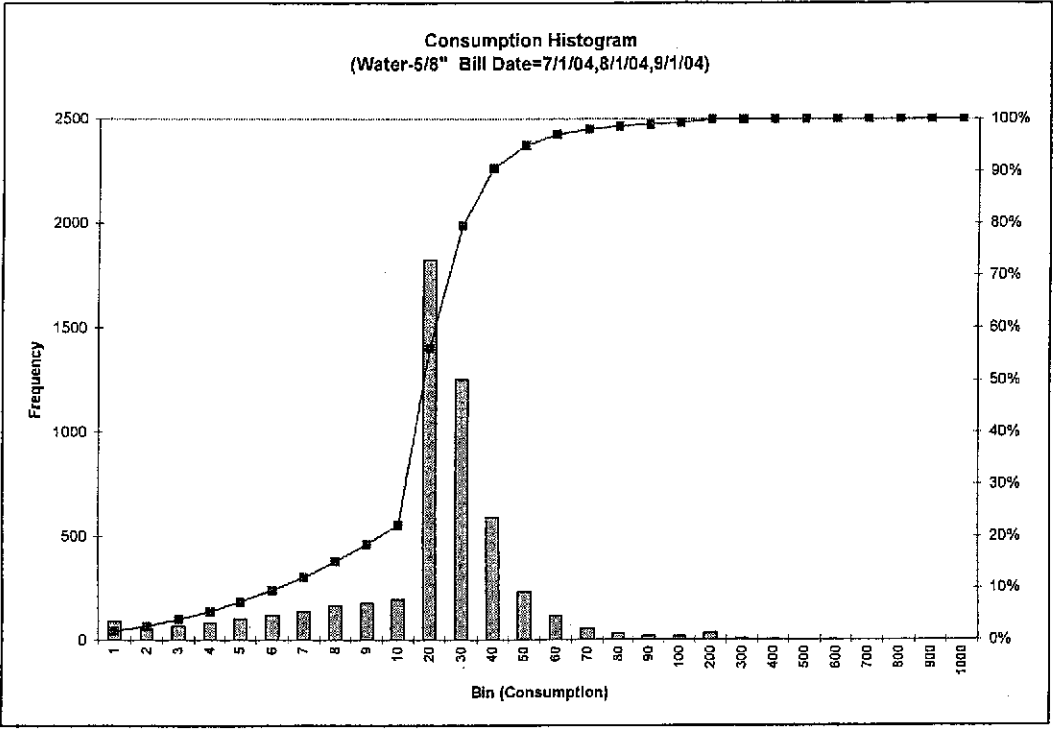
CDM has obtained detailed billing data for the last three fiscal years. This billing data provides the foundation of the design of detailed rate schedules described shown in Section 5. Table 7 shows water consumption for the last three fiscal years, the distribution of consumption among meter sizes and how water consumption falls with the three block segments, again varied by meter size. Overall, it can be observed that consumption falls relatively evenly across the three usage blocks.

Table 7
Consumption and Account Summary

	Accounts			Consumption (HCF)			Block Structure FY2004		
	FY2002	FY2003	FY2004	FY2002	FY2003	FY2004	First 20 HCF	20-200 HCF	>200 HCF
WATER 5/8"	4,567	4,896	5,251	477,201	470,954	488,656	310,812	131,766	46,078
WATER FLAT 5/8"	35	37	40	0	0	0	0	0	0
WATER 3/4"	19	20	23	5,481	6,037	5,505	1,367	3,455	683
WATER 1"	207	223	234	63,100	64,368	71,230	15,567	42,542	13,121
WATER 1 1/2"	63	71	78	31,449	30,913	34,735	5,510	19,563	9,662
WATER 2"	142	145	150	153,937	159,744	172,172	11,634	75,479	85,059
WATER 3"	17	17	18	67,678	74,098	69,233	1,380	10,874	56,979
WATER 4"	9	9	10	64,596	67,170	62,227	760	6,540	54,927
WATER 6"	0	1	1	0	10	6,100	80	720	5,300
SEASONAL WATER	26	44	48	3,154	4,022	3,670	713	2,439	518
TOTAL	5,085	5,463	5,853	866,596	877,316	913,528	347,823	293,378	272,327

We have used a consumption analysis in order to determine how the usage blocks could be structured. Figures 1 and 2 show consumption profiles during the summer and winter quarters for 5/8 inch (residential) water meters. Figures 3 and 4 show the same usage profiles for 2 inch (commercial) water meters.

Figure 1: 5/8 inch meter profile [Summer Quarter]



From these charts, it can be observed that residential usage is concentrated between 20 and 40 hcf per quarter. Commercial usage is most frequent around the 200 hcf mark. Hence, we have determined three blocks for rate design purposes: A first block capturing very small users with less than 20 hcf per quarter, a primarily residential block covering between 20 and 200 hcf per quarter, and a commercial and industrial block in excess of 200 hcf per quarter. These usage blocks will be reflected in the subsequent designs of the water and sewer rate schedules.

Figure 2: 5/8 inch meter profile [Winter Quarter]

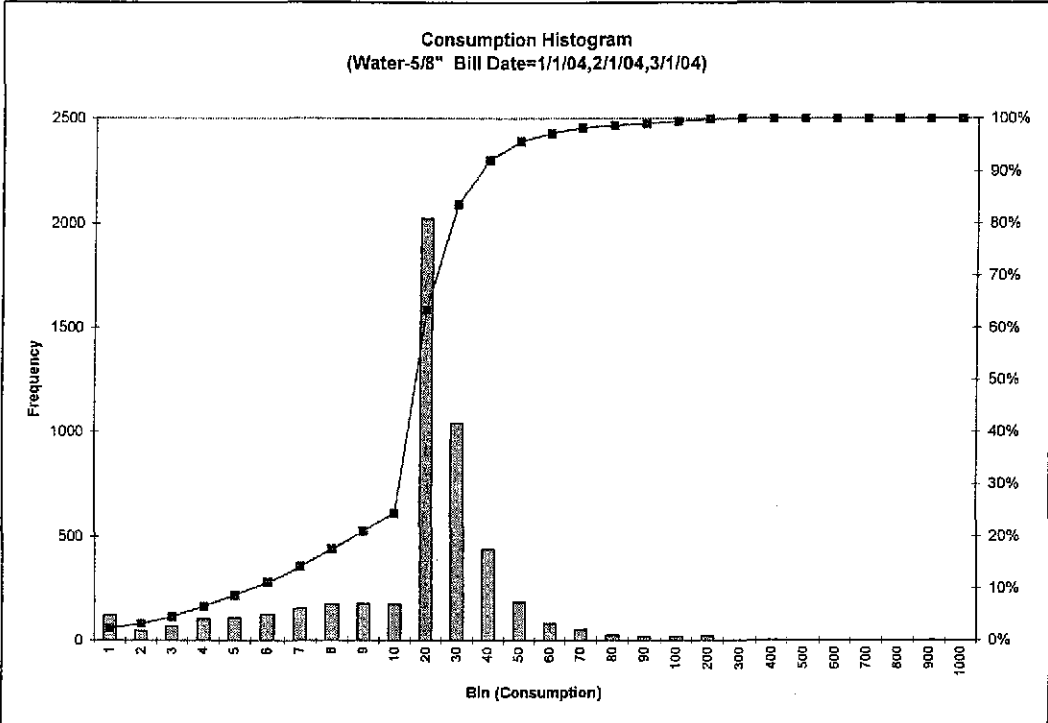


Figure 3: 2-inch meter profile [Summer Quarter]

