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August 23, 2011

To: Hamilton Board of Selectmen
Wenham Board of Selectmen
Fr: SMART Work Group (M. Johnson, M. Lombardo, J. Chelgren, G. Clark, D. Mena,
J. Tomasz, S. Patroliia, C. Dann)
Re: Organic Recycling and PAYT

Executive Summary

The Towns of Hamilton and Wenham have an opportunity to institute a PAYT program in conjunction with town-wide organic recycling which will shift tonnage from solid waste collection and disposal costs. The lower solid waste disposal costs and PAYT bag revenues will lower general fund expenses related to trash and recycling. The benefits to citizens are a substantially more convenient recycling program than the current WRP system. The towns would also be positioned to take advantage of significant financial benefits by potentially diverting organics to an anaerobic digester at the Hamilton town landfill.

Background

The Towns of Hamilton and Wenham have collaborated to reduce their waste for several years. They use the same hauler, collect the same items, and have the same disposal contract with the Wheelabrator North Andover incinerator.

Both towns implemented a "Waste Reduction Program" in which residents are allowed one 35-gallon barrel of trash per week and set the same price for overflow bags of solid waste (currently \$1.75 for a large bag).

More than a year ago, both towns initiated an innovative weekly curbside collection program separating organic material from solid waste. There are currently 609 households (429 in Hamilton and 180 in Wenham) who, on average, divert more than three (3) tons of organic material each week to Brick Ends Farm, a Hamilton farm-based compost operation, where it is composted.

While waste reduction is laudable from ecological and cost-saving perspectives, it is important to also note the future direction of waste management from a regulatory and legislative perspective.

In the *Draft 2010-2020 Solid Waste Master Plan*, the Massachusetts Department of Environmental Protection (MDEP) has set a goal of “reducing annual solid waste disposal by 30% by 2020...through varying combinations of source reduction, recycling, and composting...” and by 2050 the goal is to reduce residential and commercial waste by 80%.

One of the primary objectives identified by MDEP to meet the aforementioned goal is to *maximize recycling* by “increasing residential recycling and composting through development of cost-effective municipal and regional residential programs with paper and organics as priority materials.”

Another objective is to “develop integrated solid waste management systems that achieve the objective of maximizing recycling and composting and minimizing residual materials in need of disposal.”

We believe that the Hamilton–Wenham Waste Reduction Program, which includes curbside organic recycling, has been an informative and beneficial first step toward the development of a sustainable town-wide program; a program that has the potential to serve as a model throughout the state for municipal curbside organic recycling.

But more importantly, we believe that our efforts to-date put us at the forefront to capitalize on the objectives set forth by MDEP to dramatically reduce annual solid waste disposal costs and serve as a regional hub for organic recycling, with significant revenue generating opportunities.

The following memo identifies the challenges and opportunities for expanding the Waste Reduction Program to include migration to a full pay-as-you-throw (PAYT) program and makes specific recommendations for expanding curbside organic recycling town-wide.

The Challenge

By all accounts the Waste Reduction Program (WRP) has been effective in reducing annual solid waste disposal in the Towns of Hamilton and Wenham. Upon inception of the source-separated (homeowners use separate bins for paper, glass, etc.) recycling program in FY08, recycling in Hamilton increased significantly. Wenham implemented the same program a year later with similar success.

In comparing waste reduction from FY2007 to FY2010, Hamilton realized annual cost-savings of \$42,000, and Wenham \$36,000 for **disposal fees**.

HAMILTON

	FY07		FY08		FY09		FY10	
	tons	%	tons	%	tons	%	tons	%
Solid Waste Tonnage	2529.38	73.67%	1846.65	63.84%	1940.89	68.59%	1871.40	69.70%
Recycling Tonnage	904.1	26.33%	1046.04	36.16%	888.75	31.41%	813.37	30.30%
Total Tonnage	3433.48	100.00%	2892.69	100.00%	2829.64	100.00%	2684.77	100.00%

WENHAM

	FY07		FY08		FY09		FY10	
	tons	%	tons	%	tons	%	tons	%
Solid Waste Tonnage	1556.02	80.17%	1380.95	76.13%	1214.60	73.03%	977.54	66.07%
Recycling Tonnage	385	19.83%	433.1	23.87%	448.47	26.97%	501.92	33.93%
Total Tonnage	1941.02	100.00%	1814.05	100.00%	1663.07	100.00%	1479.46	100.00%

HAMILTON & WENHAM COMBINED

	FY07		FY08		FY09		FY10	
	tons	%	tons	%	tons	%	tons	%
Solid Waste Tonnage	4085.4	76.01%	3227.6	68.57%	3155.49	70.24%	2848.94	68.41%
Recycling Tonnage	1289.1	23.99%	1479.14	31.43%	1337.22	29.76%	1315.29	31.59%
Total Tonnage	5374.5	100.00%	4706.74	100.00%	4492.71	100.00%	4164.23	100.00%

Hamilton and Wenham residents are deservedly proud of the savings they have created by reducing the tonnage of solid waste disposed in the two towns. Although this is a good start, recycling rates have slipped in Hamilton and hover at the National average in Wenham; there are still challenges that, if overcome, could result in additional gains in recycling, further reductions in waste disposed as trash, and significant additional cost-savings to the Towns.

