

LETTER REPORT
ON
PROPOSED REVISIONS
TO SEWER RATES
ADOPTED
JUNE 26, 2006
BY
TOWN OF CHARLTON, MASSACUSETTS
BOARD OF WATER & SEWER COMMISSIONERS

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ALCOTT ASSOCIATES

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January 4, 2008
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Board of Water & Sewer Commissioners
Town of Charlton
7 Worcester Road
Charlton, MA 01507

Subject: Review of Sewer Rates Adopted June 2006

Dear Board Members:

On December 17, 2007 we presented a review of the rates adopted in June 2006. When the Board adopted the new rates in June 2006, it was clear that the data supporting the 2006 metered rates were mostly estimated data. As users converted to meters it was anticipated that actual metered data would become available and the adopted rates would be reviewed. Unfortunately, the amount of actual metered data available at this time is less than anticipated. However, the data generally supports the assumptions used for the June 2006 metered rates.

The review presented on December 17 included (1) an update of the cost basis for the rates from Fiscal Year 2007 to Fiscal Year 2008, (2) an analysis of the users who are now billed on the new metered rate instead of the Title V rate and (3) as per the Board's request, an analysis of the impact of changing the capacity charge/volumetric charge from 65% capacity/35% volumetric, to a 50%/50% split. At the December 17 meeting, the Board requested additional alternative "scenarios" be analyzed, namely a 40%/60% split and a 30%/70% split. These additional analyses were submitted to the Sewer Department on December 18.

The purpose of this letter report is to discuss issues raised about the metered rates adopted in June 2006, to summarize the review analyses conducted to date and to provide our conclusions regarding the possible changes to the sewer rates.

General Discussion

Point No. 1: There is limited discretion when setting municipal sewer rates. By law an enterprise fund budget must be balanced. A “normal” business may choose to take a loss on some of its goods or services. Except for non-cost but otherwise appropriate ratemaking objectives, such as pricing discounts for low-income users, a municipal enterprise should price its service reasonably close to the cost of service.

Point No. 2: When rate structure changes are made and decreases in revenue from a particular user or group of users occur, such as in Charlton’s case when a user converts to the metered rate and experiences a savings from the Title V billing, then the decrease must be made up from other revenue sources in order to balance the budget. This shift can be seen on the bill comparison tables submitted with the December 17 review package and the alternative scenarios. The tables are labeled “Schedule 5” and “Schedule 6” and show increases and decreases for residential and other users respectively. But the overall rates have been designed to match the total revenue required.

Point No. 3: At the time of developing the rates adopted in June 2006, an objective of the metered rate design was to maintain consistency with the Title V bedroom unit, or bedroom equivalent unit, basis. This was accomplished by adopting a per dwelling unit capacity charge, which was relatively high. The consistency for an average residential user billed under either of the two rates can be shown as follow:

TITLE V BILL: Total charge: using an “average” of 2.5 bedrooms x \$70 = **\$175 per quarter**

METERED RATE BILL:

Assuming an average use of 18,000 gallons/qtr x \$0.0046 per gallon	\$82.80
Plus the capacity charge per Equivalent Dwelling Unit (“EDU”)	<u>\$93.75</u>
Total charge:	\$176.55 per quarter

Point No. 4: It was recognized that the high capacity charge would impact any user whose actual metered usage was significantly less than the assigned capacity. This condition is often referred to as having a poor “load factor”. The utility has dedicated plant and equipment and is incurring significant costs in order to be ready to provide service at the rated “capacity”. In electric service a customer with a poor “load factor” may be billed a high demand charge based on the kilowatt (KW) demand as determined by the utility. In addition to the KW demand charge, electric customers pay a kilowatt-hour (or KWH) charge for the amount of electricity actually used.

When a particular user’s actual use is significantly less than the assigned capacity it creates a relatively “poor” load factor and the total bill on a per unit of use basis can be very different from a user who has a “better” load factor, as shown in the following example.