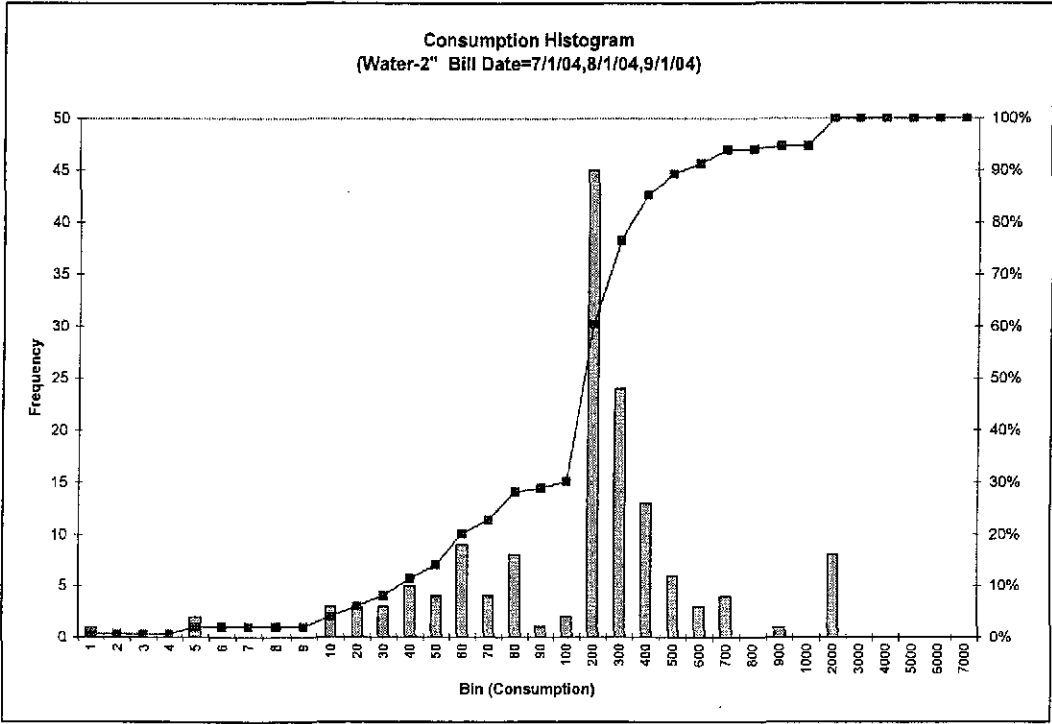
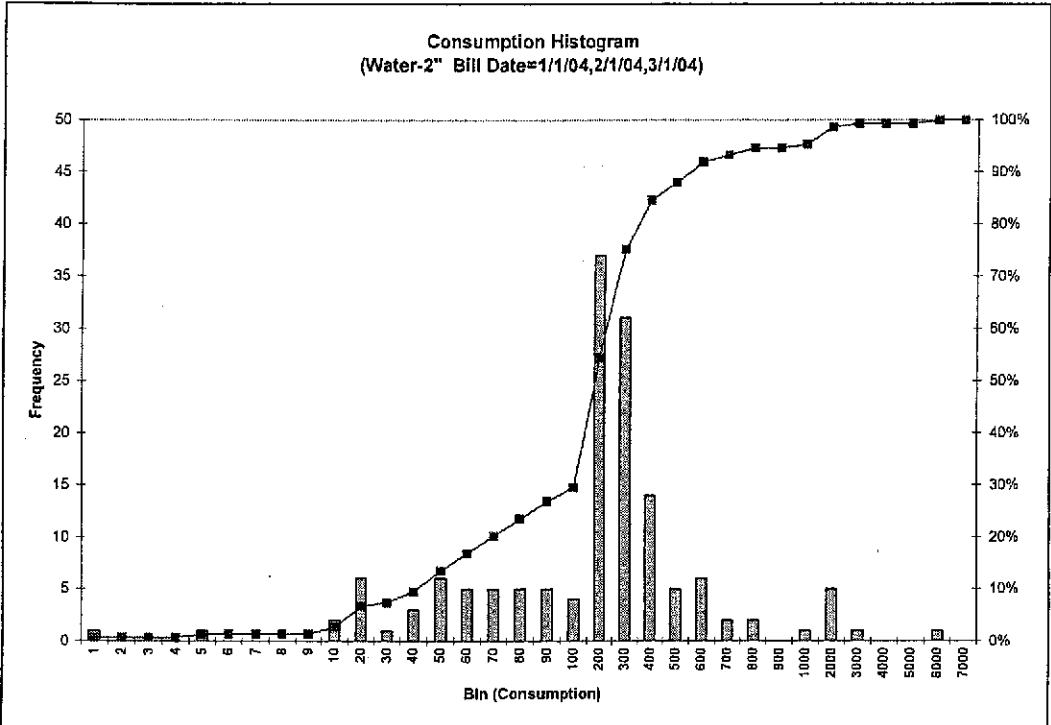


Figure 4: 2-inch meter profile [Winter Quarter]



Section 4

Revenue Requirements

Based on the financial information obtained from the City and the assumptions as documented in Section 2, we have projected the annual revenue requirements for the City's water and sewer utilities. Revenue requirements are estimated by adding operation and maintenance cost to the total capital cost of a utility. Any non-rate revenue sources are deducted in order to determine the total amount that needs to be raised from rate revenue on annual bases.

Water Expenses	2005	2006	2007	2008	2009	2010	2011
Public Works Water							
Administration	\$574,324	\$606,544	\$664,166	\$727,262	\$796,352	\$872,005	\$954,846
Water Min & Trench Repairs	\$121,499	\$137,733	\$150,818	\$165,145	\$180,834	\$198,013	\$216,824
Water Supply	\$208,709	\$163,190	\$178,693	\$195,669	\$214,257	\$234,612	\$256,900
Hydrants*	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Meters	\$232,100	\$259,721	\$284,394	\$311,412	\$340,996	\$373,391	\$408,863
Water Services	\$81,150	\$112,424	\$123,104	\$134,799	\$147,605	\$161,628	\$176,982
Water Treatment Facility	\$326,337	\$389,240	\$426,217	\$466,708	\$511,045	\$559,595	\$612,756
Laboratory	\$123,263	\$147,495	\$161,507	\$176,850	\$193,651	\$212,048	\$232,192
Maintenance	\$103,253	\$149,494	\$163,696	\$179,247	\$196,275	\$214,922	\$235,339
O&M Expenses	\$1,770,633	\$1,965,841	\$2,152,596	\$2,357,092	\$2,581,016	\$2,826,213	\$3,094,703
Debt Service – Existing**	\$757,608	\$707,674	\$707,736	\$740,452	\$807,610	\$799,214	\$780,386
Debt Service- Projected**	\$0	\$12,087	\$56,521	\$203,650	\$509,725	\$502,949	\$435,311
Current Revenue Financed	\$468,933	\$575,640	\$673,246	\$630,869	\$770,951	\$691,795	\$1,432,654
Total Capital	\$1,226,541	\$1,295,402	\$1,437,503	\$1,574,971	\$2,088,286	\$1,993,958	\$2,648,350
Revenues							
Taxes	\$170,999	\$165,809	\$160,619	\$155,428	\$150,237	\$145,047	\$139,857
Intergovernmental	\$46,000	\$46,000	\$46,000	\$46,000	\$46,000	\$46,000	\$46,000
Miscellaneous	\$66,100	\$66,100	\$66,100	\$66,100	\$66,100	\$66,100	\$66,100
Other Financing Sources	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other Revenues	\$283,099	\$277,909	\$272,719	\$267,528	\$262,337	\$257,147	\$251,957
Revenue Requirement	\$2,714,075	\$2,983,333	\$3,317,380	\$3,664,535	\$4,406,965	\$4,563,023	\$5,491,096
		9.9%	11.2%	10.5%	20.3%	3.5%	20.3%