One of the challenges is the current structure of the WRP as a source-separated program. Research performed by Mass DEP, as well as several other states, identifies that source-separated or "dual-stream" recycling has several drawbacks, including:

- Putting more responsibility on residents for preparing and separating the various materials to be collected. This was often seen as a barrier to getting widespread public participation as it required more effort on the part of the participants and attracted only those individuals that were already motivated to recycle;
- The "bin is too full" conundrum for residents which results from both bi-weekly recycling and the use of containers that are too small. Residents often stop recycling when the bin is full.
- Limitations as to the types of materials that could be collected. As more materials were targeted for collection (i.e., cardboard, mixed paper, plastic containers, etc.) the number of separate compartments on collection vehicles increased reducing the capacity for any one material. This added to the cost of designing and/or modifying collection vehicles; and

- Higher costs for collection as it required two-person crews, more time spent at each stop, and shorter times on the collection route since once one compartment was full the truck would have to leave the route to dump its' load even if the other compartments still had capacity.

Another challenge is getting the organics out of the waste stream. Many studies show that organics represent as much as 1/3 of the total waste stream. This has been confirmed by the Hamilton-Wenham pilot program over the past 18 months. However, encouraging residents to compost at home on a voluntary basis has resulted in only token participation. Overcoming that challenge requires a convenient program coupled with either a mandatory requirement or a financial incentive.

Achieving outstanding results with our recycling and taking steps toward reaching statewide solid waste reduction goals locally is not likely to happen simply because it is "the right thing to do," because of the myriad environmental advantages, or the overall impact on reduced municipal spending; something more must be done.

The Opportunity

Depending on the source data used, it is estimated that 70-84% of all household waste can be recycled. Put another way, residents of the Towns of Hamilton and Wenham are removing less than half of all recyclable materials from their trash. At the current tipping fee of \$64/ton for **disposal**, unrecycled trash is costing taxpayers \$52,000-\$90,000 each year for the two town's combined.

There are at least four opportunities for further reductions: Single-Stream Recycling, weekly recycling collection, curbside organics collection, and financial incentives for waste reduction.

Single-Stream Recycling

The research done by MassDEP as well as many other states shows that the introduction of "Single-Stream Recycling" (SSR) has resulted in increases in recycling and reductions in solid waste. The advantages of single-stream recycling include simplicity for residents who no longer have to separate paper materials from glass, metal and plastic containers and may also include the opportunity to use larger collection containers such as barrels which avoids the "bin is full" problem.

A further advantage of SSR is the reduced collection costs for the hauler. This has led to the nation-wide trend in which many haulers are collecting recyclables using a single-compartment vehicle which carries a greater weight of material, the upgrading of nearly all recycling sorting facilities in the state of MA to accommodate SSR materials, and numerous haulers preferring to collect SSR compared to the dual-stream manner used currently in Hamilton and Wenham.

The switch to single stream also offers the opportunity to update the collection and processing system, including adding more paper grades such as junk mail, telephone

books and mixed residential paper; a good opportunity considering about 35% of all municipal solid waste is paper (EPA, 2005).

The City of San Francisco's recycling success further supports the research. Since changing from source-separated to single-stream collection a few years ago, the City now boasts a recycling rate of 72% according to their website - one of the highest in the nation.

We are also exploring the use of hinged carts and automated pick up which has the potential of reducing **collection costs** even further – we estimate at least \$75,000 in further savings.

Weekly Recycling Collection

Currently, trash collection is every week and recyclables every other week; the annual cost to the two towns for this service for FY2013 is \$448,941. Hamilton and Wenham have the ability to combine contracts with a common waste hauler that will enable us to collect recycling every week, which will help to avoid the "bin is full" problem.

Town-Wide Organic Recycling

The pilot curbside compost program has shown several significant results. One result is that the amount of compost that can be diverted from household waste can exceed the National average of 10lbs per household per week for similar programs -- participants generated at least 20% more than that (12-17 lbs per household per week) over the past 15 months.

Organic Compost collection is also weekly. Participation in the program has been optional to date at an additional fee of \$75 plus the cost of the bin. Like the town-wide collection of solid waste or recyclables, the curbside organic recycling program will be much more cost-effective if it is offered town-wide in the context of a program that has financial incentives such as unit-based pricing for solid waste.

Combining our waste reduction efforts through a common contract will afford the Towns' the opportunity to expand curbside organic composting town-wide on a weekly basis in both Hamilton and Wenham. The collection costs will be comparable to the current contracts that the two towns pay separately. At the present time the only additional up-front costs for the program will be the price of the organic composting bins; ~\$85,000. We anticipate some level of grant support from MDEP to assist in paying for the bins.