Assume there are two sewer users, both of whom are assigned 33 EDUs of capacity, but one uses 4,000 gallons per day and the other uses half that amount, or 2,000 gallons per day. Please note that 33 EDUs times 200 gallons per day per EDU equals an assigned capacity of 6,600 gallons per day. Under the adopted metered rates their quarterly bills would be as follows:

FIRST USER (the load factor is 4000/6600 or about 60%) BILL:

4,000 GPD x 90 days or 360,000 gallons/qtr x \$0.0046 per gallon	\$1,656
Plus \$93.75 x 33 Equivalent Dwelling Units (“EDUs”)	<u>3,094</u>
Total charge:	\$4,750 per quarter

Average cost per gallon	(\$4,750 / 360,000 gallons)	\$0.0132
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SECOND USER (the load factor is 2000/6600 or about 30%) BILL:

2,000 GPD x 90 days or 180,000 gallons/qtr x \$0.0046 per gallon	\$ 828
Plus \$93.75 x 33 Equivalent Dwelling Units (“EDUs”)	<u>3,094</u>
Total charge:	\$3,922 per quarter

Average cost per gallon	(\$3,922 / 360,000 gallons)	\$0.0218
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Please note that the average unit cost for the first user with a load factor of 60%, \$0.0132 per gallon, is less than the single volumetric rate developed below in Point No. 5, i.e., \$0.01581 per gallon, by approximately 17 percent.

Another example of a “poor” and therefore “costly” load factor is if an individual hired a truck and driver to wait in front of his business, with the motor running, all day, every day, but then only required “deliveries” to be made for a few hours per day. This is an exaggerated example but it is similar to what happens with sewer service. The Town has provided capacity that is ready to receive wastewater all day, every day. If a user only discharges part of the day, or part of a month, or for only part of the year, the Town still incurs the cost of having the sewer system ready and waiting.

Based on this analysis, it seems that the primary beneficiaries of a “simple” single volumetric rate are users with the poorer load factors.

Point No. 5: It has been suggested that a simple way of dealing with the high capacity charge would be to apply a single flat rate per gallon for all usage. However, in my experience this approach can work when all or almost all of the users are metered. When that happens in Charlton, then this approach could be considered. To implement this approach today would have unattractive and potentially serious consequences. The following describes this approach, and some of the possible consequences.

FY 2009 Revenue required (see Schedule 1 of the Dec 17 presentation)	\$1,126,000
Divide by Total estimated metered volume in gallons per year	<u>71,229,750</u>
Rate if all costs recovered from metered consumption	\$0.01581 per gallon

One consequence of implementing this rate today is a loss in revenue from those users who are presently billed on metered rates. If this rate were applied to the 54 users billed at metered rates, as shown on Schedule 4 of the Dec 17 presentation, then the revenue derived from these users would be approximately \$123,600, or about \$21,000 less than under the adopted rates. This would be a benefit to those users. However, to balance the budget the shortfall in revenue would have to be made up from other users. Increasing the Title V rate of \$70 per bedroom by \$2.36

would make up the shortfall. But that is approximately a 3.3% increase to those users. If another 54 similar users convert then a second 3.3% increase would be required to make up their shortfall; and so on.

A second, perhaps more significant, consequence of the pure “volumetric rate” approach is the impact on the average residential customer. The average single family use is estimated at 200 gallons per day, or 18,000 gallons per quarter. At a rate of \$0.01581 per gallon, this user’s quarterly bill would be \$284.58. Under the adopted rates this user’s quarterly bill would be \$176.55 (see Point 3 above for the calculation). Adopting a single volumetric approach would cause a 60+ percent increase for the average residential user and would require him or her to pay \$108.03 per quarter, or \$432.12 per year, more than under the adopted rates.

Point No. 6: For some users the adopted metered rates do provide savings, as intended by the Board, over the Title V rates. Approximately 56 out of a total of over 500 users are now being billed the metered rates. Schedule 7 presented at the December 17 meeting, shows the savings or increases in bills for 50 of these users.¹ Three users show an increase in billing, while 47 show savings. The average savings was approximately 31 percent.