* = 100% allocated to fire services.
** = Debt Service has been adjusted by allocation to fire service.

Table 8 shows the revenue requirements for the water utility over the timeframe of the analysis. The revenue requirements are net of the cost allocation to fire service

except for costs associated with public hydrants which are paid from the water revenue requirement. Between FY2005 and FY2011, the water revenue requirement is projected to increase from \$2.7 million to \$5.5 million. This equals an average annual increase of 12.5 percent.

Table 9 shows the revenue requirements for the sewer utility over the timeframe of the analysis. Between FY2005 and FY2011, the sewer revenue requirement is projected to increase from \$3.4 million to \$6.1 million. This equals an average annual increase of 10.5 percent.

Sewer Expenses	2005	2006	2007	2008	2009	2010	2011
Sewer Administration	\$335,726	\$441,743	\$483,708	\$529,661	\$579,978	\$635,076	\$695,409
Mains & Manholes	\$131,847	\$238,522	\$261,182	\$285,994	\$313,163	\$342,914	\$375,491
Services	\$38,855	\$31,373	\$34,353	\$37,617	\$41,191	\$45,104	\$49,389
Martel Court Pump Stn	\$129,076	\$116,408	\$127,467	\$139,576	\$152,836	\$167,355	\$183,254
Laboratory	\$156,275	\$160,502	\$175,750	\$192,446	\$210,729	\$230,748	\$252,669
Maintenance	\$305,236	\$129,100	\$141,365	\$154,794	\$169,500	\$185,602	\$203,234
WWTP	\$1,307,134	\$1,585,258	\$1,735,858	\$1,900,764	\$2,081,337	\$2,279,064	\$2,495,575
Incremental O&M*	\$0	\$0	-\$26,000	-\$28,470	\$191,062	\$209,213	\$229,089
O&M Expenses	\$2,404,149	\$2,702,906	\$2,959,682	\$3,240,852	\$3,548,733	\$3,885,863	\$4,255,020
Debt Service- Current	\$439,326	\$220,183	\$190,506	\$159,278	\$108,918	\$105,394	\$101,667
Debt Service- Projected	\$0	\$98,583	\$405,716	\$640,965	\$1,036,420	\$1,155,055	\$1,295,773
Current Revenue Financed	\$741,685	\$577,200	\$766,854	\$807,090	\$755,960	\$675,242	\$685,803
Total Capital	\$1,181,011	\$895,966	\$1,363,076	\$1,607,333	\$1,901,298	\$1,935,691	\$2,083,243
Revenues							
Taxes	\$62,305	\$60,414	\$58,522	\$56,631	\$54,740	\$52,849	\$50,958
Intergovernmental	\$59,991	\$59,991	\$59,991	\$59,991	\$59,991	\$59,991	\$59,991
Miscellaneous	\$56,050	\$56,050	\$56,050	\$56,050	\$56,050	\$56,050	\$56,050
Septage & HT Revenue	\$47,819	\$47,819	\$47,819	\$47,819	\$47,819	\$47,819	\$47,819
Total Revenues	\$226,165	\$224,274	\$222,382	\$220,491	\$218,600	\$216,709	\$214,818
Revenue Requirement	\$3,358,995	\$3,374,598	\$4,100,377	\$4,627,694	\$5,231,432	\$5,604,845	\$6,123,445
		0.5%	21.5%	12.9%	13.0%	7.1%	9.3%

* = Negative O&M expenses are based on estimated efficiency savings due to the new capital projects.

Section 5

Rate Structures

5.1 Rate Structure Alternatives

As part of the rate study analyses, CDM has provided the City's working group with an assessment of different rate structure alternatives, their motivations and respective impacts on different customer groups in the City's service area. As part of this process, we have analyzed the following alternatives:

- **Current rate schedule to provide a point of comparison.**

The current rate structure is set up with minimum charges dependent on meter size and a flat volume charge. The minimum charge includes a base quantity of water increasing with the size of the meter.

The minimum charge provides the utility with revenue certainty/stability independent of consumption. It is also frequently regarded as a capacity charge (consumers pay for the established connection to the system). However, since there is no block rate structure and the volume rate also is likely to be less than without minimum charges, the incentive for water consumption is likely muted.

- **Option I: Inclining block schedule**

This alternative assumes the creation of three usage blocks with incremental charges increasing as water consumption increases. (The more you use, the higher the charge.). The main motivation for such a rate schedule is to promote water conservation. The more water that is used, the higher the volume rate that is charged. Generally, the blocks are designed so that different customer classes (residential and commercial) end in different blocks. For example, it might be the case that residential customer rarely reach the highest block rate whereas commercial customers routinely fall into this category.

While this approach is designed to induce conservation, it also causes the utility's revenues to be more sensitive to changes in water consumption and thus problematic in years when demand is down because of heavy rainfall etc. The highest usage block is also charged the highest rate. Hence, a reduction in consumption falling into this block would also reduce revenues billed at the highest rate.

- **Option II: Inclining block schedule (Lifeline block)**

This alternative assumes an increasing block rate similar to the block structure in Option I. However, the billing rate for the first block is discounted to

provide so-called lifeline support to low users. The underlying premise is that small users are frequently on low or fixed incomes. The argument in favor of such a rate schedule would be the need to support elderly or low income households who may not be using a lot of water in general. If so, then the minimum amount of water consumption is charged at a low cost rate.

Nevertheless, since revenue requirements for the utility remain the same, the rates charged on consumption in higher blocks need to be increased in order to compensate for the lifeline block.

- **Option III: Senior Discount**

This option assumes the creation of a separate rate for senior customers. The rate will be a flat volume charge for qualified households. It is a more direct form of subsidy, but results in a higher administrative burden to confirm and track eligibility. In this case, a household would have to qualify to be charged the special rate. The process by which this is conducted usually includes a form of age or retirement status verification of the senior resident. For all other customers, the standard rate schedule is used, for example the rate schedule described as Option I above.

Again, any revenue lost by billing senior households at a lower rate will have to be compensated by all other user classes. In most cases, senior households do not take up a large share of the overall customer group and therefore the revenue impact is likely to be negligible.

