



Hartford Solid Waste Committee

FINAL REPORT – Hartford Solid Waste Committee

Hartford, VT

Submitted to: Hartford Selectboard

**Chuck Wooster, Chair
Richard Grassi, Vice Chair
Sandra Mariotti
Alex Defelice
Simon Dennis
Matt Bucy
Rebecca White**

July 29, 2015

TABLE OF CONTENTS

TABLE OF CONTENTS..... ii

1 COMMITTEE CHARTER AND FORMATION..... 1

2 SOLID WASTE AND RECYCLING RESEARCH..... 1

3 FINDINGS AND RECOMMENDATIONS..... 2

3.1 Charge 1: The future of the Town’s recycling program (and, potentially, household solid waste collection) 2

3.1.1 Findings: 2

3.1.2 Recommendations:..... 3

3.2 Charge 2: The future of Hartford's Transfer Station..... 3

3.2.1 Findings: 3

3.2.2 Recommendations:..... 4

3.3 Charge 3: The role Hartford should play in a potential regional municipal solid waste (MSW) network 4

3.3.1 Findings: 4

3.3.2 Recommendations:..... 5

4 APPENDICES 6

4.1 Appendix I: Hartford Solid Waste Committee Interim Report to the Hartford Select Board 1

4.2 Appendix II: Opportunities for Regional Cooperation on Solid Waste Management in the Upper Connecticut River Valley – Final Report July 2014 – DSM 7

4.3 Appendix III: Operations Review of Hartford’s Transfer Station and Curbside Recycling Program – December 21, 2012 – DSM 38

4.4 Appendix IV: Draft Municipal Solid Waste Survey..... 50

4.5 Appendix V: Composting/Organics Management..... 54

1 COMMITTEE CHARTER AND FORMATION

The Hartford Solid Waste Committee (HSWC) was assembled by the Selectboard in October, 2013 and asked to advise the Selectboard on three topics:

- 1.) The future of the town's recycling program
- 2.) The future of Hartford's Transfer Station
- 3.) The role Hartford should play in a potential regional municipal solid waste (MSW) network

The Committee was formed as requested: "an [eight]-member sub-committee of the Selectboard made up of the Town Manager, Hunter Rieseberg; Director of Public Works, Rich Menge; two Selectboard members" (Simon Dennis and Bethany Fleishman); and four Town residents (Harry Kendrick, Todd Allen, Shawn Kelley, and Martha McDaniel). The Committee's composition has been stable throughout its existence, with approval of the Selectboard (*i.e.*, Ms. Fleishman remained on the Committee, despite rotating off the Selectboard).

Although the Committee was originally requested to submit its final conclusions to the first Selectboard meeting of August, 2014, the still-changing nature of the State's and the Town's management of municipal solid waste stimulated the then-sitting Selectboard to accept an interim report from the Committee in June, 2014 (attached, Appendix 1), with further conclusions to follow.

During this period, Hartford – in conjunction with Lebanon, Norwich, Hanover, and the Greater Upper Valley Solid Waste Management District (GUVSWD) - also commissioned DSM Environmental Services to advise concerning "the potential for shared solid waste management services to increase efficiency and/or reduce costs" (July 2014 report attached, Appendix 2). The Committee has also drawn conclusions from the DSM Environmental Services report for the Town of Hartford on the Transfer Station and the Curbside Recycling Program (December 2012 report attached, Appendix 3).

2 SOLID WASTE AND RECYCLING RESEARCH

As outlined in its June 2014 report, the HSWC has gained a considerable amount of subject matter knowledge during the course of its work. The Committee is struck by:

- the complexities of the enactment of Vermont's Act 148 (Universal Recycling law)
- the rapidly and continually changing nature of the recyclable materials market
- the challenges imposed by our rural location and relatively small population (challenging the cost-effectiveness of recycling efforts and solid waste disposal)
- the paucity of permitted landfill sites in Vermont

Throughout its deliberations, the HSWC has worked to consider all factors that come into play when making recommendations concerning MSW disposal. These include:

- the totality of environmental costs (e.g., fossil fuel expenditure)
- the totality of financial costs

- the possible impact of various options on individuals and local businesses (e.g., Town employees, small waste haulers)
- human nature (e.g., relative ease of no-sort recycling and resistance to change)
- impacts on personnel and municipal budgets

3 FINDINGS AND RECOMMENDATIONS

3.1 Charge 1: The future of the Town’s recycling program (and, potentially, household solid waste collection)

3.1.1 Findings:

- In its report to the four towns last summer, DSM indicated the single best program to improve solid waste/recycling in the Upper Valley would be for each town to have a single vendor providing curbside household solid waste and recycling collection.
- To better gauge community interest in this potential service, the Committee has developed a brief questionnaire for residents on this topic , and is prepared to work with the Selectboard to incorporate it into the budgeting questionnaire that is under consideration.
- Hartford voters supported curbside recycling at 2015 Town Meeting at a rate of seven in favor to one against.
- A one-year contract is currently being developed between the Town and Casella for curbside recycling pickup for FY2015-16. While a multi-year contract for curbside recycling pickup would reduce the annual cost to the Town, the Committee recommends a one-year contract be pursued for Fiscal Year 2016-17, as a longer contract would interfere with potential future plans to move to town-sponsored curbside MSW pickup.
- The Committee has focused on HOUSEHOLD recycling and solid waste processing. Act 148 stipulates that all public buildings have parallel collection of recyclables wherever trash containers are available in all public spaces by July 1, 2015 (except in restrooms).
- During its research and deliberations, the Committee was challenged by small waste haulers that consolidation of household solid waste collection would significantly impact their ability to remain in business. The Committee met with two of the haulers currently doing business in Hartford – More Waste Solutions and Beauchene’s Waste Service. F. Oakes Disposal, A.B.L.E. Waste Management and Northeast Waste could also be impacted.

3.1.2 Recommendations:

- For the foreseeable future, the Committee recommends the Selectboard continue to fund curbside recycling in the annual budgeting process.
- The Committee recommends issuing a survey (a draft for which is attached, Appendix 4) for the purpose of determining whether residents are in favor of town-sponsored curbside MSW collection.
- If the survey finds residents are in support of Town-sponsored household solid waste collection, the Committee recommends that the Town investigate town-sponsored curbside MSW pickup for FY 2016-17 and beyond. Key factors in this investigation include the funding mechanism and the impact on the hours of operation and business model of the Hartford Transfer Station and Recycling Center.
- In order to comply with the Solid Waste Implementation Plan (SWIP) the Committee recommends the Town establish a means to monitor, audit, and report on recycling within Town-owned buildings and schools on an ongoing basis.
- The Committee recommends the Town require any selected curbside recycling operator establish a program for ongoing communications about curbside recycling. Potential outlets could include the Town's website, the Hartford Listserv, Facebook pages (*e.g.* Town of Hartford, VT, Information Site), the *Valley News*, and Hartford Herald.

3.2 Charge 2: The future of Hartford's Transfer Station

3.2.1 Findings:

- There have long been concerns that the Lebanon landfill may, at some point in the future, discontinue taking pulverized construction and demolition (C&D) waste at no cost (apart from our trucking expense) from the Hartford Transfer Station.
- It is difficult to determine the "useful life" of the Lebanon landfill. As currently configured, it could remain open for more than 20 years. If it expands, its life could stretch out another 50 years.
- Recycling at the Transfer Station is currently close to a break-even operation. However, residents who use the Transfer Station for their recycling (and non-residents, who may account for as much as 40% of total users) are required to separate their recyclables while residents who take advantage of curbside recycling do not.
- Sales of sorted recyclables are an important source of transfer station revenue (tens of thousands of dollars). Change to single-stream would not only lose this income, but incur costs for contracting to have materials go to Casella's Materials Recovery Facility in Rutland, VT (@\$60/ton, 600 tons = \$36,000). A change to single-stream recycling at the transfer station probably wouldn't allow reduction in transfer station staffing because of myriad other functions the station fulfills.

- According to Act 148, as of July 1st, 2017, transfer stations must accept food scraps and food scrap generators of at least 18 tons/year (~100 pounds/day) must divert material to any certified facility that will accept it, within 20 miles.
- According to Act 148, on July 1st of 2020, food scraps will be banned from all landfills.
- More information on composting can be found in Appendix 5, attached.

3.2.2 Recommendations:

- If the Lebanon landfill discontinues acceptance of C&D under the present terms, the Committee recommends reevaluating the current Hartford Transfer Station business model.
- If the Town does enter into a town-wide Household Solid Waste/Recycling contract in the future, the Committee anticipates Transfer Station volumes could be significantly impacted. While the Committee does not foresee a scenario whereby the Transfer Station would cease operations, the Town should consider contingency plans to reduce operating expenses to offset reduced revenues.
- At present, the Committee recommends maintaining multi-stream recycling at the Transfer Station (as opposed to switching to “Zero Sort Recycling”). However, the Committee recommends the Town be prepared to reconsider the Transfer Station’s adherence to multi-stream recycling in the future.
- If Townwide curbside pickup of solid waste is instituted, the Town should carefully consider including weekly pickup of food scraps in the contract. The Committee envisions the following repeating schedule:
 - week 1: pickup of household solid waste for landfill (“trash”) plus food scraps
 - week 2: pickup of mandated recyclables plus food scraps.
- Broad public education about the best management of organic materials would be optimal. We remain unsure about how best to accomplish this.
- While the Town should be mindful that the Transfer Station must begin accepting food scraps as of July 1st 2017, this does not mean that the Town will be forced to create a composting operation, as the Town could divert unprocessed food scrap waste to an off-site certified composting facility.

3.3 Charge 3: The role Hartford should play in a potential regional municipal solid waste (MSW) network

3.3.1 Findings:

- One current example of regional collaboration is between the Towns of Hartford and Lebanon. Hartford currently gives its ground construction and demolition (C&D) materials to the Lebanon Landfill at no cost. This benefits both towns insofar as it provides free ground

cover to the Lebanon Landfill and free construction and demolition disposal to the Hartford Transfer Station.

- Other than Hazardous Household Waste (HHW), the Committee does not foresee any other significant opportunities at this time to pursue regional cooperation for solid waste management. A lack of follow-up (to the Committee's knowledge) after DSM's presentation of its report to the four towns in July 2014 suggests that the town managers are not experiencing a pressing need for regional collaboration. However, it is the Committee's understanding that HHW cooperation at the Transfer Station has town managers' attention and is slowly proceeding.
- While GUVSWD has certainly expressed interest in Hartford rejoining the District, the Committee sees few, if any, benefits to the Town. Furthermore, a downside of joining would be that the Town would likely be asked to share in debt service payments at some future date. In addition, the Committee has heard that the District is allowing some of its permits for the North Hartland landfill site to lapse.
- Composting may provide an opportunity for regional cooperation, but the Committee considers composting to be a long-term question that will see little or no progress in the next few years.
- The GUVSWD's permitted landfill site in North Hartland certainly has the potential to process compost, but it will be expensive to establish and operate. In the DSM report, it was estimated that establishing a regional compost facility would cost \$2 to \$3 million. This estimate was based on construction estimates prepared for Act 148 analysis. A smaller facility could be created for \$750,000 to \$1 million.

3.3.2 Recommendations:

- If the Lebanon landfill were to discontinue taking processed C&D materials from the Transfer Station, the Committee recommends the Town reevaluate the Transfer Station's business model. Potential solutions to the resulting financial shortfall could include reduction in hours of operation, finding additional sources of revenue through increased ticket cost, or entering into negotiations with the GUVSWD regarding the transfer of some management responsibility for the Transfer Station to the GUVSWD.
- If the GUVSWD develops a composting facility at its North Hartland site, the Committee believes Hartford would be able to send composting to the facility without having to rejoin GUVSWD, as the District will need the volume of food scraps that would be generated by Town residents.