To cover the remaining cost of the bins and further incentivize waste reduction, we propose migrating to a full Pay-As-You-Throw Program, also known as a "Save Money As you Reduce Trash" or SMART program.

Financial Incentives for Greater Waste Reduction - SMART

SMART programs have been adopted elsewhere in Massachusetts in greater numbers than WRPs and have been enormously successful because they put *full cost control in*

the hands of the residents. In the proposed program, not only would residents have full cost control but they would have a full set of tools for waste reduction.

The current one-barrel free limit does not provide sufficient impetus to dramatically increase recycling or reduce solid waste in the two towns. The most successful impetus for waste reduction is a unit-based pricing program in which each unit of trash has a distinct cost.

The Environmental Protection Agency (EPA) and several states, such as Rhode Island, have identified that "...recycling rates often increase dramatically sometimes reaching double or triple what they had been previously" under a SMART format. With the elimination of the one-free bag, the towns will offer both a full-size and a half size bag at roughly half the price of the 35-gallon bag. With all these options, residents can reduce their trash and be able to minimize their own costs

The average Hamilton-Wenham household uses 11 33-gallon (large) overflow bags per year at a cost of \$19.25/year. The same average household would need at most, 60 half-size bags per year if actively recycling and utilizing the curbside organics program.

At a cost of \$60 per year (assuming \$1 per small bag) this translates to an additional \$40 per year for each household. And if the net savings from reduce **disposal costs** are used to lower overall costs to the Towns as anticipated, the annual increase per household is estimated to fall to below \$20 - a small price for a lot of service.

	Current Program		SMART MidPoint Potential		SMART Full Potential	
Solid Waste Tonnage	2848.9	68%	1,667.7	40%	667.0	16%
Recycling Tonnage	1141.6	28%	1,873.9	45%	2,248.7	54%
Organic Tonnage	173.7	4%	624.6	15%	1,248.5	30%
Total Tonnage	4164.2	100%	4,164.2	100%	4,164.2	100%
Collection Costs	\$448,941		\$436,224		\$436,224	
Disposal Costs						
Solid Waste	\$193,728		\$113,267		\$45,307	
Organic	\$24,823		\$24,985		\$49,971	
	\$667,492		\$574,476		\$531,501	
PAYT Bag Revenue			(296,000)		(222,000)	
Net Cost to Towns			\$278,476		\$309,501	
Bag Rev						
Unit Cost/HH in taxes	\$180/yr		\$75/yr		\$84/yr	
Unit Cost PAYT HH			\$80/yr		\$60/yr	

The PAYT bag revenue will be a function of each household's behavior. Both towns currently get the first trash barrel free and on average each household uses 11 large extra bags per year. That translates into \$110.25 per year per household (\$1.75 per bag * 52 weeks + \$19.25/year overflow bags mentioned above) before any savings from increasing recycling and removing organic waste from the trash stream. Household bag revenue will drop in proportion to the lower solid waste tonnage, but probably not less to less than one small bag per week. Thus the \$110/per year per household cost might drop to \$80 in the midpoint scenario and \$60 in the full scenario. The bag revenues in those scenarios for 3,700 households would be approximately \$296,000, and \$220,000 respectively.

With the combination of a SMART program, weekly recycling pick up and organics collection, the potential for savings is significant as demonstrated by the table above. If the Towns are successful in developing an Anaerobic Digester the annual costs for disposal may be reduced by as much as \$50,000/year or more.

PAYT from Individual Household Perspective

The current 1st barrel free structure of our WRP costs each household an average of approximately \$180 per year. With the PAYT structure individual households will be able to reduce their direct trash disposal costs from approximately \$110 per year to approximately \$60-80 per year depending on their degree of participation. Their tax component should on average drop to approximately \$75-\$84 per year. While individual household costs will vary as a function of their property's valuations, every household will get (i) weekly composting, (ii) weekly recycling, (iii) single stream recycling.

Potential basis for Anaerobic Digester

Town-wide organic composting opens the door for the potential development of an Anaerobic Digester, with long-term revenue potential through the collection of tipping fees and the generation of biogas and electricity.

The former Hamilton landfill is a possible site for an organic waste recycling project that could serve the region, encourage other towns to adopt similar SMART programs and curbside organic recycling, and bring in considerable revenue.

A grant is pending to study the feasibility of the proposed project. But early conversations with MassDEP speak well to the viability of the project. It is estimated that the landfill site may comfortably support a 100 – 150 ton/day Digester. Using the current statewide average tipping fee, either size facility could generate gross receipts of over \$1 million per year, and the potential revenue implications for the generation of electricity and/or biogas only make the prospect more attractive.

As "Green Communities" recognized by the Department of Energy Resources, Hamilton and Wenham are well positioned to receive additional future grants to support the proposed project.