

May 24, 2006



Chittenden Solid Waste District
1021 Redmond Road
Williston, Vermont 05495

Ladies and Gentlemen:

Subject: Review of Solid Waste Generation Rates

Introduction

R. W. Beck, Inc. (“Beck”) has prepared this letter (the “Letter”) at the request of the Chittenden Solid Waste District (“CSWD”) related to Beck’s experience in preparing estimates of future solid waste generation rates. Beck has developed estimates of the quantity of solid waste generated for inclusion in independent engineer’s reports Beck has prepared as part of the issuance of revenue bonds for the financing of solid waste management facilities.

In preparing estimates of future solid waste generation rates, Beck considers the following:

1. Historical and projected population estimates
2. The historical and projected level of recycling in the waste shed.
3. The major types of commercial and industrial activities in the waste shed.
4. The relative economic strength of the economy in the waste shed.
5. Historical waste generation rates, net of recycling.

In the preparation of this Letter, Beck has reviewed: (1) historical data provided by CSWD regarding the population of the waste shed and the tonnage disposed; (2) projected population estimates from the Vermont AOT-EIS Study for Circumferential Highway; (3) United States Environmental Protection Agency (“USEPA”) reports on waste generation in the United States; and (4) reports on solid waste generation in Vermont from 1999 to 2004.

Historical Waste Generation in CSWD

Presented in Table 1 is a summary of the historical waste quantities disposed by CSWD during the period 1993 through 2005.

Table 1
 Historical Waste Quantities Disposed by CSWD ⁽¹⁾

Year	Tonnage Disposed (000 tons)			Population (000)	PCD Rate (lbs/capita per day)			% Increase from Previous Year
	MSW	C&D	Total		MSW	C&D	Total	
1993	79	16	94	133	3.24	0.64	3.88	---
1994	82	16	99	135	3.35	0.66	4.01	3.4
1995	82	17	99	137	3.28	0.69	3.97	<1.0>
1996	82	21	103	138	3.23	0.84	4.07	2.5
1997	82	23	106	139	3.25	0.92	4.17	2.5
1998	92	29	121	141	3.58	1.14	4.72	13.2
1999	93	30	123	142	3.57	1.16	4.74	0.4
2000	96	33	129	144	3.67	1.25	4.91	3.6
2001	95	41	137	145	3.61	1.57	5.17	5.3
2002	96	36	132	145	3.62	1.34	5.97	<3.8>
2003	99	38	137	147	3.68	1.40	5.07	2.0
2004	104	43	146	150	3.79	1.56	5.36	5.7
2005	104	41	145	150	3.78	1.56	5.29	<1.3>

(1) Source: CSWD

Note: Totals may not add due to rounding

The information in Table 1 indicates that during the last 12 years, the solid waste generation rate, expressed in pounds per capita per day (“PCD”), has increased from 3.88 to 5.29, a total increase of 36.3 percent, and a compound growth rate of 2.63 percent per year over the 12 year period. However, in the last five years, the PCD rate has increased from 5.17 in 2001 to 5.29 in 2005, a total increase of 2.3 percent and a compound rate of increase of only 0.5 percent per year. The average PCD rate for the same five year period is 5.17. This data indicates that during the last five years, the rate of increase in CSWD’s PCD rate has slowed. Further review of the data in Table 1 indicates that much of the increase during the last 12 years in the total PCD rate has been associated with the increase in the construction and demolition (“C&D”) component of the waste stream which increased by 136 percent from 0.64 PCD in 1993 to 1.51 PCD in 2005. Meanwhile, the increase in the municipal solid waste (“MSW”) generation rate during the same 12 year time period was 17 percent from 3.24 PCD in 1993 to 3.78 PCD in 2005.

The information in Table 1 regarding the generation of MSW is consistent with what Beck has observed in other parts of the United States. In general, the PCD rate for MSW generally increased during the latter part of the 1990s. Such period of increase followed an economic

recession in the early 1990s, as well as the advent of increased levels of recycling. The percentage of recycled material has stabilized in many parts of the United States.