4 APPENDICES

4.1 Appendix I: Hartford Solid Waste Committee Interim Report to the Hartford Select Board

July 2, 2014

Committee's charter: make recommendations to the Town about:

1. The future of Hartford's recycling program
2. The future of the Hartford Solid Waste/Recycling Transfer Center
3. The role Hartford should play in a potential regional Municipal Solid Waste network

Purpose of this report:

1. Educate the Select Board on solid waste/recycling information in advance of the presentation by DSM Environmental Services (DSM) of its report, report, "Regional Cooperation on Solid Waste Management" on July 15, 2014 at 7 PM at the VA Hospital
2. Provide the Select Board with the facts of the future of solid waste and recycling in Vermont (sections 1 through 4)
3. Identify the options and issues that the Solid Waste Advisory Committee see need to be addressed for it to complete its charter (sections 5 through 8)

Note: The Committee recognizes it has much work to do in preparing recommendations to the Town. The presentation by DSM to the report's constituencies – Hartford, Norwich, Lebanon, Hanover, Greater Upper Valley Solid Waste Management District (GUVSWD) – and the discussions it generates are expected to inform the Committee as it works to finalize its research and analysis and develop its recommendations.

Terms, acronyms and definitions useful in understanding solid waste management and recycling

ANR – Vermont Agency of Natural Resources

C&D – construction and demolition materials (wood, asphalt, drywall/gypsum); "clean" C&D (from new construction) is readily reusable, especially if sorted at a construction site; C&D generated by demolition activities is more difficult (though not impossible) to sort and reuse

HHW – household hazardous waste

HSW – household solid waste

MRF – material recycling facility (Casella hauls all recyclables to its MRF in Rutland)

MSW – municipal solid waste

NRRA – Northeast Resource Recovery Association; Hartford is a member town; from the NRRA website:

The NRRA provides cooperative purchasing programs, educational and networking opportunities, technical assistance, and cooperative marketing programs... for establishing innovative grassroots recyclables marketing cooperatives with competitive pricing which enable...communities to manage their own recycling programs.

Organics – food scraps, yard debris; compostable materials

Single-stream (or zero-sort) recycling – the current trend in recycling; all recyclables are comingled at curbside collection point and sorted at a MRF; leads to higher household participation rates

Dual-stream recycling – municipalities separate paper/cardboard from plastics/cans/bottles; enables municipalities to realize greater revenues from recyclable sales but also negatively impacts household participation rates

WMD – waste management district

Individuals/organizations that have met with the Committee since November, 2013:

- Ted Siegler, DSM Environmental Services, Inc.
- Tom Kennedy, Executive Director, Paul Haskell and Neil Fulton, board members; GUVSWD
- Jim Toher, Casella
- Bob Vahey, Manager, Hartford Solid Waste/Recycling Transfer Center
- Vicky Davis, Upper Valley Lake Sunapee Regional Planning Commission
- Michael Durfor, Executive Director, and Bonnie Betheune, Member Services Manager; NRRA
- Steve Schneider, Enfield Town Manager
- Bob Spencer, Executive Director, Windham Solid Waste Management District

1. Act 148 Universal Recycling Law bans from landfills:

- **Mandated Recyclables** - aluminum & steel cans; aluminum foil & pie pans; glass bottles & jars; PTE (#1) & HDPE (#2) plastic bottles & jugs; corrugated cardboard; white & mixed paper; newspaper; magazines; catalogues; paper mail & envelopes; box board; paper bags
 - Must be collected at facilities starting July 1, 2014
 - Must be collected at curbside by haulers starting July 1, 2015
 - Must be collected at curbside by municipalities starting July 1, 2015
 - Must be collected in public spaces (alongside trash containers) starting July 1, 2015 (public spaces are defined as “state, county, or municipal building, airport terminal, bus station, railroad station, school building, or school spaces, except in bathrooms)
 - Banned from landfill disposal starting July 1, 2015
 - **Leaf & yard debris & clean wood**, phased in as follows:
 - Transfer stations/Drop-off Facilities must accept leaf and yard debris including brown paper bags starting July 1, 2015
 - Haulers of trash must offer leaf and yard debris collection starting July 1, 2016
 - Leaf, yard, and clean wood debris are banned from the landfill starting July 1, 2016
 - **Food scraps**, phased in as follows:
 - Generators of 104 tons/year (2 tons/week) must separate food scraps starting July 1, 2014
 - Generators of 52 tons/year (1 ton/week) starting July 1, 2015
 - Generators of 26 tons/year (1/2 ton/week) starting July 1, 2016

- Generators of 18 tons/year (1/3 ton/week) starting July 1, 2017
- Transfer stations/Drop-off Facilities must accept food scraps starting July 1, 2017
- Haulers of trash must offer food scrap collection starting July 1, 2017
- July 1, 2020 all food scraps are banned from the landfill
- "Fine Print": any business or institution which is located within 20 miles of a certified facility **with existing capacity and a willingness to accept the material**, must separate food scraps and have a management plan for them

What are the benefits of the Universal Recycling Law? (from the Vermont ANR website)

- Significantly increases Vermont's recycling rate (from current rate of ~36% to a goal of 50%), conserving raw materials and reducing energy use
- Stimulates economic growth and creates jobs
- Lowers Vermont's greenhouse gas emissions (estimated 38% improvement)
- Conserves existing landfill space and reduces the need for more landfills
- Standardizes and streamlines solid waste management and requirements statewide
- Supports the local food system and fosters stronger community connections

The Committee has no idea how the ANR anticipates enforcement of Act 148.

2. Act 58 Paint Product Stewardship Law begins July 1, 2014

- Free paint recycling/disposal at paint retailers, recycling centers, hazardous waste facilities & collection events
- Transportation/recycling/disposal costs will be paid via a fee at the point of purchase or borne by manufacturers

3. Universal Waste (source: Vermont's Universal Waste Fact Sheet – Appendix 1)

Universal wastes are wastes that meet hazardous waste criteria but, because they pose a relatively low-risk compared to other hazardous wastes and are generated by a wide variety and large number of businesses, are exempt from regulation as hazardous waste.

Although universal wastes are exempt from the hazardous waste regulations of Subchapters 1 through 7 of the Vermont Hazardous Waste Management Regulations (VHWMR), they still must be managed according to the Subchapter 9 Universal Waste Management Standards.

Wastes that can be managed as universal waste in Vermont include: batteries, certain pesticides, mercury thermostats, PCB-containing fluorescent light ballasts, lamps (e.g., fluorescent bulbs), mercury-containing devices (e.g., mercury switches), and cathode ray tubes (e.g., color computer monitors and TV screens).

4. Senate Bill 208 (excerpted from VTDigger.org website)

- The total cost of implementing Act 148 is estimated at \$45 million, according to a legislative report by the environmental consulting firm DSM Environmental Services.

- The Senate had proposed increasing the state’s franchise fee placed each ton of trash brought to a transfer station from \$6 to \$7. The fee has not changed since the 1980s. The House removed the fee until the cost of the current program is better understood.
- ANR is to set up a working group this summer to study the state’s solid waste infrastructure needs, costs of the programs and a plan on how to dispose of architectural waste – drywall, metal, asphalt shingles, clean wood, plywood, and oriented strand board

5. Waste/recycling/composting issues

- Strong evidence exists that elimination of curbside recycling collection will dramatically decrease household participation in recycling efforts. Hartford could choose to continue this program and then residents hiring private haulers would most likely not see an increase in their hauling fees. Since the town would be collecting recyclables haulers would not have to do it.
- It is likely that haulers will charge individual households \$6 - \$8/month more for curbside recycling as part of a solid waste hauling contract than the cost per household for a continuation of the municipal contract
- The forecasted regional waste stream makes operation of a landfill at the GUVSWD permitted site uneconomical for the next several years. However, it provides an excellent “back stop” to the existing Lebanon landfill, which will certainly need to close sometime in the more distant future. (DSM: 2030 – 2080)
- The GUVSWD site might be an excellent location for a regional composting facility.
- MSW collection options that could be considered:
 - Municipal operation
 - Regional collaborative operation
 - Town contract with Casella or another hauler
 - Town franchise with Casella or another hauler, with either residents paying the hauler for monthly service or residents pay via a “pay as you throw” (purchased bags or stickers)
 - NRRRA may be a resource in helping the town negotiate with potential haulers

6. GUVSWD membership

- They are eager to have us and willing to make deals.
- Issues requiring resolution:
 - The cost of 3 previous GUVSWD bonds
 - Vote proportionality
 - What are the advantages to Hartford? Some degree of control once the landfill opens.

7. Transfer Station operations

- Anticipated future participation/usage levels
- Changes in operating hours/expenses
- Financial risks
 - Lebanon discontinues acceptance of ground C&D

- Needed repairs/capital expenditures
- Regional HHW facility
 - Level of investment needed
 - Annual operating expenses
- Turn the transfer station over to GUVSWD?

8. Regional cooperation/coordination

- Regional pickup
- Pros: reduces potential vulnerability to a Casella “monopoly”, greater control of recyclable products
- Cons: managing multiple municipal agendas/priorities, financial exposure, steep learning curve, building infrastructure
- Division of the waste stream
 - HHW (possibly Hartford’s role)
 - Recyclables
 - Organics (GUVSWD landfill site?)
 - MSW
 - C&D

4.2 Appendix II: Opportunities for Regional Cooperation on Solid Waste Management in the Upper Connecticut River Valley – Final Report July 2014 – DSM

Prepared for:

Greater Upper Valley Solid Waste District

Town of Hanover, NH

Town of Hartford, VT

City of Lebanon, NH

Town of Norwich, VT

Opportunities for Regional Cooperation on Solid Waste Management in the Upper Connecticut River Valley

FINAL REPORT – JULY 2014

Prepared by:

DSM ENVIRONMENTAL

Opportunities for Regional Cooperation On Solid Waste Management In the Upper Connecticut River Valley

Table of Contents

INTRODUCTION	1
SCOPE OF WORK.....	3
Limitations of Analysis.....	4
METHODOLOGY AND RESULTS.....	5
Analysis of Lebanon Landfill Scale Data	5
The Role of Transfer Stations	6
Source of Waste and Collection Method	7
Review of Construction and Demolition Waste Management.....	9
Materials Recycling.....	10
Household Hazardous Waste (HHW) Management.....	12
Organics Diversion.....	14
Costs of Solid Waste Management	16
Increasing Materials Diversion from Disposal.....	17
FINDINGS AND CONCLUSIONS.....	20
Regional Cooperation.....	25
Acknowledgements	28

INTRODUCTION

For decades communities in the Upper Valley have cooperated on solid waste management, even though solid waste regulations and planning requirements differ in the two states. Ten Upper Valley municipalities in Vermont are members of the Greater Upper Valley Solid Waste Management District (GUVSWD), and municipalities to the south of Lebanon on the New Hampshire side were members of the Sullivan County Regional Refuse Disposal District and the NH/VT Solid Waste Project for over twenty years before it was disbanded. More importantly, the City of Lebanon landfill has served communities in both states for many years, providing cost effective landfill disposal while providing the host community of Lebanon with up to \$600,000 annually in revenue for the general fund over and above the cost to operate the landfill.

The adoption of Act 148 in Vermont, which significantly ratchets up mandatory materials and organics recycling requirements for Vermont communities, combined with a desire by municipalities in both states to save costs through regionalization of shared services prompted the larger communities of Lebanon, Hanover, Hartford and Norwich, together with the GUVSWD to contract with DSM Environmental Services, Inc. (DSM) to examine the potential for cost savings and increased materials diversion through greater regional cooperation. One of the driving forces behind the analysis was the realization that eventually Lebanon's landfill will either reach capacity or be required to invest in more costly cell construction to the south of the existing landfill. The GUVSWD, which owns a permitted landfill site in Hartland, has financed the development of that site and would be interested in sharing those costs with additional communities in return for joint ownership of this potentially valuable resource in the future. And, the Town of Hartford has the only permitted permanent household hazardous waste (HHW) collection facility which could be operated as a regional facility serving all of the municipalities using the Lebanon landfill.