- **Option IV: Fixed Billing Fee**

The utility can also decide that the cost incurred for billing purposes should be recovered from a separate fee. The reason behind this approach is that billing expenses are largely fixed and independent of the customer's consumption. Hence, a fixed fee per account can be developed that recovers these billing costs.

The advantage for the utility is the revenue continuity that the fixed fee creates. Regardless of metered consumption in a billing cycle, the revenue will be less variable because of the allocation of fixed cost into the billing charge. This option improves revenue stability at the expense of conservation intent. However, if the billing fee is substantial and the volume rate therefore relatively small, the impact on the willingness to conserve is likely to be small in the service area.

- **Option V: Fixed Fee varied by meter size (Debt Service)**

Another fixed cost component incurred by the utility is debt service. Capital improvements are in many cases financed over 20 years. Therefore, the utility

has to make the resulting debt service payments regardless of consumption or any other factor. This option assumes that all debt service is collected through a fixed fee per billing cycle.

Debt service costs are fixed and independent of water usage. It is therefore possible to vary the debt service based fee according to meter sizes. If the debt was incurred to increase or maintain the capacity of the system, then it is conceivable that larger users will take up more of the capacity put in place by the utility. An inclining block rate could then be used to recover all other costs.

Even with an inclining rate structure, it is again likely that the incentive to conserve water might be muted if a large share of the utility's cost is recovered by fixed fee revenue. This is in part dependent on the debt load of the utility. And the mix of capital and operating costs.

As an alternative, we have also estimated a flat volume charge in combination with the fixed fee based on debt service payments.

5.2 Regional Comparison

The City will have to decide if as part of this water and sewer rate study the structure of both or either rate schedule should be changed. We have surveyed ten communities in New Hampshire in order to determine how other utilities have structured their rate schedules. Table 10 below shows the result of CDM's survey.

The Public Utilities Commission in New Hampshire regulates the rate schedules of 33 water and 6 sewer utilities. CDM inquired about the type of rate schedules and was informed by the PUC that they are not aware of any block rate schedules within their jurisdiction. However, there are a number of unregulated utilities (Manchester Water Works and Concord that use block rates.)

Table 10
New Hampshire Comparison

NH Community	<u>Water Rate Schedules</u>			<u>Senior Discount?</u>	<u>Sewer Rate Schedules</u>		
	<u>Fixed Charge</u>	<u>Volume Charge</u>	<u>Average Bill FY 2001</u>		<u>Fixed Charge</u>	<u>Volume Charge</u>	<u>Senior Discount?</u>
Concord	Minimum charge	Declining block	\$264	No	Minimum charge	Flat volume rate	No
Derry	Minimum charge	Flat volume rate	\$247	No	Minimum charge	Flat volume rate	No
Hampton (Aquarion Water Company)	By meter size (consumption included)	Flat volume rate	\$453	No	Included in tax bill		
Hanover	Fixed charge by meter size	Flat volume rate	\$273	No	Fixed charge by meter size	Flat volume rate	No
Keene	Minimum charge	Flat volume charge	\$290	No	Minimum charge	Flat volume charge	No
Manchester	Fixed charge by meter size	Declining block	\$167	No	No	Flat volume rate	Yes
Nashua	Fixed charge by meter size	Flat volume rate	\$234	No	Minimum charge by meter size	Flat volume rate	No
North Conway	Minimum charge	Flat volume rate	\$260	No	Annual Fee	No	No
Pembroke	Yes (minimum charge)	Flat volume rate	\$129	No	Fixed charge by customer type	Flat volume rate	No
Portsmouth	Minimum charge by meter size	Flat volume rate		No	Minimum charge by meter size	Flat volume rate	No
Rochester	No	Flat volume rate	\$450	Yes	No	Flat volume rate	Yes

Note: Average Bills based on 2001 DES survey.

Across the board, it appears that most utilities use a fixed charge, either to recover capacity or billing costs. In most cases, consumption related costs are recovered through flat volume charges without the use of consumption blocks. In only two cases were senior discounts available for eligible customers.

5.3 Rate Structure Analysis

The City currently uses a water rate schedule that includes a minimum charge by meter size. The minimum charge includes a certain level of consumption varying again by meter size. The water and sewer rate schedules are shown in Tables 11 and 12, respectively. We have used FY2005 as the base year for discussion purposes.

In FY2005, the City's volume charge for its water customers is equal to \$2.00 per hcf. In order to recover all water utility related costs, this rate would have to be increased to \$3.29 per hcf in the same fiscal year.

Minimum consumption allowance based on meter size.	
WATER 5/8"	\$25.47
WATER 3/4"	\$25.47
WATER 1"	\$57.65
WATER 1 1/2"	\$136.72
WATER 2"	\$217.14
WATER 3"	\$542.86
WATER 4"	\$914.15
WATER 6"	\$1,906.04
Water Rate (\$ per HCF) - current	\$2.00
Water Rate (\$ per HCF) – full cost recovery	\$3.29

In order to assure full cost recovery for the sewer utility, the volume charge would need to be increased from \$2.59 to \$4.40 per hcf.

Minimum consumption allowance identical for all meter sizes.	
SEWER 5/8"	\$25.85
ELDERLY SEWER 5/8"	
SEWER 3/4"	\$25.85
SEWER 1"	\$25.85
SEWER 1 1/2"	\$25.85
SEWER 2"	\$25.85
SEWER 3"	\$25.85
SEWER 4"	\$25.85
SEWER 6"	\$25.85
SEWER FLAT RATE	\$25.85
Sewer Rate (Per Rate Schedule) - current	\$2.59
Sewer Rate (Per Rate Schedule) – full cost recovery	\$4.40

The charges for current public and private fire service are presented in Table 13.

Table 13
Current Fire Service Charges

Annual Fire Charges	
PRIVATE FIRELINE 1 1/2"	\$75.00
PRIVATE FIRELINE 2"	\$100.00
PRIVATE FIRELINE 4"	\$150.00
PRIVATE FIRELINE 6"	\$200.00
PRIVATE FIRELINE 8"	\$250.00
PRIVATE FIRELINE 10"	\$300.00
PUBLIC HYDRANT	\$180.00

The rate schedules for the different alternatives are presented in Table 14. In all cases have the rate structures been determined so that full cost recovery is assured.