Historical Waste Generation in Vermont

For the purpose of this Letter, Beck has reviewed information posted by the Vermont Department of Environmental Conservation (“DEC”) on solid waste generation in the entire state of Vermont. A summary of that information is presented in Table 2.

Table 2
 Disposal of Municipal Solid Waste in Vermont ⁽¹⁾

Year	Tonnage Disposed (000 tons)			Population (000)	PCD Rate (lbs/capita per day)		
	MSW	C&D	Total		MSW	C&D	Total
1999	364	59	422	594	3.36	0.54	3.90
2000	387	82	469	609	3.48	0.74	4.22
2001	415	91	506	613	3.71	0.81	4.52
2002	428	72	500	618	3.79	0.64	4.42
2003	418	85	476	623	3.68	0.75	4.43
2004	455	97	552	629	3.96	0.85	4.81

(1) Source: Vermont DEC

The information in Table 2 indicates that the State of Vermont as a whole has experienced a lower PCD rate during the last six years than CSWD with most of the difference attributable to the fact that CSWD has had a higher C&D disposal rate than the state as a whole. The State of Vermont’s compound growth rate during the last four years (2001 to 2004) has been approximately 1.5 percent with most of the reported increase having occurred in 2004. The state-wide MSW PCD rate is fairly close to CSWD’s PCD rate for MSW.

Historical Waste Generation in Neighboring States

Beck also reviewed posted historical waste generation rates in the neighboring state of New Hampshire for the period 1998 to 2001. A summary of certain information from the New Hampshire Department of Environmental Sciences (“DES”) is presented in Table 3.

Table 3
 Historical Waste Generation in New Hampshire ⁽¹⁾

Year	Solid Waste Generated (000 tons)			Population ⁽³⁾ (000)	PCD Rate (lbs/capita per day)		
	Residential	C&D	Total		MSW	C&D	Total
1998	1,143	152	1,295	1,185	5.29	0.70	5.99
1999	1,326	160	1,486	1,201	6.05	0.73	6.78
2000	1,384	234 ⁽²⁾	1,618	1,236	6.14	1.04	7.18
2001	1,367	257	1,624	1,274	5.88	1.11	6.99

(1) Source: New Hampshire DES.

(2) Increase is in part due to improved reporting and data collection.

(3) Source: New Hampshire Office of Energy and Planning.

The information in Table 3 represents generation rates prior to taking into account the effect of recycling. DES reported that New Hampshire had an overall recycling rate of 23 percent in 2001. Reducing the total PCD rate of 6.99 in 2001 by 23 percent results in a net disposal rate of approximately 5.38 which is significantly greater than the PCD rate reported for the entire State of Vermont for the same year (4.52). However, what is of interest in Table 3 is that the average PCD rate for the three year period 1999 to 2001 averaged 6.98 which was very close to the total reported rate for 2001 of 6.99. This may be indicative that the per capita generation rate in New Hampshire may have been leveling off by 2001. DES reported that it believes its relatively higher PCD rate is due to the fact that New Hampshire experienced an economic upsurge during the 1998 to 2001 time period.

Beck obtained similar information which was posted for the neighboring State of Massachusetts for the period 1999 to 2003 from the Massachusetts Department of Environmental Protection (“DEP”).

Table 4
 Historical Solid Waste Disposed in Massachusetts ⁽¹⁾

Year	Solid Waste (000 tons)			Population ⁽²⁾ (000)	PCD Rate (lbs/capita per day)		
	MSW	C&D	Total		MSW	C&D	Total
1999	5,450	1,060	6,510	6,175	4.84	0.91	5.75
2000	5,710	750	6,460	6,349	4.93	0.65	5.58
2001	5,660	680	6,340	6,395	4.85	0.58	5.43
2002	5,870	580	6,450	6,413	5.02	0.50	5.52
2003	5,950	390	6,340	6,420	5.08	0.33	5.41

(1) Source: Massachusetts DEP.

(2) Source: US Census Bureau.