DSM Environmental Services, Inc. (DSM) was contracted by the towns of Hanover, Hartford, and Norwich, the City of Lebanon and the GUVSWD to conduct a regional analysis of solid waste collection, disposal and recycling activity. The objective was to not only provide a better understanding of the wasteshed and the potential for additional diversion, but to review how municipalities on both sides of the river might share resources and jointly finance solid waste management activity in the future, including the GUVSWD landfill site.

Municipalities included in the analysis comprise all of the municipalities that are currently delivering waste to the Lebanon landfill. Table 1 lists the municipalities and their population and provides an estimate of the total number of households (adjusted for the seasonal population) which make up the study region.

TABLE 1: POPULATION AND ADJUSTED HOUSEHOLD COUNT⁽¹⁾ FOR MUNICIPALITIES IN THE STUDY REGION (2012)

VERMONT	Population	Housing Units	Households Occupied	Household Count, Including Seasonal Households
Bridgewater	936	688	431	495
Hartland	3,393	1,584	1,417	1,459
Norwich	3,414	1,553	1,386	1,428
Pomfret	904	544	393	431
Sharon	1,502	735	621	650
Strafford	1,098	586	453	486
Thetford	2,588	1,288	1,097	1,145
Vershire	730	435	300	334
West Fairlee	652	368	275	298
Woodstock	3,048	1,893	1,392	1,517
Subtotal, GUVSWD:	18,265	9,674	7,765	8,242
Fairlee	977	625	429	478
Hartford	9,952	5,816	4,446	4,789
Total, Vermont:	28,217	15,490	12,211	13,031
NEW HAMPSHIRE				
Canaan	3,909	1,930	1,588	1,674
Enfield	4,582	2,508	2,044	2,160
Grafton	1,340	839	564	633
Grantham	2,985	1,773	1,249	1,380
Hanover	11,260	3,445	3,119	3,201
Lebanon	13,151	6,649	6,186	6,302
Lyme	1,716	810	705	731
Newbury	2,072	1,559	869	1,042
Orange	311	167	132	141
Orford	1,237	656	535	565
Plainfield	2,364	984	923	938
Sutton	1,837	985	757	814
Total New Hampshire:	46,764	22,305	18,671	19,580
Total Region:	74,981	37,795	30,882	32,610

(1) Unoccupied housing units are assumed to be occupied 25% of the year, to account for the seasonal population.

SCOPE OF WORK

DSM was contracted in November 2013 to undertake the following scope of work:

- Develop rough estimates of the amount of MSW, Recyclables, HHW, C&D, Organics, Electronics, Tires, and other special wastes generated in the study area based on information supplied by the municipalities, as well as per capita estimates where real data are not available, with adjustment to account for industrial, commercial and institutional (ICI) waste and materials.
- Examine the refuse and recycling collection infrastructure in the region and estimate the percentage of the population that relies on curbside versus drop-off collection, considering the existing municipal contracts in place.
- Look at existing (and potential) facilities located in the participating municipalities and the type and volumes of materials handled by each.
- Make rough estimates of the current capacity of the existing infrastructure to handle these materials, and the potential to handle materials moving forward. This includes consideration of current costs (as provided by municipalities), and potential future costs given changes associated with Act 148 in Vermont, and similar changes that might occur in NH over time.
- Assess any regional opportunities for materials collection, management, transfer and disposal; including consolidation or sharing of facilities. This includes examining the potential for regional governance and the distribution of costs to participants, as well as how the Lebanon landfill lifetime might change with changing disposal rates, and the potential future for the GUVSWD District landfill.

In order to accomplish this Scope of Work, DSM carried out the following tasks:

- Reviewed transfer stations reports required by the NH Department of Environmental Services (DES) and VT Agency of Natural Resources (ANR) on materials collected for recycling and disposal at municipal transfer stations, including volumes and markets by material type;
- Surveyed municipalities on the facilities and services available for solid waste management in their municipality, and collected additional data on the use of those facilities and services, and the types and volumes of materials handled;
- Collected and analyzed information on the flow of municipal solid waste (MSW) in the study region including data on MSW and construction and demolition waste (C&D) compiled by GUVSWD, scale data detailing CY 2013 deliveries to the Lebanon landfill, and MSW and C&D deliveries to other disposal facilities;
- Reviewed current tipping fees and the potential to increase tip fees at the Lebanon landfill;
- Surveyed area haulers on services provided and the percentage of waste and recycling collected from households as opposed to businesses and institutions;
- Reviewed municipal curbside collection contract costs and services provided;

- Evaluated the current HHW collection system in VT and in NH in calendar year (CY) 2013;
- Evaluated current recycling activity and the potential to increase recycling;
- Collected data on food waste composting activity, facilities used, and volumes generated by different institutions;
- Reviewed the potential to increase diversion of recyclable materials and organics;
- Evaluated the impact of these decreased deliveries on the Lebanon landfill;
- Reviewed the potential to share services regionally, and the potential benefits of regional arrangements; and,
- Developed a description of the potential institutional and regional funding options that might exist if regional sharing of facilities was deemed cost effective.

The findings of DSM's work are presented below

Limitations of Analysis

DSM has relied on data provided by the municipality or listed in a mandated facility report for each operating facility. However, in many cases, municipalities had limited data on quantities of wastes collected by material type requiring DSM to use best professional judgment to estimate materials quantities. DSM endeavored to locate missing data by contacting organizations that handled materials collected, such as Northeast Resource Recovery Association (NRRRA) which cooperatively markets materials from some of the study municipalities, or other material and organics recyclers operating in the region.

The City of Lebanon did provide DSM with detailed data on deliveries to the Lebanon landfill which were used in this analysis. However, according to the scale operator Lebanon sometimes relies on statements by drivers entering the landfill as to the location of collected waste, which may or may not be entirely accurate.

Data available to DSM beyond that provided by Lebanon on landfill deliveries are for the most part estimates, with scale data not available for much of the estimates on recycling and on MSW and C&D disposed outside of the Lebanon landfill.

In addition, and most critically, through this analysis DSM found that over 70 percent of MSW, recyclables and C&D are collected by the private sector and as result there was no central source of data on materials collection by municipality outside of that reported by transfer stations. DSM was highly reliant on the largest waste collection company in the region, Casella Waste Services, to provide information and verify data in order to complete the analysis of material flow in the region. DSM also conducted surveys of other private haulers, and relies on these responses to draw any conclusions.

METHODOLOGY AND RESULTS

Analysis of Lebanon Landfill Scale Data

The City of Lebanon provided landfill scale data for 2010 – 2013 for each of the municipalities utilizing the landfill. The scale data lists the hauler or permit holder name, date, time, weight, material type and source (originating municipality) for each weight taken. DSM analyzed this information in detail for calendar year (CY) 2013 to calculate the quantities collected from each hauling company and from each municipality.

While the scale operator has the ability to 'split tickets' when trucks are delivering MSW collected from more than one municipality to the landfill, in practice this rarely occurs. It is up to the driver to ask for a split ticket and any 'split ticket' data would represent the driver's estimate as to the weight and origin of trash collection as the trucks do not have on-board scales. Finally, there is no reason for the driver or waste company to track which municipality the waste is collected in except when reporting tonnages to the Greater Upper Valley Solid Waste District. Therefore, the municipal scale data provides only a rough estimate of the quantities of waste by municipality.

DSM also surveyed the landfill operators to more accurately allocate deliveries from users paying with coupons. However, it is likely that some coupon users claim they are from Lebanon when they purchase coupons, even if they are not, which inflate totals originating in Lebanon.

Key findings from the analysis of the Lebanon landfill scale data include:

- Roughly 38,000 tons were delivered to the Lebanon landfill last year. Another 3,000 tons from municipalities that could deliver waste to Lebanon went to other facilities; it is not likely that this waste will be delivered to Lebanon going forward given current tipping fees at surrounding facilities;
- Roughly 95% of the total MSW tipped from NH municipalities is delivered by 20 private haulers who make up only 9% of permit holders from NH;
- Roughly 96% of the total MSW tipped from VT municipalities is delivered by 12 private haulers who make up only 14% of permit holders from VT;
- Casella represents roughly 60% of the MSW disposed at the Lebanon landfill, and with the purchase of Woodstock Recycling, would represent 63%;
- The remaining MSW is delivered from other private haulers (13%), municipal transfer stations including Lebanon's drop-off at the landfill (14%), and businesses and institutions that direct haul their waste (10%, of which 1665 tons were from Dartmouth College); and,
- A large number of businesses in Lebanon, especially, deliver waste directly to the landfill, as opposed to contracting with a private hauler – while these deliveries represent a relatively small percentage of total deliveries they comprise a large percentage of the traffic delivering waste;

As the findings above indicate, Casella is the key to deliveries of waste to the Lebanon landfill. Casella is under no obligation to deliver waste to Lebanon, and a decision by Casella to stop using the Lebanon landfill would have a significant impact of Lebanon landfill revenues.

The Role of Transfer Stations

According to George Murray, City of Lebanon, all municipalities using the Lebanon landfill have a signed agreement with Lebanon which, among other clauses, requires that *“the Town shall have the obligation to deliver all Acceptable Waste which the Town controls to the (Lebanon) Landfill”*.¹

DSM obtained 2012 transfer station reports from the New Hampshire Department of Environmental Services for municipal transfer stations located in Lyme, Sutton, Canaan, Enfield, Newbury, Grantham and Grafton. These reports list tonnages of MSW, recyclables and Construction and Demolition (C&D) Waste collected during each calendar year and the destination for these materials. However in some cases, DSM needed to confirm the destination and quantities of materials as information was incomplete.

In Vermont, DSM obtained copies of quarterly reports for the transfer stations and drop-offs, and/or collected data on materials collected, weights and destinations directly from the municipality.

DSM’s key findings from reviewing these reports include:

- Some transfer stations serve as an important outlet for hard to handle wastes, such as propane tanks, tires, lead acid batteries, bulky and C&D wastes, scrap metal, and florescent tubes;
- Roughly 30% of residential MSW is collected through transfer stations;
- Transfer stations collected an estimated 36 percent of residential recyclables in the region;
- Recycling rates at transfer stations appear relatively high, and when coupled with unit based pricing result in the highest rates of recycling however, these rates do not represent the recycling rate for a municipality as a whole since not all residents use the transfer station and some do to only recycle or drop-off special wastes; and,
- Costs to collect materials at a transfer station are not necessarily lower than the cost to collect materials curbside, particularly if the cost to the resident to drive to the transfer station is included.

¹ Language from *“Municipal Solid Waste Agreement between City of Lebanon and Greater Upper Valley Solid Waste District, June 1, 2000*. It is assumed that all VT and NH municipalities using the Lebanon landfill have entered into the same agreement.

Source of Waste and Collection Method

DSM contacted town administrators, transfer station operators and private haulers to determine who collected MSW in the municipality, where MSW went if it didn't all go to the Lebanon landfill and how much, and roughly how much MSW was generated by residents as opposed to the commercial/industrial/institutional (ICI) sector.

This information was used in conjunction with the Lebanon landfill scale data and the municipal transfer station data to allocate tonnages collected to either residential or ICI generators, and by municipality.

The results from this analysis are shown in Tables 2 and 3 below. As noted above, roughly 38,000 tons was delivered to the Lebanon landfill with the remainder going to other transfer stations or landfills.