Inclining Rate Schedule	<u>WATER</u>	<u>SEWER</u>
First 20 HCF	\$2.05	\$2.75
20-200HCF	\$3.08	\$4.13
>200 HCF	\$4.10	\$5.50
Inclining Rate Schedule (Lifeline Block)		
First 20 HCF	\$1.43	\$1.94
20-200HCF	\$3.58	\$4.85
>200 HCF	\$4.29	\$5.82
Senior Discount Rate		
Senior Rate (No block)	\$1.00	\$1.00
First 20 HCF	\$2.05	\$2.76
20-200HCF	\$3.08	\$4.14
>200 HCF	\$4.10	\$5.52
Fixed Fee rate (Billing)		
Fixed billing fee	\$22.90	\$7.64
First 20 HCF	\$1.65	\$2.61
20-200HCF	\$2.48	\$3.92
>200 HCF	\$3.30	\$5.22
Fixed Fee rate (Debt Service, varied by meter size)		
METER 5/8"	\$23.58	\$14.22
METER 3/4"	\$23.58	\$14.22
METER 1"	\$58.96	\$35.55
METER 1 1/2"	\$117.92	\$71.10
METER 2"	\$188.67	\$113.76
METER 3"	\$353.75	\$213.30
METER 4"	\$903.71	\$544.89
METER 6"	\$2,625.11	\$1,582.82
First 20 HCF	\$1.47	\$2.39
20-200HCF	\$2.21	\$3.59
>200 HCF	\$2.94	\$4.78
Alternatively: Flat volume rate	\$2.14	\$3.43
Fire Service Charges		
PRIVATE FIRELINE 1 1/2"	\$11.68	N/A
PRIVATE FIRELINE 2"	\$24.89	N/A
PRIVATE FIRELINE 4"	\$154.10	N/A
PRIVATE FIRELINE 6"	\$447.64	N/A
PRIVATE FIRELINE 8"	\$953.92	N/A
PRIVATE FIRELINE 10"	\$1,715.48	N/A
HYDRANTS	\$447.64	N/A

Charges for fire service have been determined by allocating the respective fire service costs from the overall water utility expenses including operating and capital costs. In FY2005, these fire-related costs were projected to be approximately \$450,000 or 16% of the total revenue requirement which is consistent with and based on AWWA guidelines. The fire service charges have then been calculated by using the equivalency ratios suggested by AWWA.

Table 15 shows water rate projections using the current schedule used by the City. Water consumption is assumed to remain unchanged over the timeframe of the analysis. Hence, the resulting water rates are the direct result of the changes in the water revenue requirements. For simplicity, we have assumed that the meter-based charges remain fixed.

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>
CURRENT							
WATER 5/8"	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47
WATER 3/4"	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47
WATER 1"	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65
WATER 1 1/2"	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72
WATER 2"	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14
WATER 3"	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86
WATER 4"	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15
WATER 6"	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04
Volume Rate (\$ per hcf)	\$3.29	\$2.20	\$4.33	\$4.84	\$5.51	\$5.82	\$6.55

Table 16 shows the alternative rate schedules and the projected rates and charges from FY2005 until FY2011. Again, consumption is assumed fixed and the changes in the water rates are directly caused by the changes in the underlying financial needs.

Table 16 Water Rate Projections							
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
CURRENT							
WATER 5/8"	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47
WATER 3/4"	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47	\$25.47
WATER 1"	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65	\$57.65
WATER 1 1/2"	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72	\$136.72
WATER 2"	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14	\$217.14
WATER 3"	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86	\$542.86
WATER 4"	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15	\$914.15
WATER 6"	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04	\$1,906.04
Volume Rate (\$ per hcf)	\$3.29	\$2.20	\$4.34	\$4.86	\$5.53	\$5.85	\$6.58
Inclining Rate Schedule							
First 20 HCF	\$2.05	\$2.25	\$2.50	\$2.76	\$3.31	\$3.43	\$4.13
20-200HCF	\$3.08	\$3.38	\$3.75	\$4.14	\$4.97	\$5.15	\$6.20
>200 HCF	\$4.10	\$4.50	\$5.00	\$5.52	\$6.62	\$6.86	\$8.26
Inclining Rate Schedule (Lifeline Block)							
First 20 HCF	\$1.43	\$1.58	\$1.75	\$1.94	\$2.33	\$2.41	\$2.90
20-200HCF	\$3.58	\$3.95	\$4.38	\$4.85	\$5.83	\$6.03	\$7.25
>200 HCF	\$4.29	\$4.74	\$5.25	\$5.82	\$6.99	\$7.23	\$8.70
Senior Discount Rate							
Senior Rate (No block)	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
First 20 HCF	\$2.05	\$2.25	\$2.50	\$2.76	\$3.32	\$3.44	\$4.14
20-200HCF	\$3.08	\$3.38	\$3.75	\$4.14	\$4.98	\$5.16	\$6.21
>200 HCF	\$4.10	\$4.50	\$5.00	\$5.52	\$6.64	\$6.88	\$8.28
Fixed Fee rate (Billing)							
Fixed billing fee	\$22.90	\$24.83	\$26.65	\$28.61	\$30.72	\$32.97	\$35.40
First 20 HCF	\$1.65	\$1.82	\$2.03	\$2.25	\$2.76	\$2.84	\$3.47
20-200HCF	\$2.48	\$2.73	\$3.05	\$3.38	\$4.14	\$4.26	\$5.21
>200 HCF	\$3.30	\$3.64	\$4.06	\$4.50	\$5.52	\$5.68	\$6.94
Fixed Fee rate (Debt Service)							
Fixed billing fee	\$33.41	\$33.41	\$33.41	\$33.41	\$33.41	\$33.41	\$33.41
First 20 HCF	\$1.47	\$1.68	\$1.92	\$2.05	\$2.32	\$2.45	\$3.15
20-200HCF	\$2.21	\$2.52	\$2.88	\$3.08	\$3.48	\$3.68	\$4.73
>200 HCF	\$2.94	\$3.36	\$3.84	\$4.10	\$4.64	\$4.90	\$6.30
Alternative: Flat volume rate	\$2.14	\$1.45	\$2.80	\$3.13	\$3.55	\$3.75	\$4.20

Table 16 (Continued)
Water Rate Projections

Fixed Fees based on Debt Service							
WATER 5/8"	\$25.47	\$22.06	\$22.06	\$22.06	\$22.06	\$22.06	\$22.06
WATER 3/4"	\$25.47	\$31.77	\$31.77	\$31.77	\$31.77	\$31.77	\$31.77
WATER 1"	\$57.65	\$56.48	\$56.48	\$56.48	\$56.48	\$56.48	\$56.48
WATER 1 1/2"	\$136.72	\$127.08	\$127.08	\$127.08	\$127.08	\$127.08	\$127.08
WATER 2"	\$217.14	\$225.92	\$225.92	\$225.92	\$225.92	\$225.92	\$225.92
WATER 3"	\$542.86	\$508.31	\$508.31	\$508.31	\$508.31	\$508.31	\$508.31
WATER 4"	\$914.15	\$903.67	\$903.67	\$903.67	\$903.67	\$903.67	\$903.67
WATER 6"	\$1,906.04	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25	\$2,033.25

Table 17 shows sewer rate projections over the analysis timeframe for both the current rate schedule and all alternative scenarios. In all cases is 100 percent cost recovery assumed.