The data in Table 4 indicates that the total quantity of waste in Massachusetts requiring disposal has been decreasing. Much of that apparent reduction is associated with the fact that Massachusetts has been increasing the amount of solid waste which is being recycled through C&D diversion and commercial recycling. This reduction in the quantity of waste requiring disposal occurred during a time when the total amount of MSW and C&D being generated in Massachusetts increased from 12,550,000 tons in 1999 to 13,210,000 tons in 2003. What is important for the purpose of this Letter is that the PCD rate for disposal actually decreased during the period 1999 through 2003, although it remained relatively level during the period 2001 through 2003.

Comparative Review

The information in Tables 1 through 4 indicate certain of the variables which potentially could impact the PCD rate for CSWD.

1. CSWD has had a higher PCD rate than the rest of the State of Vermont because the amount of C&D material in CSWD has been approximately twice the rate for the balance of the State. Increased quantities of C&D material are often indicative of an improved economy associated with the construction of new buildings and the removal of old buildings. How long will that level of economic activity continue in the CSWD service area?
2. The State of New Hampshire believes that its higher PCD level is due to the economic upturn in New Hampshire in the late 1990s. In spite of this, the State of New Hampshire reported a relatively level PCD rate for the 1999 to 2001 time period.

3. The State of Massachusetts has managed to increase the amount of C&D material which is being diverted from disposal as well as increase the amount of recycling in the state. The net result has been a net decrease in the amount of waste requiring disposal.

The information for the states of Vermont, New Hampshire, and Massachusetts indicates that the rate of increase in the PCD has been leveling off in recent years.

Beck believes that the total quantity of solid waste requiring disposal from the CSWD service area will be impacted by a combination of changes in population and the overall level of economic development in the area. Based on this belief, the methodology which Beck would use in the projection of future waste quantities would take into account the projected population of the service area and a small increase in the PCD rate. For the purpose of this Letter, Beck has assumed that the PCD rate for the MSW portion of the waste stream will continue to experience a compound rate of increase of approximately 0.5 percent per year for the next ten years to reflect the historical rate of increase of the last five years, and will then increase at a rate of 0.25 percent per year thereafter. Beck has also assumed the C&D rate will remain level with no additional increase as the PCD for C&D is already twice the state average.

Presented in Table 5 is a summary of the type of approach Beck would utilize in estimating the future waste quantities of CSWD for the next 20 years.

Table 5
Approach to Estimating Solid Waste Quantities Requiring Disposal

Year	Population ⁽¹⁾	MSW PCD Rate ⁽²⁾	C&D PCD Rate ⁽³⁾	Total PCD Rate	Total Waste Quantities
2005	150,239	3.78	1.51	5.29	145,000
2010	156,530	3.88	1.51	5.39	154,000
2015	163,168	3.97	1.51	5.48	163,200
2020	171,114	4.02	1.51	5.53	172,700
2025	180,037	4.07	1.51	5.58	183,300

(1) Source: Vermont AOT-EIS Study for Circumferential Highway.

(2) Assumed to increase 0.5 percent per year for ten years and 0.25 percent per year thereafter.

(3) Assumed to remain level.

Summary

Beck has made the following observations as discussed in this Letter.

1. During the last five years, CSWD has experienced a compound growth rate of 0.5 percent per year in the PCD rate of MSW delivered to CSWD.

2. CSWD has experienced a C&D disposal rate which is twice the reported rate for the State of Vermont as a whole.
3. The State of Vermont reported a total PCD rate that was increasing at a compound rate of approximately 1.5 percent for the period 2001 through 2004.
4. The State of New Hampshire reported a relatively flat PCD generation rate for the period 1999 through 2001.
5. The State of Massachusetts reported a declining PCD disposal rate for the period 1999 through 2003.
6. Population and economic growth and activities are the two factors which have the greatest impact on solid waste generation.
7. The methodology discussed herein for estimating future waste quantities is consistent with the methodology Beck has used on other projects.

Respectfully submitted,

R. W. BECK, INC.