TABLE 2. ESTIMATED TONS OF MSW GENERATED BY VERMONT AND NEW HAMPSHIRE MUNICIPALITIES USING THE LEBANON LANDFILL

	Residential	ICI	Total	Percent
State	<i>(tons)</i>	<i>(tons)</i>	<i>(tons)</i>	<i>(%)</i>
Vermont	9,300	4,400	13,700	33%
New Hampshire	15,900	11,700	27,600	67%
Total:	25,200	16,100	41,300	

TABLE 3: ESTIMATED TONS OF MSW DISPOSED BY COLLECTION METHOD AND BY GENERATOR TYPE

	Residential	ICI	Total	Percent
Collection Method	<i>(tons)</i>	<i>(tons)</i>	<i>(tons)</i>	<i>(%)</i>
Private Hauler	17,400	12,300	29,700	72%
Property Manager	300		300	1%
Business/Institution Direct Haul		3,600	3,600	9%
Transfer Station	7,500	200	7,700	19%
Total:	25,200	16,100	41,300	

Figures 1 and 2 illustrate the contributions of MSW from each municipality in the study area to the Lebanon landfill wasteshed. These include both residential and ICI waste disposal from each municipality.

FIGURE 1. ESTIMATED MSW DISPOSAL IN CY 2013 BY NH TOWNS

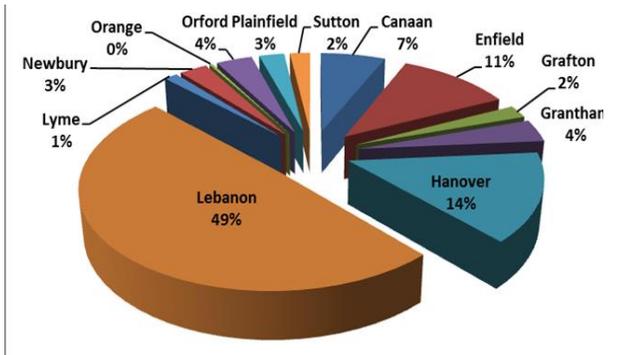
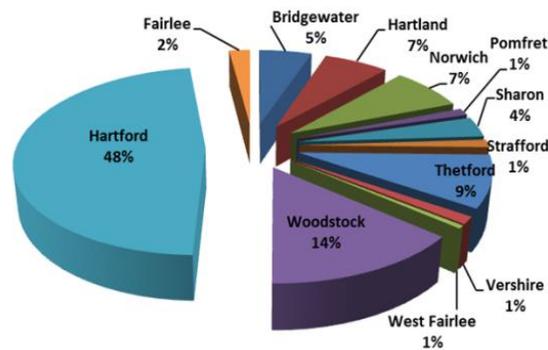
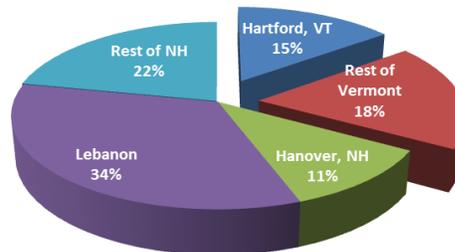


FIGURE 2. ESTIMATED MSW DISPOSAL IN CY 2013 BY VT TOWNS



Finally, Figure 3 illustrates the largest contributors to the wasteshed in the study region. Collectively, an estimated 24,700 tons of waste were delivered from generators in Hanover, Hartford, and Lebanon last year, or about 60 percent of waste disposed from the study region.

FIGURE 3. LARGEST CONTRIBUTORS TO DISPOSAL FROM THE STUDY REGION (CY 2013, BY WEIGHT)



DSM’s key findings from this analysis are:

- Over 70 percent of the MSW is collected by private haulers and not by municipalities;
- Transfer stations are responsible for 19 percent of this MSW collected in the region;
- Many small businesses haul their own waste directly to the Lebanon landfill, typically in small loads paying the same tip fee as larger haulers delivering much larger loads;
- Most of the waste from Vermont is residential; and,
- Vermont’s contribution to the wasteshed is relatively small at an estimated 13,700 tons disposed last year, or 1/3 of disposal in the region.

Review of Construction and Demolition Waste Management

Most C&D waste is not delivered to the Hartford transfer station or the Lebanon landfill. Instead it goes to Casella transfer stations in Lebanon or Newport; or a small amount goes to Hammond Grinding and Recycling in Orange, NH.

Based on DSM's limited survey, an estimated 13,000 tons of C&D waste were generated last year from the study area, of which only roughly 1,000 tons was delivered to the Hartford transfer station or the Lebanon landfill. Generation of C&D waste is likely up from the past few years when construction and demolition activity was down, and therefore associated C&D waste generated at low levels. C&D waste composition varies greatly depending on the type of construction (and demolition) activity that occurs in the region. For example, new home starts generate more clean wood and gypsum than renovation or demolition activity. Because of this, it is difficult to predict how much material might be available for recycling in a given region. However, based on a comprehensive analysis that DSM conducted for Massachusetts Department of Environmental Protection in 2007,² only about 11 percent of C&D waste is composed of clean wood (or high grade wood, consisting of pallets and crates and other unpainted wood), and another 6 percent is clean dry wall. In both cases, separating the clean wood and gypsum after it has been combined with other C&D materials is difficult (for clean wood) and nearly impossible for clean gypsum (because it is broken into small pieces). As such recycling activity for these materials must take place at the job site, or at the entrance to disposal/transfer facility.

There is very little information available on the volume of C&D recycling activity occurring in the region. Reuse outlets like *Cover* and *Vermont Salvage* play a role in the recovery of useable building components, and large demolition contractors that work directly with C&D processors/recyclers can help to divert C&D materials in the region from disposal. In most cases, C&D recyclers sort C&D materials manually and mechanically, and sell the majority of wood waste for fuel, while recovering large pieces of cardboard and metal.

The economics of hand separating materials at a transfer station typically do not justify the cost of sorting. Source separation of clean wood with consolidation at a transfer station or landfill can be economical. However, given how little C&D waste is being disposed of at municipal facilities, it does not appear that there are significant regional opportunities for managing this material.

More importantly, grinding of C&D at Hartford with free disposal of the ground C&D at the Lebanon landfill may prove problematic going forward as Lebanon works to control odors at the landfill. This is because disposal of whole C&D mixed with MSW typically generates less odor than grinding and use of the C&D as landfill cover material.

² <http://www.mass.gov/eea/docs/dep/recycle/reduce/06-thru-1/07cdstdy.doc>

Materials Recycling

DSM collected data on recycling activity occurring in the study region. This included collection and review of state facility reports and telephone surveys of major recyclers and transfer station operators. DSM did not survey large generators that handle their own material, such as grocery, department and large retail stores that may bale on-site and backhaul materials. As such, these materials are not included in our estimates of recycling in the region.

As part of the telephone surveys, DSM asked handlers to estimate how much material was collected from households as opposed to businesses and institutions, and how much material came from Vermont locations as opposed to those in New Hampshire.

The focus of DSM’s analysis was on the recycling of printed paper and packaging materials, including bottles and cans. Scrap metals, textiles and other types of materials were not well documented beyond any reporting by transfer stations. A summary of DSM’s findings are shown below in Table 4. Please note that the allocation of recycling to the residential and commercial sectors, and to Vermont as opposed to New Hampshire relies heavily on estimates made by the largest handlers of recyclables. Note that ICI refers to the Institutional, Commercial and Industrial sector combined and includes the hospitals and Dartmouth College.

TABLE 4: ESTIMATED RECYCLING QUANTITIES BY SECTOR, SOURCE AND STATE (CY 2013)

	Residential	ICI	Total	Percentage
Source	<i>(tons)</i>	<i>(tons)</i>	<i>(tons)</i>	<i>(%)</i>
Recycling - VT				
Drop-offs	1,300	140	1,440	12%
Curbside	1,550	1,900	3,450	29%
Leb Landfill	80	0	80	1%
Recycling - NH				
Drop-offs	500	50	550	5%
Curbside	1,900	3,600	5,500	46%
Leb Landfill	920	80	1,000	8%
Recycling - Total				
Drop-offs	1,800	190	1,990	17%
Curbside	3,450	5,500	8,950	74%
Leb Landfill	1,000	80	1,080	9%
Total Recycling:	6,250	5,770	12,020	

Key findings from DSM’s analysis include:

- An estimated 6,250 tons of printed paper, packaging and containers were recycled from households in the study region last year;
- Of this amount, Vermont’s households were estimated to have recycled an average of 430 lbs. last year and NH households an average of 340 lbs. per household;
- Transfer stations and drop-offs, including the Lebanon landfill’s drop-off area, contributed roughly 26% to the recycling estimate;
- An estimated 45 percent of residential recycling occurred through transfer stations and drop-offs (including the Lebanon landfill), even though 69 percent of refuse is collected by private haulers – this indicates that many households do not have access to parallel collection of recyclables and refuse and must rely on driving to a transfer station to recycle; and,
- The majority of commercial recycling occurs in NH and this figure is underestimated as it excludes many large generators of old corrugated containers and other packaging such as grocers and large retailers.

While recycling rates are a notoriously poor way to compare the progress or success of recycling/diversion programs, they continue to be a standard method of measurement. Table 5 below presents estimated recycling rates for printed paper and packaging (including containers) only, and excludes Vermont bottle bill material. If the bottle bill material were included, Vermont’s rate would be even higher.

TABLE 5. RECYCLING RATES FOR THE RESIDENTIAL AND ICI SECTORS

Source	Residential (tons)	ICI (tons)
Vermont		
Recycling	2,930	2,040
Disposal	9,344	4,407
Rate:	24%	32%
New Hampshire		
Recycling	3,320	3,730
Disposal	15,878	11,735
Rate:	17%	24%
Total Study Region		
Recycling	6,250	5,770
Disposal	25,222	16,142
Rate:	20%	26%

Household Hazardous Waste (HHW) Management

There are three different organizations currently managing HHW collections in the Study Region - the GUVSWD in Vermont, the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) in New Hampshire, and at a much smaller scale, the Town of Canaan.

The collection programs run by the two regional organizations are similar – each host a series of one day collections in the warmer months at transfer stations or other municipal locations to enable residents from the region to drop off HHW. In Vermont, Hartford has access to the GUVSWD collections, as one is typically offered each year at the Hartford transfer station at the location of the constructed but unused Hartford HHW facility. In addition, some municipalities periodically host their own collections for their residents.

Depending on funding available, HHW collections hosted by UVLSRPC are offered 4 to 5 times per year between the months of May – October. In Vermont, collections are less frequent and also depend on funding. Last year, there were two collections serving the Vermont towns.

Both the NH and VT collections rely on a permitted and licensed hazardous waste contractor to manage the collection site, ensure safety and compliance with state and federal law, and bulk, consolidate and label materials for shipment and further processing. These contractor costs represent a high percentage of the total program budget each year.

As part of a 2012-2013 Solid Waste Technical Assistance Grant funded by USDA, UVLSRPC studied the HHW collection program along with the universal waste collection programs, partnering with two Vermont Solid Waste Districts along the Connecticut River to look at HHW collection along the CT River Valley.

Conclusions from this study are summarized below³:

- *“Communities could do more to manage HHW at municipal transfer stations in New Hampshire.”*
- *“Towns could be managing all universal waste at local transfer stations/recycling centers. (For example, many towns in the region are not collecting antifreeze which could reduce cost by diverting this material from more expensive HHW collection.)”*
- *UVLSC could “benefit from partnering with nearby Vermont communities such as: Hartford and towns with the Greater Upper Valley Solid Waste District.”*
- *A rural rover program is not recommended for the region. However “Satellite collections” operated by trained professionals who set up in a small town and transfer the materials collected directly to a consolidation point are an alternative and seem to be the best option for the region.*

³ Connecticut River Valley Household Hazardous Waste Management 2013. November 15, 2013. Prepared by Morgan Environmental Solutions, LLC.