Point No. 7: Until all users have converted to metered rates, it will be necessary to use the Title V rate structure. Therefore it bears repeating the following paragraph from the 2006 rate report.

The current system of user charges is based on the committed treatment capacity allocated to each sewer user. For residential and most commercial users this capacity is based on the Title V capacity requirements defined by the Massachusetts Department of Environmental Protection (“DEP”) as 110 gallons per day per bedroom or bedroom equivalent. Two sewer users, the MTA and Masonic Home, have specified committed capacities by agreement with the Town. Under the current system of user charges operating costs are assigned to each sewer user in proportion to their committed capacity. In effect this system uses the committed capacity as a basis for estimating the actual use by each sewer user. Given the fact that very few of the sewer users have metered sewer flow or metered water consumption, **the Title V capacity rate provides a reasonable basis for allocating operating costs.** (Page 1, emp. added)

¹ The original data indicated four users experienced increased billing. The Schedule 7 originally included in the December 17 package has been corrected and revised and is attached hereto.

Point No. 8: The new metered rate was designed to continue using “capacity” charges as a major component of the rate structure. Generally the fixed or basic charge portion of the rate structure is based on recovering administrative costs related to billing and metering. These charges are typically in the \$30 - \$40 per quarter range. However, where there are significant seasonal users, either present during the summer only, such as on Cape Cod, or not present during the winter, some communities include a capacity cost component in the fixed or basic charge. I recommended such a charge for a regulated water company in Connecticut, which was approved by that regulatory commission. Additionally, when sewer rates were required by the EPA as part of the grant conditions, many communities adopted an equivalent dwelling unit form of sewer charge, primarily because metered volume data was not readily available. The 2006 Tighe & Bond Sewer Rate Survey indicates that approximately 25 communities in Massachusetts, or 13% of the respondents to their survey, still use a flat fee for their sewer user charges.

Changing the Split between Capacity and Volumetric Charges

The adopted metered rates were based on a combination of the committed capacity and estimated metered consumption. Under the adopted rates, operating costs were divided between costs which vary with actual consumption (i.e., sewer flow) called “variable costs” and costs which do not vary with actual consumption called “fixed costs”. The adopted rates were designed to recover the fixed costs through the “capacity charge” and to recover the variable costs through the volumetric charge. Based on the FY 2007 budget, fixed costs were determined to be 65% of the total operating cost, and variable costs were 35% of the total. A series of alternative “splits” were analyzed. The resulting rates and an analysis of the impact on user bills are presented below. Based on the analysis conducted changing the split between capacity charges and volumetric charges is not recommended at this time.

	<u>Capacity Charge</u>	<u>Rate per Gallon</u>
The 65/35 Scenario (adopted June 2006)	\$93.75	\$0.0046
The 55/45 Scenario	\$79.75	\$0.0059
The 50/50 Scenario	\$72.50	\$0.0066
The 40/60 Scenario	\$58.00	\$0.0079
The 30/70 Scenario	\$43.50	\$0.0092

It was observed at the Dec 17 meeting that as one moves away from the 65/35 split, the effect is increasing the billed amounts for residential users, no matter how many bedrooms they were billed for under Title V rates. For instance, a one bedroom user under the adopted metered rate would see an increase 152%. The increase grows as the split shifts under each scenario – to 166% under the first scenario, then to 173%, then 186% and finally 199%. Similarly a five bedroom user would see the savings erode. Under the adopted rates the five bedroom user would see savings of 50%. But these savings decrease under each alternative scenario because his metered bill increases, to 47%, then 45%, then 43% and finally 40% under the last scenario. The detailed results are shown on TABLE 1 attached at the end of this letter report.

CONCLUDING REMARKS

The most appropriate basis for changing the rates should be to use the budget for FY 2009. This information is not yet available. Therefore, a rate change may be required when that information is known. In addition, the revenue required from the two MTA service areas, as described below, has not been finally determined. The rates charged to all other sewer users cannot be firmly established until that revenue contribution is known.