Table 17 Sewer Rate Projections							
	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
CURRENT							
Meter Charge	\$25.85	\$25.85	\$25.85	\$25.85	\$25.85	\$25.85	\$25.85
Volume Charge (\$ per hcf)	\$4.40	\$4.55	\$5.17	\$6.39	\$7.66	\$7.80	\$8.18
Inclining Rate Schedule							
First 20 HCF	\$2.75	\$2.76	\$3.36	\$3.79	\$4.28	\$4.59	\$5.01
20-200HCF	\$4.13	\$4.14	\$5.04	\$5.69	\$6.42	\$6.89	\$7.52
>200 HCF	\$5.50	\$5.52	\$6.72	\$7.58	\$8.56	\$9.18	\$10.02
Inclining Rate Schedule (Lifeline Block)							
First 20 HCF	\$1.94	\$1.95	\$2.37	\$2.67	\$3.02	\$3.23	\$3.53
20-200HCF	\$4.85	\$4.88	\$5.93	\$6.68	\$7.55	\$8.08	\$8.83
>200 HCF	\$5.82	\$5.85	\$7.11	\$8.01	\$9.06	\$9.69	\$10.59
Senior Discount Rate							
Senior Rate (No block)	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
First 20 HCF	\$2.76	\$2.77	\$3.37	\$3.80	\$4.30	\$4.60	\$5.03
20-200HCF	\$4.14	\$4.16	\$5.06	\$5.70	\$6.45	\$6.90	\$7.55
>200 HCF	\$5.52	\$5.54	\$6.74	\$7.60	\$8.60	\$9.20	\$10.06
Fixed Fee rate (Billing)							
Fixed billing fee	\$7.64	\$10.05	\$10.79	\$11.58	\$12.43	\$13.35	\$14.33
First 20 HCF	\$2.61	\$2.61	\$3.16	\$3.57	\$4.04	\$4.33	\$4.73
20-200HCF	\$3.92	\$3.92	\$4.74	\$5.36	\$6.06	\$6.50	\$7.10
>200 HCF	\$5.22	\$5.22	\$6.32	\$7.14	\$8.08	\$8.66	\$9.46
Fixed Fee rate (Debt Service)							
Fixed billing fee	\$19.99	\$19.99	\$27.13	\$36.42	\$52.12	\$57.36	\$63.60
First 20 HCF	\$2.39	\$2.41	\$2.88	\$3.13	\$3.35	\$3.56	\$3.87
20-200HCF	\$3.59	\$3.62	\$4.32	\$4.70	\$5.03	\$5.34	\$5.81
>200 HCF	\$4.78	\$4.82	\$5.76	\$6.26	\$6.70	\$7.12	\$7.74
Alternative: Flat volume rate	\$3.43	\$3.54	\$3.82	\$4.49	\$5.04	\$5.01	\$5.13
SEWER 5/8"							
SEWER 5/8"	\$25.85	\$13.31	\$18.06	\$24.24	\$34.69	\$38.18	\$42.33
SEWER 3/4"							
SEWER 3/4"	\$25.85	\$19.16	\$26.00	\$34.90	\$49.96	\$54.98	\$60.95
SEWER 1"							
SEWER 1"	\$25.85	\$34.07	\$46.23	\$62.05	\$88.81	\$97.74	\$108.36
SEWER 1 1/2"							
SEWER 1 1/2"	\$25.85	\$76.65	\$104.02	\$139.61	\$199.82	\$219.90	\$243.80
SEWER 2"							
SEWER 2"	\$25.85	\$136.26	\$184.92	\$248.20	\$355.24	\$390.94	\$433.43
SEWER 3"							
SEWER 3"	\$25.85	\$306.59	\$416.08	\$558.46	\$799.28	\$879.62	\$975.22
SEWER 4"							
SEWER 4"	\$25.85	\$545.04	\$739.70	\$992.81	\$1,420.95	\$1,563.76	\$1,733.72
SEWER 6"							
SEWER 6"	\$25.85	\$1,226.35	\$1,664.32	\$2,233.83	\$3,197.14	\$3,518.46	\$3,900.86

5.4 Fire Service

Based on the water utility's revenue requirement, the relevant cost applicable to fire service have been broken out. In FY2005, the total fire related costs amount to approximately \$450,000. The total fire related costs consist of allocated operating and capital costs. Overall, these amount to 16% of the total revenue requirement of the water utility. The share of the total costs is consistent with analyses presented by AWWA in its M-1 rate manual based on the number of customers for a utility. Using the total costs, the private and public fire service charges have been estimated using AWWA equivalent units. The inventory and equivalent unit calculations are shown in Table 18. Based on the AWWA methodology, a hydrant has been set equal to a 6 inch private fireline.

	<u>Size</u>	<u>Inventory</u>	<u>AWWA Equivalency.</u>	<u>Total Equivalent Units</u>
PRIVATE FIRELINE 1 1/2"	1.50	1	5.76	6
PRIVATE FIRELINE 2"	2.00	14	10.24	143
PRIVATE FIRELINE 4"	4.00	34	40.96	1,393
PRIVATE FIRELINE 6"	6.00	116	92.16	10,691
PRIVATE FIRELINE 8"	8.00	33	163.84	5,407
PRIVATE FIRELINE 10"	10.00	1	256.00	256
HYDRANTS		959	92.16	88,381
Total				106,276

Note: Public hydrants total 750 city-wide. These hydrants are not paid directly by the City but the costs are included in the water revenue requirement.

Using the identical methodology going forward, the fire charges have also been projected over the entire timeframe of the analysis. Table 19 contains this information.

Annual Fire Charges	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
PRIVATE FIRELINE 1 1/2"	\$24.37	\$24.96	\$27.44	\$29.88	\$37.79	\$37.79	\$46.95
PRIVATE FIRELINE 2"	\$43.33	\$44.38	\$48.79	\$53.12	\$67.18	\$67.18	\$83.47
PRIVATE FIRELINE 4"	\$173.33	\$177.51	\$195.14	\$212.50	\$268.73	\$268.73	\$333.89
PRIVATE FIRELINE 6"	\$389.99	\$399.39	\$439.07	\$478.12	\$604.64	\$604.64	\$751.24
PRIVATE FIRELINE 8"	\$693.31	\$710.03	\$780.57	\$849.99	\$1,074.92	\$1,074.92	\$1,335.54
PRIVATE FIRELINE 10"	\$1,083.30	\$1,109.42	\$1,219.63	\$1,328.11	\$1,679.56	\$1,679.56	\$2,086.78
HYDRANTS	\$389.99	\$399.39	\$439.07	\$478.12	\$604.64	\$604.64	\$751.24

There are approximately 750 public hydrants within the City's service area. Cost allocated to those hydrants is not allocated from direct charges but is included in the overall water revenue requirement.

5.5 Other Charges

The City has codified other rates and charges in its ordinances. Among those charges are surcharges for high strength pollutants in wastewater. In addition to these surcharges, the City has created letting-on/letting-off charges, new and repaired service charges, and flat rate charges based on fixtures in a residence with a water meter. CDM has reviewed the City ordinance and has concluded that these charges are reasonable and consistent with the overall billing practices followed by the City's water and sewer utilities. However, utilities across the country have implemented numerous other billing and service charges. The following is a list of some of these miscellaneous charges:

- Connection Fee
- Buy-in Fee
- Set up fee for new accounts
- Account application charge
- Installation fee for meter install
- Bad check fee
- Delinquency notice charge
- Duplicate bill charge
- Duplicate delinquency notice charge
- Late payment fee
- Reconnection fee
- Freezing charge (varied by meter size)
- Hydrant test fee (request of customer)
- Unauthorized hydrant use fee
- Testing and replacement of meter fee
- Meter read fee
- Calibration Fee
- Second trip fee
- Account research after hours account turn on/off
- Lock-off meter fee for unauthorized use/non-payment
- Field research request fee (customer request)
- Fire flow test request fee
- Force main pressure test fee
- Meter tampering charge

At the City's discretion other charges could be implemented but they should be reviewed in light of their respective impact on water and sewer customers.