- *“Developing a permanent HHW collection facility could be a costly endeavor.”* The final report estimates annual costs of \$150,000 of which \$20,000 are estimated for disposal costs and \$11,000 for a bond payment on the capital costs for construction of a new facility (which were estimated at \$102,000).
- *“A permanent center would provide on-going options to residents and small businesses for properly managing the more dangerous wastes generated in the home or business. It would also provide storage for materials gathered that would not fit onto a truck after an HHW collection event.”*
- *“The UVLSRPC should work with the Town of Hartford, VT to utilize their existing collection center to be used by area residents and small businesses. A partnership with Hartford, VT would require some site improvements/repairs and a memorandum of understanding between the two parties.”*
- *“This partnership could increase access to proper HHW collection services and could reduce costs through sharing costs among towns.”*
- *“By establishing a permanent collection option and encouraging towns to collect all universal wastes, costs could be reduced and access increased.”*

The report also said the UVLSRPC study was to “provide the information needed to implement a long-term management program for HHW in its planning region and participating Vermont Solid Waste Districts.”

DSM reviewed the data available in this report and on the HHW collection programs in the study region. This included analyzing last year’s data on participation, quantities collected by material type, and program costs. DSM then compared these data with the Chittenden Solid Waste District (Williston, VT) program which is viewed as a model program in Vermont, as well as in many other states. Findings are summarized in Table 6.

TABLE 6: HHW COLLECTION PROGRAM COST, VOLUMES AND PARTICIPATION STATISTICS, AS COMPARED TO THE CSWD PROGRAM (1)

	NH	VT	CSWD
Gross Cost	\$43,431	\$30,778	\$472,218
<i>Quantity (lbs.)</i>	45,940	34,344	581,750
Participants	731	329	10,023
Households	731	329	9,290
Cost per Participant	\$59	\$94	\$47
Lbs/Participant	63	104	58
Total Households:	19,580	13,509	62,267
Participation Rate	4%	2%	15%

(1) Volume was converted to weight by applying commonly acceptable conversion factors for materials collected (such as paint and oil) and by interviewing the contractor to confirm the average density of invoiced materials.

As shown in Table 6, the CSWD had a participation rate of 15% of households in their District as opposed to participation rates of 2% to 4% in the Vermont and New Hampshire programs respectively. The cost per participant (typically a household or vehicle) ranged from \$47 in the CSWD to \$94 in VT. The quantity collected per participant also ranged broadly, with a high of 104 pounds for the Vermont collections to a low of 58 pounds in the CSWD. This difference in the weight delivered per participant typically plays a large role in the higher cost per participant since the majority of program costs are for disposal.

When comparing costs on a per pound collected basis, CSWD's costs are lowest at \$ 0.81 per pound with NH's program costs the highest at \$0.95 per pound and VT at \$0.90 per pound. However given the wide range in waste materials collected, the cost per pound varies, with highly toxic materials that must be lab packed typically at much higher costs than those of oil based paints, paint related wastes and other flammable wastes that might be bulked on-site.

In conclusion, if the Study Region were to follow the recent report conclusions and utilize the Hartford facility as a permanent facility, and offer satellite collection points to increase participation in the region, with a goal of achieving participation rates similar to the CSWD (at 15%), system costs would increase significantly over current costs. The cost per capita is misleading since lower costs are achieved with low participation and lower quantities per participant. At 15% participation in the Study Region (or 4,963 households) and at average quantities per participant of 58 pounds at a cost of \$0.81 per pound handled, the region would see annual costs of roughly \$234,000, compared to current annual costs of roughly \$74,000. This difference (roughly \$160,000) would have to be subsidized through a surcharge on landfill tip fees or through some form of per capita or per household charge. Grants may reduce this cost slightly, just as they offset program costs in both states currently, but would not cover most of the increased cost.

In conclusion, while there may strong interest in pursuing a broader and more permanent HHW program, it cannot happen without a significant subsidy. CSWD's HHW program has received a subsidy of over \$500,000 the past three years from the District's MSW tipping fee surcharge.

Organics Diversion

There has been interest and participation in food waste composting in the Study Region for over 15 years. Dartmouth College and the Town of Hanover were early supporters of the ROT composting facility located in Lebanon, and Dartmouth continues to use the facility to divert food waste and other organic materials.

DSM conducted a limited survey of food waste collection and off-site composting in the study region to determine who was separating food waste, how much material (roughly) was being diverted for off-site composting, and who was collecting and composting the material.

DSM also made rough estimates of how much food waste might be currently disposed in the region in order to estimate the potential for additional organics diversion above current activity. To do so, DSM used the recent

(2012) Vermont Waste Composition Study findings, and applied them to the estimated residential and commercial MSW tons disposed in the Study Area. The resulting estimates of food waste and other organics currently disposed are very rough, as the Vermont study presents results for Vermont as a whole, not for a particular region. But since there are no data on the composition of waste disposed in the Lebanon landfill, the Vermont study serves as a reasonable proxy to estimate organics diversion potential for the Study Region, as shown below in Table 7.

TABLE 7: ESTIMATED FOOD WASTE AND YARD WASTE DISPOSED IN THE STUDY AREA (CY 2013)

	Residential	Commercial	Total
	(tons)	(tons)	(tons)
Vermont			
Tons of MSW Disposed	9,025	4,726	13,751
<i>Food Waste</i>	1,509	531	2,040
<i>Mixed Yard Waste Leaves, Branches, & Stumps</i>	288	138	425
<i>Fines / Dirt</i>	253	118	371
<i>Other Organics</i>	486	42	528
New Hampshire			
Tons of MSW Disposed	16,011	11,735	27,746
<i>Food Waste</i>	2,677	1,319	3,996
<i>Mixed Yard Waste Leaves, Branches, & Stumps</i>	511	342	852
<i>Fines / Dirt</i>	449	293	743
<i>Other Organics</i>	861	105	967

From DSM’s telephone survey of food waste separation in the ICI sector, a total of 750 tons of food waste was estimated to be diverted off-site for composting from Dartmouth College, DHMC, APD Hospital, grocers and some restaurants and businesses in the region.

DSM’s findings include:

- Food waste is composted at three facilities in the region – the ROT facility (Lebanon), Acorn Hill Farm (Lyme) and Cookville Compost (Corinth);
- An estimated total of 750 Tons of food waste was diverted last year from institutions and businesses in the study region, including 650 tons from NH Facilities, 100 tons from VT establishments of which some were located in Bradford (which is outside the study region).
- If the estimates of commercial food waste disposed in NH were correct, the recovery rate for commercial food waste is already at 30%; and,
- Residential food waste disposal estimates (using the VT waste composition study) indicate backyard composting may already be in widespread use, particularly in Vermont.

Costs of Solid Waste Management

DSM developed rough estimates of the annual cost of solid waste management and recycling in the Study Region based on estimated unit costs from DSM’s database applied to quantities of material handled in the Study Region. Applying the estimated number of tons collected by the different collection methods used in the region (i.e. drop-offs and transfer stations, curbside collection and containerized collection) to an estimated per ton cost to collect yields a rough estimate of the total costs for each method in the region. These cost estimates are shown below in Table 8.

These costs assume tip fees of \$68.88 per ton, as charged at the Lebanon landfill last year, as well as transfer station operating costs (net of the disposal costs) of \$143 per ton for MSW and \$138 per ton for recyclables. Curbside costs applied were assumed to range from \$125 per ton for ICI refuse to a high of \$328 for residential curbside refuse.

TABLE 8: ESTIMATED SOLID WASTE MANAGEMENT COSTS IN THE STUDY REGION (CY 2013)

Service	Refuse (\$)	Recycling (\$)	Total (\$)
Residential			
Curbside Collection	\$5,805,000	\$715,000	\$6,520,000
Transfer Stations	\$1,075,000	\$338,000	\$1,413,000
Disposal (Tip Fee)	\$1,737,000	\$18,000	\$1,755,000
Subtotal:	\$8,617,000	\$1,071,000	\$9,688,000
Commercial			
Curbside Collection	\$1,993,000	\$854,000	\$2,847,000
Transfer Stations	\$28,000	\$49,000	\$77,000
Disposal (Tip Fee)	\$1,112,000		\$1,112,000
Subtotal:	\$3,133,000	\$903,000	\$4,036,000
Total Estimated Cost:	\$11,750,000	\$1,974,000	\$13,724,000

These cost estimates do not include the cost of HHW Collections (\$74,000, rounded last year), or the collection of some special wastes such as universal wastes, C&D waste, and tires. The cost estimates also exclude the cost to households and small businesses to deliver material to transfer stations, which could add roughly \$700,000 in additional costs per year if accounted for. The cost estimates do include the surcharge paid to the GUVSWD and to the City of Lebanon, which are built into the prices charged for collection and disposal.

Costs of existing food waste collection and composting off-site may add another \$200,000 or more to the system costs shown in Table 8.

The general conclusion is that solid waste and recycling collection, processing and disposal cost the Study Region roughly \$14 million, of which roughly \$10.9 million, or 79 percent (rounded) of total costs are spent on

collection. This illustrates the importance of managing collection costs to achieve efficiencies and control costs over time.

Given the importance of collection costs to total system costs the question has been raised by some municipal officials in the Study Region whether it would make sense to organize regional, public collection as a way to reduce total costs. While it is beyond the scope of this analysis to cost out a public collection system it is DSM's professional opinion, based on 30 years of observing private and public collection programs throughout the United States that in most, but not all cases, the private sector is more efficient than the public sector in the provision of collection services. There are exceptions (based on DSM's observations, Marion, Iowa and Fort Collins, Colorado are two municipal programs that are clearly competitive with private sector collection); but in general public sector programs often suffer from a lack of investment in the necessary maintenance and spare truck infrastructure, entrenched unions unwilling to make changes to increase efficiency, and public governing bodies unwilling to invest in new collection equipment on a timely basis.

This does not mean that individual municipalities in the Study Region should not consider organizing public collection if they believe that the private sector has become too monopolistic, and they have the existing public works fleet infrastructure in place; only that historically it has been difficult for the public sector to compete efficiently against the private sector for collection of MSW if there remains a competitive private sector willing to provide the service.

Increasing Materials Diversion from Disposal

Changes would need to be made in the organization of refuse and recycling collection to significantly increase recycling and food waste composting in the region. First, and foremost, municipalities that rely on subscription collection of refuse, but drop-off collection of recycling would need to require parallel collection of refuse and recycling to significantly increase materials diversion. This is especially the case for Lebanon where there is no organized curbside collection of recyclables even though the majority of residents subscribe for refuse collection.

Parallel collection will be required in Vermont by July, 2015, and simply means that all households receiving curbside collection of refuse must be offered curbside collection of recyclables with the cost embedded in the refuse collection cost.

DSM has surveyed household behavior in a number of municipalities around the United States where households receive curbside refuse collection, but must drive to a drop-off or transfer station to recycling. Only between 7 and 15 percent of households typically participate in recycling under this arrangement, compared to between 60 and 90 percent household participation when parallel curbside collection of refuse and recycling is provided.

The same parallel access for organics collection will eventually be required if the Study Region is to significantly increase the diversion of organic waste from households. While rural residential households can rely on backyard composting, most households with curbside refuse collection would need some type of separate food

waste collection service, which will be the case in Vermont under Act 148. This type of service will come at a higher cost than currently experienced because a second truck or new split truck would need to be utilized to separately collect food waste, and for some households, to add curbside recycling collection.

The only way to minimize additional costs would be to develop a uniform, consolidated service route for households. For example, Plainfield and Enfield are experiencing much lower per household costs for parallel refuse and recycling collection services than those who subscribe for curbside collection service because everyone in the Town has the same service and the hauler is able to develop efficient routes with a higher number of households served per route day than on a subscription route (where longer distances between stops are typical).