In the June 2006 rate study approximately \$360,000 per year was allocated to the MTA, or approximately 38% of the total annual revenue required from rates. The MTA's tenant, McDonalds, is responsible for paying the sewer charges and has raised objections about the increased allocation. Under Title V their sewer bill, based on \$70 per quarter per equivalent bedroom unit, would be approximately \$224,000. Therefore, the adopted metered rates, plus the adopted surcharges for excess strength wastewater, result in an increase to them of

approximately 60%. Actual surcharge bills in 2007 have exceeded the amounts assumed in the 2006 rate study.

Discussions with McDonalds are ongoing. They have hired a rate consultant who has raised questions about the allocation methodology. Our review of his questions is ongoing and needs additional strength of waste data for both the wastewater being discharged by McDonalds and the total influent into the Charlton treatment plant.

Conclusions

In general people expect to pay fair rates for sewer service. In general, fair sewer rates are based on metered volume. However, it is not always possible or practical to meter all sewer users. In fact, as note above, 25 communities in the Commonwealth use a flat fee sewer charge. Nevertheless, the Charlton Board of Water and Sewer Commissioners adopted a policy of implementing metered rates and faced a substantial problem to overcome in order to do so. The adoption in June 2006 of metered was a first step. As stated in the following paragraph the Board fully understood that subsequent steps would be required.

As a result of changing the basic structure of the user charge system, some sewer users will experience **increased** bills under the proposed rates, while others will experience **decreased** bills, depending on the relationship between each users committed capacity and their “actual” use. (As used herein “actual” use has been estimated. As meters are installed on the private well supplies, the actual usage data will be used for billing purposes. It may be necessary to revise the proposed rates when sufficient actual usage data has been accumulated.)
(Page 2, June 2006 Rate Report)

I believe the Board carefully examined the impacts of the new metered rates and recognized that price alone would not encourage users with 1 or 2 bedrooms, in general, to convert to meters. However, the Title V rate has a severe impact on users with 3, 4, 5 or more bedrooms and some businesses and the Board decided that the remedy for those users was the place to start.

Based on the analysis conducted to date and presented above, it appears that the best course of action regarding changing the rate structure is to continue the currently adopted rates at least until the FY 2009 budget is available and discussions regarding the MTA allocation have been completed.

Very truly yours,
ALCOTT ASSOCIATES

/s/

Stephen B. Alcott

ATTACHMENTS:

TABLE 1 COMPARISON OF ALTERNATIVE SCENARIOS IMPACT ON
AVERAGE RESIDENTIAL USER

SCHEDULE 7 EXPERIENCE IN 2007 OF CONVERSIONS FROM TITLE V TO
METERED RATES (revised)