Furthermore, the City charges for the disposal of septage at the wastewater treatment plant. The septage and holding tank volumes are charged at rates of \$75 per 1,000 gallons and \$25 per 1,000 gallons, respectively. On average, 460,000 gallons of septage

and 534,000 gallons of holding tank volumes have been disposed at the receiving facility over the last twelve years. Table 20 shows this information. The average annual revenue collected totaling roughly \$48,000 from both sources has been included in the sewer revenue requirement projections.

	Septage Total (gallons)	Holding Tank Total (Gallons)
1993	828,400	588,600
1994	902,900	683,100
1995	158,300	451,700
1996	171,700	504,400
1997	94,600	276,324
1998	110,300	361,200
1999	266,000	366,300
2000	209,200	370,300
2001	196,750	772,650
2002	237,400	897,000
2003	959,650	555,710
2004	1,378,700	584,000
Average Volume	459,492	534,274
Average Revenue	\$34,462	\$13,357

The City commissioned a separate feasibility study on improvements to the septage receiving facility. The final draft of the study, dated February 11 2005, compared the fees charged at the City's facility to fees charged at alternative disposal facilities in the local area. Based on the benchmarking analysis presented in the study, the City's fees are seen as being cost competitive.

Section 6

Customer Impacts

In addition to rate structure alternatives, we have also estimated the impact on annual average household bill that each rate schedule will generate. For this purposes, we are considering 5 average households with water use of between 20 and 200 HCF per year. The resulting annual household bills are presented in Tables 21 and 22.

These household bill impacts have been estimated using the FY2005 revenue requirement and resulting rates for each scenario. However, considering all rate schedules except the one currently used by the City assume full cost recovery, household bills are expected to increase.

Depending on the chosen rate structure, customers with different levels of consumption will be affected differently. For example, an inclining block rate structure might benefit the small users because those no longer need to pay a quarterly minimum amount and water consumption is billed at a relatively low rate. However, larger users will incur higher charges because their consumption will fall into the more expensive usage blocks.

**Table 21
Water Average Household Bills, FY2005**

Average Household Annual Water Use (HCF)	Current		Revised Current		Inclining Rate Schedule		Inclining Rate Schedule (Lifeline)		Senior Discount Rate (Non-Senior)		Senior Discount Rate (Senior)		Fixed Fee rate (Billing)		Fixed Fee rate (Debt Service)		Fixed Fee (Debt Service - Constant Volume)	
	Current	Bill	Current	Bill	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%
20	\$101.88	\$101.88	0.0%	\$41.00	\$28.60	-71.9%	\$41.00	-59.8%	\$20.00	-80.4%	\$124.60	22.3%	\$117.65	15.5%	\$131.08	28.7%	\$195.33	60.3%
50	\$121.88	\$134.83	10.6%	\$133.25	\$135.85	11.5%	\$133.25	9.3%	\$60.00	-59.0%	\$198.85	63.2%	\$183.80	50.8%	\$302.41	36.3%	\$409.50	27.2%
100	\$221.88	\$299.57	35.0%	\$328.00	\$343.20	54.7%	\$328.00	47.8%	\$100.00	-54.9%	\$355.60	60.3%	\$323.45	45.8%	\$409.50	27.2%	\$516.58	22.4%
150	\$321.88	\$464.30	44.2%	\$533.00	\$557.70	73.3%	\$533.00	65.6%	\$150.00	-53.4%	\$520.60	61.7%	\$470.45	46.2%	\$409.50	27.2%	\$516.58	22.4%
200	\$421.88	\$629.04	49.1%	\$738.00	\$772.20	83.0%	\$738.00	74.9%	\$200.00	-52.6%	\$685.60	62.5%	\$617.45	46.4%	\$516.58	22.4%	\$516.58	22.4%

**Table 22
Sewer Average Household Bills, FY2005**

Average Household Annual Water Use (HCF)	Current		Revised Current		Inclining Rate Schedule		Inclining Rate Schedule (Lifeline)		Senior Discount Rate (Non-Senior)		Senior Discount Rate (Senior)		Fixed Fee rate (Billing)		Fixed Fee rate (Debt Service)		Fixed Fee (Debt Service - Constant Volume)	
	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%
20	\$103.40	0.0%	\$55.00	-46.8%	\$38.80	-62.5%	\$55.20	-46.6%	\$20.00	-80.7%	\$82.76	-20.0%	\$101.03	-2.3%	\$121.74	17.7%		
50	\$129.30	14.0%	\$178.75	38.2%	\$184.30	42.5%	\$179.40	38.7%	\$50.00	-61.3%	\$200.21	54.8%	\$208.58	61.3%	\$224.50	73.6%		
100	\$258.80	41.9%	\$440.00	70.0%	\$465.60	79.9%	\$441.60	70.6%	\$100.00	-61.4%	\$448.16	73.2%	\$435.63	68.3%	\$395.77	52.9%		
150	\$388.30	51.2%	\$715.00	84.1%	\$756.60	94.8%	\$717.60	84.8%	\$150.00	-61.4%	\$709.16	82.6%	\$674.63	73.7%	\$567.04	46.0%		
200	\$517.80	55.9%	\$990.00	91.2%	\$1,047.60	102.3%	\$993.60	91.9%	\$200.00	-61.4%	\$970.16	87.4%	\$913.63	76.4%	\$738.31	42.6%		

The preceding analysis provides insights to how the various rate alternatives will impact various residential customer types. Table 23 and 24 also show the relative impacts on a set of larger customers.

The rate study working group has based on discussions with CDM narrowed the rate structure alternatives. The next stage of the study is for the City to assess which of the policy options best meet the City's objectives and choose one rate structure alternative.