One way to reduce the added cost of organics collection would be a weekly food waste and organics (e.g. yard waste) collection, paired with every other week recycling (one week) and trash (the other week). This could be most efficiently achieved through use of a split truck, but could be achieved using multiple trucks at a higher cost.

Table 9 below illustrates the potential for additional diversion in the Study Region. These levels cannot occur without a significant commitment to the provision of parallel curbside collection or recycling and of food waste for all households.

TABLE 9: POTENTIAL FOR INCREASED DIVERSION OF RECYCLABLES AND FOOD WASTE, AND ASSOCIATED RECYCLING RATES (1)

	Residential	ICI	Total
Current	<i>(tons)</i>	<i>(tons)</i>	<i>(tons)</i>
MSW Disposal	25,200	16,100	41,300
MSW Recycling	6,250	5,770	12,020
Organics Collection		750	750
Subtotal, Diversion	6,250	6,520	12,770
Total Generation:	31,450	22,620	54,070
Recycling Rate:	20%	29%	24%
Additional Diversion:			
MSW Recycling	3,700	3,300	7,000
Organics Collection	3,000	1,100	4,100
Subtotal:	6,700	4,400	11,100
Total Projected Diversion	12,950	10,920	23,870
Remaining For Disposal	18,500	11,700	30,200
Total Generation:	31,450	22,620	54,070
Recycling Rate:	41%	48%	44%

(1) These estimates are based on an annual average weight of 600 lbs. per household recycled compared with the current estimated average of 382 lbs. in the study region. They also assume additional commercial recycling to a rate (for packaging and printed paper) of 40%, as well as additional residential and commercial organics diversion based on 60 percent recovery rate, minus the current off-site diversion.

As illustrated by Table 9, if the Study Region were to achieve best possible diversion rates an additional 11,100 tons of waste would move from disposal to materials or organics diversion, leaving roughly 27,000 tons potentially available for disposal at the Lebanon landfill. This estimate assumes no change in waste generation over time, which is not unreasonable given historic declines in deliveries of waste to the Lebanon landfill.

FINDINGS AND CONCLUSIONS

DSM performed this analysis of solid waste management and recycling activity in the Study Region with the objective of identifying opportunities for regional cooperation to increase diversion and/or reduce costs; including the potential for shared services for collection, recycling, organics management and HHW management.

DSM's findings and conclusions concerning **collection** in the region are as follows:

- The private sector is a key participant in solid waste collection in the region, currently collecting over 70 percent of MSW, with Casella dominating. Reducing collection costs and significantly increasing diversion may require managing collection through contracts or franchises.
- While it may be possible to organize collection across municipal (and state) lines, it is significantly easier for individual municipalities to organize collection through either a franchised arrangement or a municipal contract. The difference between a franchise and a municipal contract is typically that under a franchise one or more haulers have an exclusive license to operate in a municipality, while a municipal contract typically implies that the municipality contracts with one or more haulers to provide a specific collection service, with the municipality typically paying the contractor for the service.⁴
- Enfield represents a successful example of offering uniform, contracted curbside collection service to residents using small carts for MSW and large carts for single stream recycling at a relatively low cost per household.
- Plainfield also provides an example, with organized MSW and recycling collection, and the use of pay as you throw bags to raise some revenues to offset the costs of the contracted service to the Town.
- While Hanover and Hartford have organized recycling collection they do not have organized MSW collection, which may lead to lower quantities of materials recycled in these two Towns because not all households necessarily receive MSW collection on the same day as recycling collection.
- As recommended in DSM's 2012 report to Hartford, the logical option for Hartford would be to create a single franchise or contract for collection of MSW and recyclables using carts for both MSW and recyclables. Hartford could combine this with PAYT financing – either bags (as used in Plainfield) or billed by MSW cart size, which will be required under Act 148. Alternatively Hartford could simply allow the

⁴ There are municipal contracts where the private hauler is required to bill the households – Middlebury, Vermont is an example of this arrangement for recycling collection, however, typically this is more expensive because the private hauler must also bear the cost of non-payment, which typically might be roughly 5 percent of households.

private sector to implement the requirements of Act 148 with no role by the Town (and elimination of the curbside contract) but this will be more costly to residents⁵.

- If Hanover wants to move organics collection forward, organizing MSW collection to go with recycling collection would allow for eventual implementation of separate residential food waste collection.
- Lebanon has no organized collection, and no requirement for parallel collection of recyclables and refuse, as such it is likely that the recycling rate for Lebanon residents is significantly lower than it could be with more active involvement by the City of Lebanon.
- Smaller municipalities in VT can assume that private haulers will meet the requirements of Act 148
- Smaller municipalities in NH could organize collection as Enfield and Plainfield have, or continue with current system.

DSM's findings and conclusions on **materials processing** in the region are:

- There is an insufficient volume of recyclables in the region to justify investment in a modern Materials Recovery Facility – the industry trend is to develop large Single Stream processing facilities with long distance transfer of materials to these facilities. Casella represents this trend, with transfer capacity in White River Junction to transfer to either Casella's Rutland Single Stream MRF, or the Chittenden Solid Waste District's Single Stream facility in Williston, VT (operated by Casella).
- Casella's monopoly of Single Stream processing capacity in Vermont and New Hampshire has been raised by municipal officials as a concern going forward. However, the Chittenden District (not Casella) controls tipping fees and revenue sharing for the Williston (VT) facility, and there are competitive single stream MRF's owned by: Ecomaine in Portland, ME; Waste Management in Billerica and Springfield, MA; Willimantic Waste in Willimantic, CT; and, a Connecticut Resource Recovery Association facility in Hartford, CT operated by ReCommunity.
- Hartford's transfer station could be modified to transfer single stream materials collected in the Upper Valley to any of these single stream MRF's. Modification would require the provision for dumping into a 100 yard walking floor trailer. This typically requires a higher loading height, and the use of a front-loader to tamp down the load to achieve maximum over-the-road tonnage (averaging perhaps 18 tons per load)
- Lebanon could also be modified for regional transfer of single stream material, although because they currently bale and sell materials, they may find it cost effective to continue to do so;

⁵ DSM's analysis for Hartford in 2012, and a similar analysis for the Chittenden District indicates that organized, parallel collection using a single contract hauler could save roughly 15 percent over current systems costs using multiple subscription haulers.

- However, it is DSM's professional opinion that it is highly unlikely investment in new baling and sorting equipment at other facilities will be worth it, other than small OCC balers spotted at large generators such as grocery or big box stores (if they are not already there).

DSM's findings and conclusions on **organics processing** in the region are:

- Construction of a single compost facility to serve the region could cost as much as \$2 to \$3 million based on rough construction estimates DSM prepared for Vermont's Act 148 Analysis. This would involve construction of concrete pads, use of a cover material such as the Gore fabric, or a roofed building, aeration and grinding, turning and screening equipment.
- It is possible to construct a smaller facility with lower throughput for perhaps \$750,000 to \$1 million, assuming that it was designed primarily for yard wastes with some source separated food wastes low in contaminants. Such a facility would consist of gravel pads, a grinding machine, a front loader for construction and turning of uncovered windrows, and stationary screens for screening of finished compost. However, it should be cautioned that while the science of composting has been around for a very long time, there is a reason that there are as few successfully operating composting facilities as there are. The production of high quality compost without odor issues requires a significant investment in equipment to grind incoming materials and screen outgoing materials, as well as investment in trained operators to manage the composting and curing process. This investment increases significantly if the desire is to compost large quantities of food wastes in addition to yard wastes.
- Much of the "low hanging fruit" of organics appears to already be separately collected and brought to processing facilities in or adjacent to the Study Region. However, it is not clear that some of these facilities are adequately capitalized to provide long-term processing of organics.
- Based on DSM's Act 148 Analysis, it is estimated that residential collection of organics would cost an additional \$4 to \$8 per month per household. Costs at the lower end would depend on the availability of Single Stream collection of recyclables and every other week MSW collection. Single Stream collection is essential in order to co-collect organics and either recyclables or MSW. Dual or multiple stream recyclable collection is incompatible with split truck collection of organics.
- The costs to collect Institutional/Commercial/Industrial (ICI) organics are highly dependent on the individual business or institution, with larger generators of food waste experiencing lower costs per ton;
- In general, ICI collection costs will be more for organics collection than for MSW collection (perhaps \$75 per ton more) but tipping fees may be slightly lower (perhaps \$20 per ton), and the business or institution may save on MSW collection once heavy food waste is removed.
- As a result, only the larger generators would save money by having food waste collected separately.

DSM's findings and conclusions on **regionalization of disposal facilities** located in the study region are:

- There is currently excess disposal capacity in New England, with tip fees reported as low as low as the low 40's for Waste to Energy disposal in Massachusetts; and landfills in northern VT and NH offering disposal capacity in the low \$40's to low \$50's. Transfer of MSW and/or Single Stream recyclables can be accomplished for roughly \$15 to \$20 per ton, which means that the Lebanon landfill tipping fee of \$68.88 is roughly competitive with long distance transport. However, there is limited ability to raise Lebanon's tipping fee without risking the loss of waste.
- The Lebanon landfill's current business plan shows sufficient capacity through 2030 without need for more expensive expansion to south. The GUVSWD landfill site could provide capacity after that date. DSM is not aware of any analysis that compares the cost of expanding the Lebanon landfill south after 2030 with the alternative cost of developing the GUVSWD landfill. Such an analysis should be undertaken by the Study Region before making a decision as to which alternative is most cost effective.
- If the region as a whole (or with leading participation by the larger municipalities along with the GUVSWD) acquired the bond cost for the landfill, the GUVSWD could be freed up to serve more regional interests – including operating the Hartford TS and providing a permanent HHW collection site as well as a drop-off for other hard to handle materials and recyclables. This does not imply that the GUVSWD could necessarily operate the Hartford TS more efficiently than the Town of Hartford, only that the Town of Hartford is currently providing a regional service with any excess cost borne solely by the Town of Hartford.
- Regional acquisition of the GUVSWD site might involve the following:
 - The GUVSWD owes roughly \$2.6 million through three bond issues (house/office, Twin State land, Bridge) with one bond payment ending in 2014, a second in 2028, and the third in 2031.
 - Bond payments could be covered by a \$5 surcharge on current tonnage at Lebanon in 2015, falling to \$4 by 2024 (declining principal).
 - A lower surcharge might be achieved by stretching out payments but this course of action would require a regional bond vote which appears to be highly unlikely.
 - Potentially the most logical arrangement might be a capital lease finance which doesn't require a regional vote. This would require legal review for both Vermont and New Hampshire municipalities, with costs allocated by population or by potential tonnage deliveries.
- Other ways to raise the funds might involve:
 - More tons could be brought into the Lebanon landfill from Southern Windsor County such as from Weathersfield (who is paying \$79 per ton currently) or small haulers interested in an alternative disposal location, with the excess revenue (over costs) allocated to acquisition of the GUVSWD landfill site.

- A per household or per capita surcharge might be assessed on the entire population using the Lebanon landfill, which would equate to an estimated \$6.30 per HH in 2015 falling to \$4.50 in 2025 and \$1.30 by 2031.
- This surcharge would be less if it were assessed on all property (residential plus ICI) instead, which might be reasonable since the landfill serves the ICI sector as well as residents.
- Municipalities interested in acquiring the landfill could simply make payments using general fund revenues from property taxes.