TABLE 1
COMPARISON OF ALTERNATIVE SCENARIOS
IMPACT ON AVERAGE RESIDENTIAL USER*

No. of Bedrooms	Title V Quarterly Charge \$70 per Bedroom	Possible Metered Rates			Change	Percent
		Quarterly Capacity Charge	Quarterly Volume Charge	Total Quarterly Charge		
The 65/35 Scenario - the Basis Adopted June 2006						
1	70.00	93.75	82.80	176.55	106.55	152%
2	140.00	93.75	82.80	176.55	36.55	26%
3	210.00	93.75	82.80	176.55	(33.45)	-16%
4	280.00	93.75	82.80	176.55	(103.45)	-37%
5	350.00	93.75	82.80	176.55	(173.45)	-50%
The 55/45 Scenario						
1	70.00	79.75	106.20	185.95	115.95	166%
2	140.00	79.75	106.20	185.95	45.95	33%
3	210.00	79.75	106.20	185.95	(24.05)	-11%
4	280.00	79.75	106.20	185.95	(94.05)	-34%
5	350.00	79.75	106.20	185.95	(164.05)	-47%
The 50/50 Scenario						
1	70.00	72.50	118.80	191.30	121.30	173%
2	140.00	72.50	118.80	191.30	51.30	37%
3	210.00	72.50	118.80	191.30	(18.70)	-9%
4	280.00	72.50	118.80	191.30	(88.70)	-32%
5	350.00	72.50	118.80	191.30	(158.70)	-45%
The 40/60 Scenario						
1	70.00	58.00	142.20	200.20	130.20	186%
2	140.00	58.00	142.20	200.20	60.20	43%
3	210.00	58.00	142.20	200.20	(9.80)	-5%
4	280.00	58.00	142.20	200.20	(79.80)	-29%
5	350.00	58.00	142.20	200.20	(149.80)	-43%
The 30/70 Scenario						
1	70.00	43.50	165.60	209.10	139.10	199%
2	140.00	43.50	165.60	209.10	69.10	49%
3	210.00	43.50	165.60	209.10	(0.90)	0%
4	280.00	43.50	165.60	209.10	(70.90)	-25%
5	350.00	43.50	165.60	209.10	(140.90)	-40%

NOTE * The average residential user is assumed to have a quarterly metered volume of 18,000.

CHARLTON SEWER RATE STUDY

Schedule 7 (Rev. 1/14/08)

Experience in 2007 of conversions from Title V to Metered Rates

Line No.	UNITS	TITLE V CHARGE	Mtr Units (EDUs)	Avg Mtr Bill in 2007	Savings or (increase)
Commercial/Municipal Users					
1	76.36	5,345.20	42.0	4,888.66	456.54
2	7.27	508.90	2.0	225.34	283.56
3	15.22	1,065.40	8.37	921.95	143.45
4	9.55	668.50	5.25	533.46	135.04
5	5.86	410.20	3.23	357.85	52.35
6	39.77	2,783.90	21.9	2,739.64	44.26
7	48.27	3,378.90	26.6	3,337.37	41.53
8	1.82	127.40	1.0	104.98	22.42
9	5.94	415.80	3.27	402.88	12.92
Apartments/Multi-Family Users					
	BRs				
10	48	3,360.00	24	3,162.66	197.34
11	4	280.00	4	549.36	(269.36)
12	13	910.00	13	1,547.34	(637.34)
13	6	420.00	3	491.09	(71.09)
Single Family Users					
14	5	350.00	1	131.59	218.41
15	5	350.00	1	155.67	194.33
16	4	280.00	1	104.07	175.93
17	4	280.00	1	117.83	162.17
18	5	350.00	1	197.71	152.29
19	4	280.00	1	136.75	143.25
20	4	280.00	1	140.65	139.35
21	4	280.00	1	140.76	139.24
22	4	280.00	1	145.28	134.72
23	4	280.00	1	162.51	117.50
24	4	280.00	1	165.41	114.59
25	3	210.00	1	102.39	107.62
26	3	210.00	1	105.10	104.90
27	3	210.00	1	105.77	104.23
28	3	210.00	1	106.36	103.64
29	3	210.00	1	114.39	95.61
30	3	210.00	1	122.97	87.03
31	4	280.00	1	196.66	83.34
32	4	280.00	1	199.86	80.15
33	3	210.00	1	133.49	76.52
34	3	210.00	1	138.07	71.93
35	3	210.00	1	138.47	71.53
36	3	210.00	1	138.47	71.53
37	3	210.00	1	144.20	65.80
38	3	210.00	1	146.36	63.64
39	3	210.00	1	151.08	58.92
40	3	210.00	1	152.23	57.77
41	3	210.00	1	156.59	53.42
42	4	280.00	1	230.98	49.03
43	3	210.00	1	164.27	45.73
44	3	210.00	1	164.84	45.16
45	3	210.00	1	168.93	41.07
46	2	140.00	1	100.61	39.39
47	2	140.00	1	102.35	37.65
48	2	140.00	1	111.13	28.87
49	3	210.00	1	207.24	2.76
50	2	140.00	1	139.39	0.61