Table 24
Sewer Bill Comparison - Large Accounts

Meter Size	Annual (HCE)	Current Rate Schedule		Current Schedule Revised		Inclining Rate Schedule		Inclining Rate Schedule (lifetime Block)		Senior Discount Rate		Fixed fee (Billing)		Fixed Fee (Debt Service)		Fixed Fee (Debt Service - Constant Volume)		
		Rate Schedule	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%	Bill	%
WATER 1"	5344	\$13,841	\$23,429	69%	\$28,182	104%	\$30,093	117%	\$28,284	104%	\$26,778	93%	\$24,629	78%	\$18,442	33%	\$18,442	33%
WATER 1"	4692	\$12,152	\$20,562	69%	\$24,596	102%	\$26,299	116%	\$24,685	103%	\$23,374	92%	\$21,512	77%	\$16,208	33%	\$16,208	33%
WATER 1 1/2"	8040	\$20,823	\$35,286	69%	\$43,010	107%	\$45,784	120%	\$43,166	107%	\$40,851	96%	\$37,686	81%	\$27,847	34%	\$27,847	34%
WATER 1 1/2"	3320	\$8,599	\$14,528	69%	\$17,050	98%	\$18,314	113%	\$17,112	99%	\$16,213	89%	\$15,125	76%	\$11,679	36%	\$11,679	36%
WATER 2"	21160	\$54,804	\$92,985	70%	\$115,170	110%	\$122,142	123%	\$115,589	111%	\$109,337	100%	\$100,638	84%	\$73,027	33%	\$73,027	33%
WATER 2"	8172	\$21,165	\$35,866	69%	\$43,736	107%	\$46,552	120%	\$43,895	107%	\$41,540	96%	\$38,556	82%	\$28,538	35%	\$28,538	35%
WATER 3"	43588	\$112,893	\$191,619	70%	\$238,524	111%	\$252,673	124%	\$239,391	112%	\$226,412	101%	\$208,525	85%	\$150,534	33%	\$150,534	33%
WATER 3"	7320	\$18,959	\$32,119	69%	\$39,050	106%	\$41,594	119%	\$39,192	107%	\$37,093	96%	\$35,164	85%	\$26,301	39%	\$26,301	39%
WATER 4"	30360	\$78,632	\$133,445	70%	\$165,770	111%	\$175,686	123%	\$166,373	112%	\$157,361	100%	\$146,249	86%	\$106,176	35%	\$106,176	35%
WATER 4"	11776	\$30,500	\$51,716	70%	\$63,558	108%	\$67,528	121%	\$63,789	109%	\$60,353	98%	\$57,418	88%	\$42,518	39%	\$42,518	39%
WATER 6"	12220	\$31,650	\$53,669	70%	\$66,000	109%	\$70,112	122%	\$66,240	109%	\$62,671	98%	\$62,265	97%	\$46,764	48%	\$46,764	48%

Worksheet D

Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income}} \times 100$$

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or Worksheet C, Option A (10)]

\$ 453.13 (1)

Median Household Income *

\$ 49,656 (2)

Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100)

0.91 % (3)

B. Evaluation of The Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact	Mid-Range Impact	Large Impact
Less than 1.0%	1.0% - 2.0%	Greater than 2.0%
Indication of no substantial economic impacts))))))))))))) Proceed to Secondary Test	

2050

1990 Census adjusted by CPI inflation rate if necessary. — adjusted to 2010

For wkst-D

preliminary screener

median household income from census: calculated	Year	CPI	CPI change	
\$37,033	2000	179.4		
\$38,065	2001	184.4	1.028	estimated
\$38,850	2002	188.2	1.021	estimated
\$39,944	2003	193.5	1.028	estimated
\$41,327	2004	200.2	1.035	estimated
\$42,834	2005	207.5	1.036	estimated
\$44,119	2006		1.030	estimated
\$45,442	2007		1.030	estimated
\$46,805	2008		1.030	estimated
\$48,210	2009		1.030	estimated
\$49,656	2010		1.030	estimated

At 3% cpi threshold 1.5-2% 2009 \$723.14 2% MHI \$964.19
 At 3% cpi threshold 1.5-2% 2010 \$744.84 2% MHI \$993.12

Per Alex, the annual 5/8 inch bill is around 30 hcf/quarter
 estimate annual sewer bill 5/8 inch m: \$/hcf

Year	5/8 inch m: \$/hcf	1 year meter	120 hcf	year total
2007	\$13.31	\$4.14	\$496.80	\$550.04
2008	\$16.40	\$4.60	\$552.00	\$617.60
2009	\$27.06	\$5.53	\$663.60	\$771.84
2010	\$53.84	\$5.10	\$612.00	\$827.36

These numbers are from sewer model spreadsheet

Between 1.5 and 2%, continue analysis @3% CPI

Actual % =
 2009 1.60
 2010 1.67

For wkst-D

preliminary screener

median household income from census: calculated	Year	CPI	CPI change	
\$37,033	2000	179.4		
\$38,065	2001	184.4	1.028	estimated
\$38,850	2002	188.2	1.021	estimated
\$39,944	2003	193.5	1.028	estimated
\$41,327	2004	200.2	1.035	estimated
\$42,834	2005	207.5	1.036	estimated
\$44,119	2006		1.030	estimated
\$45,442	2007		1.030	estimated
\$46,805	2008		1.030	estimated
\$48,210	2009		1.030	estimated
\$49,656	2010		1.030	estimated

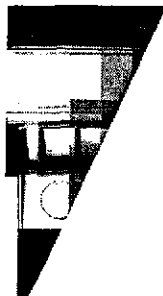
At 3% cpi threshold 1.5-2% 2009 \$723.14 1.5% MHI 2% MHI
 At 3% cpi threshold 1.5-2% 2010 \$744.84 \$993.12

Per Alex, the annual 5/8 inch bill is around 30 hcf/quarter
 estimate annual sewer bill 5/8 inch m \$/hcf 1 year meter 120 hcf year total
 2007 \$13.31 \$4.14 \$53.24 \$496.80 \$550.04
 2008 \$16.40 \$4.60 \$65.60 \$552.00 \$617.60
 2009 \$27.06 \$5.53 \$108.24 \$663.60 \$771.84
 2010 \$53.84 \$5.10 \$215.36 \$612.00 \$827.36

Between 1.5 and 2%, continue analysis @3% CPI

Actual % =
 2009 1.60
 2010 1.67

These numbers are from sewer model spreadsheet





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Change Output
Options:

From: 1996 To: 2006 **GO**

Include graphs **NEW!**

[More Formatting Options](#) →

Data extracted on: July 10, 2006 (4:24:21 PM)

Consumer Price Index - All Urban Consumers

Series Id: CUUR0100SA0
 Not Seasonally Adjusted
 Area: Nonseasonal Urban
 Item: All items
 Base Period: 1982-84=100

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	HA
1996	161.4	162.2	162.8	162.9	163.0	163.1	163.4	164.0	164.6	165.1	165.4	165.7	163.6	163.6
1997	166.2	166.9	167.3	167.1	166.8	167.0	167.6	167.8	168.4	168.7	168.5	168.4	167.6	167.6
1998	168.8	169.1	169.3	169.5	169.4	169.6	169.9	170.5	170.6	171.3	171.2	171.2	170.0	170.0
1999	171.4	171.6	171.9	172.8	172.8	173.1	173.4	174.1	174.8	175.5	175.5	175.5	173.5	173.5
2000	176.2	177.6	178.5	178.5	178.4	179.0	179.8	179.9	180.7	181.2	181.5	181.3	179.4	179.4
2001	182.2	182.8	183.7	184.2	184.6	185.3	185.0	185.1	185.1	185.0	185.0	184.2	184.4	184.4
2002	184.9	186.1	187.0	187.8	187.7	187.8	188.3	189.3	189.5	189.9	190.1	189.6	188.2	188.2
2003	190.5	191.7	193.0	192.6	192.7	192.8	193.5	194.3	195.0	195.4	195.1	194.9	193.5	193.5
2004	195.9	196.8	198.6	199.4	199.9	201.1	201.0	201.0	201.2	202.5	202.6	201.9	200.2	200.2
2005	202.6	203.6	206.0	206.9	206.2	206.2	207.9	208.7	210.8	211.5	210.0	209.0	207.5	207.5
2006	211.0	211.6	212.8	214.7	215.7	216.7								

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