DSM's findings and conclusions about the **Hartford Transfer Station (TS)**:

- The Hartford TS pays for itself (through the fees currently set) only as long as ground C&D can be delivered to Lebanon at no cost, If this arrangement changes, then (using 2011 cost data) the net annual cost to Hartford is an additional \$220,000 above the fees to users.
- If GUVSWD landfill debt (\$215,000 in 2015) were covered in some other way, labor and administration of the Hartford TS and the GUVSWD could be consolidated and paid for through the GUVSWD surcharge allowing the Hartford TS to be used for a permanent HHW collection site, and allowing all of the other activities currently provided to Hartford residents and residents of the GUVSWD towns to continue at no annual cost risk to Hartford taxpayers.
- If Hartford moves to parallel curbside collection of refuse and recycling, transfer station costs could be reduced by reducing hours of operation.

DSM's findings and conclusions regarding **HHW management** in the Study Region include:

- Participation in the current programs is relatively low at 2 to 4 percent last year. Increasing participation will increase costs, regardless of how efficient the new program may become.
- For example, the CSWD spends over \$3 per capita to support its' permanent program, which had 15% participation last year.
- Hartford's permanent facility could be updated and reopened to become a permanent collection location and the consolidation point for a regional system similar to CSWD. This might boost participation to close to 15% of households, depending on how many satellite collections were held throughout the region.
- However the cost of this type of program would be significantly greater than what is being spent now in the region (about \$74,000 last year). It is estimated that at minimum an additional \$160,000 per year would need to be spent to serve 15% of households even if program efficiencies were achieved.

- Raising this money would involve either assessing member municipalities, adding a surcharge on waste or looking for additional grants, which are typically not available beyond what grant monies are available now from State government.

DSM's findings and conclusions concerning **Construction & Demolition wastes and miscellaneous hard to handle wastes** are as follows:

- The vast majority of C&D wastes are being managed by the private sector and are not going through either the Hartford transfer station or the Lebanon landfill. There is no reason to believe that this will change in the near future.
- Only approximately 11.5 percent of C&D wastes are clean wood, with a potential market, and it is very difficult to separate out this clean wood once it is mixed with all other C&D waste. Therefore, any expanded efforts would require source separation by generators, or a concerted picking operation at the Hartford transfer station. However, given the relatively small volume of C&D waste going through the Hartford facility, it is not likely that this operation would be economical.
- Asphalt shingles are also potentially recyclable; however, as with clean wood they require source separation and close monitoring. It is DSM's observation that most asphalt shingles come in mixed with wood, metal and paper or plastic sheathing, all of which contaminate the asphalt shingles. It is not clear that the cost to closely monitor the stockpiling of asphalt shingles would be worth the cost to then transfer it to a facility in Portsmouth, NH currently accepting this material. However, it may be worth contacting Pike Paving about the potential to use asphalt shingles in their paving mix.
- Tires are another hard to handle waste generated in the Study Region. There are programs to collect tires for use in combustion facilities and/or for grinding and construction projects. The Lebanon landfill already acts as a consolidation point for the NRRRA program to collect tires in the Study Region. There is no reason why this can't continue to occur.

Regional Cooperation

The following institutional arrangements could be used to further regional cooperation, in order of potential difficulty:

- A Regional Refuse Disposal Agreement could be created on the NH side with an associated governing body to manage solid waste (for example the Sullivan County Regional Refuse Disposal District had broad powers to implement solid waste facilities), and Hartford could become a member of the Greater Upper Valley Solid Waste District, if the landfill and bridge debt could be addressed or set aside so that all municipalities belonged to a single district.
- An Interstate Compact then could be adopted allowing the two districts to jointly manage solid waste. However while the language may still exist on VT side, the ability to do this has been repealed on NH

side and will require the adoption of new NH legislation, and Congressional and US EPA approval. While this appears difficult, it may not be as hard as it sounds if the compact plans are not actively opposed and the benefits are significant enough.

- The Compact could proceed with joint financing of the acquisition of GUVSWD landfill site, the development of a single permanent HHW facility (either by buying or leasing Hartford's facility and updating it or by developing a new facility in Lebanon) for use by residents and small businesses of member municipalities, and with taking over the management and long-term closure commitments of the Lebanon landfill (which could be transferred to the users of the landfill). The Compact could also take over and manage the inter-municipal contracts made with the private sector for collection and processing of refuse, recyclables or organics.

However, as outlined above, while it is certainly possible to create a single regional entity to coordinate all of the potential solid waste and materials management tasks, it is not clear that there are sufficient benefits to endure the costs of moving this forward. Working within the framework of existing municipal governments could instead yield similar results at a much lower political cost.

For example, the following could be pursued without a regional entity in place:

- Capital lease financing of the GUVSWD landfill could occur, which would require legal review for NH and VT municipalities, and costs could be allocated by population, or by potential tonnage deliveries (which could be estimated annually).
- A more formal Lebanon landfill contract could be written for all municipalities specifying joint actions.
- New contracts could be put in place between member municipalities to implement joint facilities, projects or services (which would require legal review if they cross state lines).
- As part of this, unilateral action could be taken by municipalities to organize the collection of refuse, recyclables and/or organics with the goal of providing uniform service at lower costs. This could be done by contract or possibly by setting up a franchise(s).
- However, it must be recognized that private haulers currently collect roughly over 70% of the waste and recyclables in the region. Without some control over this collection, joint facilities or programs may or may not meet performance and financial goals.

In summary, it should be recognized that regional cooperation already exists on many solid waste management fronts. The Lebanon landfill is a de-facto regional facility, the GUVSWD already exists and owns a potential landfill site, and Hartford already shares its' transfer station and site with members of the GUVSWD.

Many of the activities necessary to improve diversion can occur unilaterally by municipalities, such as organization of curbside collection of waste and recycling and implementation of unit based pricing, which is probably the activity that would have the greatest impact on diversion.

However an important impediment to further regionalization is the debt service of GUVSWD landfill site, which has prevented the regionalization of the Hartford Transfer Station beyond the current sharing of this service.

Resolving the debt service issue will depend on the buy-in from the City of Lebanon, which currently may or may not recognize any value in acquiring a share in a future disposal site. Some of the ways in which this arrangement might create value for Lebanon include:

- Securing ultra-long term landfill capacity for the City as a backup to the existing site. It is probably safe to say that siting another landfill in the Upper Valley in the future would be exponentially more difficult than simply acquiring the permitted GUVSWD site.
- Avoiding the costs associated with expanding to the south.
- Potentially developing a way to avoid the risk of losing Casella and/or sufficient waste in the near term through the municipal arrangements made with the other municipalities (and therefore avoiding the risk of losing the General Fund revenue raised by landfill tip fees in the short term).
- Increasing the real estate value of buildings and land along Route 12 A.
- Providing additional capital and political support to help resolve odor issues and any other environmental issues that might arise in the future from the existing site.

Acknowledgements

DSM would like to acknowledge the following individuals and organizations that have provided information and data for this analysis.

George Murray, City of Lebanon

Vickie Davis, Upper Valley Lake Sunapee Council

Jim Toher, Casella Waste Management

Mike Sampson, Town of Canaan

John Hurd, Former GUVSWMD director.

Stephen Lambert, GUVSWMD administration

Carl M. Mitchell, Contractor to GUVSWMD

Neil Fulton, Town of Norwich

Peter Kulbacki, Town of Hanover.

Rich Menge, Town of Hartford

NH DES Solid Waste Management Staff

John Leigh, DHMC

John Godkin, Town of Sutton

Dennis Pavlicek, Town of Newbury

Andy McDonald, Town of Enfield

Steve Halleran, Town of Plainfield

Chris Scott, Town of Grantham

Gene Craft, Town of Vershire

Mike Durfor, NRRRA

Town Clerks for Bridgewater, Hartland, Fairlee, Sharon, Strafford, Thetford

4.3 Appendix III: Operations Review of Hartford's Transfer Station and Curbside Recycling Program – December 21, 2012 – DSM

December 21, 2012

Richard Menge
Public Works Director
Town of Hartford
173 Airport Rd.
White River Junction, VT 05001

Re: Operations Review of Hartford's Transfer Station and Curbside Recycling Program

Dear Rich:

Presented below is DSM's final report concerning our operations review of the Hartford Transfer Station and the Curbside Recycling Collection Program. We are hopeful that this analysis will be of use to Hartford as your solid waste management programs continue to evolve going forward.

Introduction

DSM Environmental Services, Inc. (DSM) was contracted by the Town of Hartford to undertake a comprehensive review of the Hartford transfer station operations and the curbside recycling collection program. This review was prompted by concerns that, while the transfer station was operating in the black under an enterprise account, punch card fees were high compared to neighboring transfer stations, and limited reserves were available to conduct necessary repairs and purchase of new equipment.

The curbside collection program, unlike the transfer station is funded entirely from the general fund and there were concerns as to whether the program was an essential service and/or was performing effectively.

This Letter Report summarizes the analyses undertaken by DSM and the resulting findings and recommendations. It is meant to augment the presentation provided to the Selectboard at its October 2nd meeting.

Tasks Undertaken

DSM, with assistance from the transfer station staff undertook the following tasks to complete our analysis:

- Analysis of transfer station use;
- Analysis of curbside recycling collection;
- Review of potential options through the Greater Upper Valley Solid Waste District and/or the City of Lebanon;
- Review of transfer station costs, by activity; and,
- Review of potential system changes.

Each task and the resulting findings is presented below.

Analysis of Transfer Station Use

Surveys of users of the transfer station were conducted by transfer station staff on the following dates:

- Partial days, Monday and Tuesday, June 4 – 5
- Full day, Saturday, June 9
- Full days, Thurs – Saturday, August 16 – 18
- Full days, Wed – Thursday, August 22 – 23

These surveys requested information on: what Town the user was from; what materials they were bringing, and how much of each they were bringing; how often they use the transfer station; and, whether they subscribed for curbside collection of refuse and/or took advantage of the curbside collection program for recyclables.

Surveys to only determine the Town which the user was from were also conducted on three additional days in late June.

Key Findings

- There are an average of 300 users on a Saturday and 95 users per week day
- Roughly 62% of Saturday users and 52% of weekday users are from Hartford
- The average Hartford resident comes to the transfer station every 2.3 weeks
- Based on answers to survey questions we estimate that roughly 1,000 residents of Hartford use the transfer station as their primary means of solid waste management
- This represents approximately 20% of full time resident Hartford households, or 16% of total households¹

While permit sales would indicate that between 30 and 37% of Hartford households purchase permits, the difference is likely households with curbside refuse collection that use the transfer station less frequently for special wastes. This assumption is consistent with Lebanon landfill scale data which indicates that a total of 8,840 tons of Hartford waste were delivered to the Lebanon landfill over the past year, of which only 1,900 tons came from the Hartford transfer station.

¹ Based on 4,509 full time households and an additional 984 seasonal/vacation households from 2010 Census data.

Hartford Residents Using Transfer Station

Looking *only at data from users who reported that they were residents of Hartford* the survey results indicate that:

- Between 40 and 65% (rounded) of Hartford users surveyed report using the curbside recycling service as well, and only about one-half of them brought recyclables to the transfer station on the day they were surveyed.
- Less than 10% of the Hartford resident Transfer Station users surveyed report having a contract with a private hauler for curbside collection of refuse indicating that the transfer station is the primary means for refuse disposal for these Hartford residents.

Cost To Hartford Resident Associated with Relying on Transfer Station

Based on the reported use of the Transfer Station by Hartford survey respondents it is possible to estimate what the total annual cost is to a Hartford user.

The average Hartford user visits the Transfer Station 26 times per year and purchases 46 coupon punches. The average annual cost can then be calculated as follows:

- Punch card: 46 punches at \$3.05 per punch = \$140
- Permit: \$20
- Cost to drive to the Transfer Station: assuming 6 miles per trip (a conservative assumption) and 26 trips yields 156 miles at 55.5 cents per mile = \$87
- Each households average share of property taxes to support curbside recycling program = \$25
- Total Cost: \$275 per year divided by 12 months = \$23 per month

Non-Hartford Residents Using Transfer Station

Looking *only at non-Hartford users* the surveys indicate that:

- The majority of non-Hartford residents using the transfer station are from Hartland, representing 25% of all users (including Hartford residents)
- The second largest non-Hartford user is from Woodstock, followed by smaller numbers from Sharon, Norwich, Pomfret, Thetford, and Stafford, in declining order
- A large majority of these non-Hartford users bring recyclables to the transfer station

- Performing the same cost analysis for the typical Hartland user but assuming the typical Hartland user comes to the Transfer Station 23 times per year and travels 10 miles out of their way, the total annual cost equals \$346, or \$28.85 per month.

Transfer Station Cost and Revenue Analysis

Total, fully allocated transfer station costs (exclusive of landfill closure costs) for FY 11-12 were \$658,874. This includes actual operations costs plus administrative costs assigned to the transfer station budget.

These costs are funded through a combination of tipping fees (coupon sales and tip fees) and other surcharges/fees (see Table 2, below), including:

- Annual permit fees of \$20 per vehicle for residential users
- Commercial hauler permits to use transfer station
- Waste ordinance fees for haulers operating in Hartford
- Rental revenue from Reuse Store
- Materials sales revenues from recycling
- Revenues over costs for C&D disposal

While Hartford allocates costs among activities at the transfer station as part of the enterprise fund accounting, DSM further broke down the activities to take a closer look at costs and revenues from key activities carried out at the transfer station. The goal was to attempt to determine what the net cost for each activity was, accounting for all costs and deducting revenues generated by that activity.

DSM used Hartford's Expenditure and Revenue report for FY 12, as provided to DSM by Andrew Larkin. DSM then relied on estimates by Hartford transfer station staff and Hartford administration as to what percent of time they spent on each activity over the course of an average month, as well as costs directly attributable to a single activity. This required that the Administration portion of the enterprise account (budget category 30-975) be reallocated to the curbside collection, MSW transfer, drop-off recycling, C&D and special waste activities shown in Table 1.

Table 1 summarizes fully allocated costs for FY 12 (based on end-of-year budget data) for the transfer station and curbside recycling collection.

As Table 1 illustrates, all of the operations at the transfer station except C&D grinding and the SEVCA lease are cost centers, even after deducting revenues. This is also the case for the curbside recycling collection system.

Excess costs over revenues are made up through other revenue sources, as illustrated in Table 2, which provides a summary of revenue sources supporting Hartford's transfer station and curbside collection

program. Note that revenues do not equal expenses when comparing Tables 1 and 2 because landfill closure costs are not included.

Table 1: Fully Allocated Transfer and Curbside Recycling Costs (FY 11-12)

Activity	Fully Allocated O&M	Capital Reserve	Total	Revenue	Net Cost	Cost/Ton
Curbside Collection	\$ 194,903	\$ -	\$ 194,903	\$ -	\$ 194,903	\$ 324.84
MSW Transfer	\$ 207,889	\$ 6,000	\$ 213,889	\$ 146,729	\$ 67,161	\$ 35.67
Drop-Off Recycling	\$ 165,893	\$ 6,000	\$ 171,893	\$ 48,436	\$ 123,457	\$ 146.05
C&D	\$ 188,206	\$ 6,000	\$ 194,206	\$ 308,208	\$ (114,002)	\$ (34.14)
Scrap Metal	\$ 58,293	\$ 1,168	\$ 59,461	\$ 49,084	\$ 10,377	\$ 55.06
SEVCA	\$ 3,358	\$ -	\$ 3,358	\$ 11,400	\$ (8,042)	na
Tires	\$ 3,935	\$ 1,000	\$ 4,935	\$ -	\$ 4,935	\$ 297.10
HHW	\$ 11,132	\$ -	\$ 11,132	\$ 6,845	\$ 4,287	na
Total (1)	\$ 833,609	\$ 20,168	\$ 853,777	\$ 570,701	\$ 283,076	
Transfer Station Only	\$ 638,706	\$ 658,874				

(1) Excludes Landfill Closure Cost of \$21,897

Capital Improvements

DSM's observation at the Transfer Station is that there is a need for increased investments in maintenance of both equipment and the buildings. While it was beyond our scope to develop engineering costs estimates, discussions with the Department of Public Works and transfer station personnel indicated that at a minimum the Town should increase capital reserves to include: \$25,000 for replacement of the fork lift with a newer piece of equipment; and, \$50,000 for site work upgrades to the HHW storage building so that it can become fully operable.

In addition, the Town should set aside funds each year for on-going maintenance of the existing buildings and for correction of on-going landfill settlement issues as they impact the access roads and entrances to buildings. These additional capital improvement costs are not included in Table 1 but represent real costs that the Town will need to address in future years.

Table 2, Summary of Revenue Sources (FY 11-12)

Category	(\$)
Permits	
Commercial	\$ 8,610
Residential	\$ 71,943
Tipping Fees	
Commercial	\$ 138,925
Hartford Coupon Sales	\$ 157,307
District Coupon Sales	\$ 136,150
Recycling Revenues	\$ 107,050
Reimbursements	\$ 27,514
Other Revenues	
SEVCA	\$ 11,150
Waste Ordinance Fees	\$ 80,000
Hauler Licenses	\$ 1,430
Transfer from General Fund	\$ 156,172
Total	\$ 896,251

Analysis of Curbside Recycling Collection

DSM’s analysis of Hartford’s curbside recycling collection system centered on three tasks. First, we met with Casella to review the current collection system and Casella’s estimate of the number of households served and estimated participation.

Second, DSM followed the curbside collection truck on representative routes over the part of several days attempting to gain a better understanding of likely participation rates.

Finally, Casella agreed to weigh all materials collected on the curbside collection routes over two weeks in August and two weeks in September.

Key findings of our analysis are:

- Roughly 600 tons of curbside recyclables are currently collected on an annual basis based on the four weeks of weigh data annualized
- Somewhere between 45 and 55 percent of Hartford households participate in the curbside recycling collection program

- Dividing the annualized tons by the total number of households in Hartford yields 270 pounds of recyclables per household per year
- We would expect that this would be approximately double if all Hartford residents had parallel collection of single stream recyclables in rolling carts on the same day as refuse collection (see below)

Alternatives Available to Hartford

DSM was also tasked with investigating alternatives to operating and/or keeping the Hartford Transfer Station open. We investigated three alternatives, in addition to continuation of the Transfer Station as it is currently operated: (1) operation of the transfer station by the Greater Upper Valley Solid Waste District; (2) Closure of the transfer station, directing all users to use the Lebanon landfill and/or contract with a private hauler; and, (3) operation of the transfer station on a limited basis with implementation of a town-wide contract for parallel collection of refuse and recyclables from all households. Each of these alternatives is discussed in more detail below.

Operation of the Transfer Station by the Greater Upper Valley Solid Waste District

DSM met with officials of the Greater Upper Valley to discuss the potential for the District taking over operation of the transfer station. This is a logical alternative given that the transfer station was designed as a regional facility and because roughly 45 percent of all users of the transfer station are from District towns outside of Hartford.

Unfortunately, while District officials acknowledge the regional value of the transfer station, it does not appear that the District is in a position to take over operations of the transfer station because of the significant amount of debt service the District is paying each year to fund the bridge construction to the District landfill site. Because the Lebanon landfill has adequate capacity for many more years (see below), there is limited need to open the District landfill, which would be the only source of revenue sufficient to support District operations of the Hartford transfer station.

However, there is general agreement that discussions between Hartford and the District, and potentially other Upper Valley municipalities should continue to determine if there is a regional solution that would allow the Hartford transfer station to remain as a key regional facility for managing waste and recyclables going forward.

Closure of Transfer Station with Use of Lebanon Landfill and Recycling Facility

There is currently no prohibition against Hartford residents and businesses delivering waste to the Lebanon landfill and recycling facility. In fact, most businesses and commercial haulers operating in Hartford deliver waste directly to the Lebanon landfill instead of to the Hartford transfer station because the tipping fee is significantly less. In addition, because Hartford's waste from the transfer station already goes to the Lebanon landfill, closing the Hartford transfer station would have no impact on the Lebanon landfill.

According to George Murray, Landfill Manager for Lebanon, the current Lebanon landfill cell under construction has sufficient capacity for an additional 12 years at current rates of fill (which includes Hartford waste). In addition, according to a new business plan for the Lebanon landfill prepared by Sanborn Head and Associates for the City of Lebanon, the landfill could remain in operation until 2090 by developing cell 3 to the south of the current operations, mining the original cell to the north of the current operations and filling that area and the road area between the two cells. This is based on the assumption of a one percent per year growth in the 40,000 tons currently disposed at Lebanon on an annual basis.

During discussion with Lebanon officials it became clear that the primary concerns associated with Hartford residents using the Lebanon landfill and recycling center revolve around traffic. Surveys of Hartford transfer station users indicate that almost as many people bring waste and recyclables to the Hartford transfer station on a Saturday as use the Lebanon landfill and recycling facility on a Saturday. Therefore, directing Hartford residents to use Lebanon would essentially double Saturday traffic to the Lebanon landfill. Even if the rebuilding of the 12A/I89 intersection were to solve the traffic problems on 12A, there would still be lines extending onto 12A from the landfill on Saturdays if both Hartford and Lebanon residents were using that facility. According to Lebanon officials, the traffic problem could only be solved if Lebanon were to stop its source separated recycling program and go to a single stream recycling program. This would eliminate some of the revenues Lebanon currently enjoys from their recycling system, requiring some type of increased fees for Hartford residents to make up the difference.

One key issue which may affect the Hartford transfer station is the current agreement by Lebanon to accept Hartford's ground C&D at no cost. This arrangement allows Hartford to bring in excess revenue over costs for the grinding and transfer operation. It is difficult to determine exactly how much excess revenue because it is difficult to break out coupon sales for C&D versus MSW waste, however. DSM's best estimate is that the C&D operation at Hartford netted roughly \$113,000 in revenues over costs in FY 11-12. This is important because ground C&D materials have been known to increase hydrogen sulfide emission at landfills which use ground C&D as cover material – as Lebanon does.

Lebanon is currently testing its landfill gas, and has had odor complaints. If the testing were to identify hydrogen sulfide as one of the landfill gas emissions of concern it is likely that Lebanon would no longer be willing to accept the ground C&D at no cost which would eliminate this important revenue source to Hartford.

Continuation of Current Transfer Station Operations

DSM believes that the Hartford transfer station continues to be valuable as a regional transfer station serving the Upper Valley. However, the transfer station is vulnerable as a stand-alone operation by the Town of Hartford because it already has relatively high fees when compared to both the Lebanon landfill (\$1 per 32 gallon container) and the Weathersfield Transfer Station (\$2 per 32 gallon container) which are both "full service" transfer stations accepting a broad range of materials like Hartford does. The Windham Solid Waste Management District Transfer Station in Brattleboro is another full service transfer station. The Windham District charges \$10 for the first 140 pounds which is essentially equivalent to \$2.20 per 32 gallon container assuming it weighs an average of 30 pounds. These charges can be compared against the coupon charge of \$3.05 for Hartford residents and \$4.05 for Greater Upper

Valley District residents; which would have to be pushed even higher if Lebanon were to stop accepting ground C&D at no cost. In addition, Hartford has deferred capital maintenance and improvements in an effort to hold costs down, and eventually these capital improvements will have to be addressed.

It should be noted here that a question has been raised as to whether Hartford could significantly expand recovery of reusable C&D material delivered to the transfer station as a way to reduce costs and increase revenues. It is DSM's professional opinion that, while this would be a way to reduce disposal of C&D materials, it would come at an increased operational cost to Hartford. It would require additional personnel and a storage facility to keep recovered materials out of the weather. Given that there are already two used building materials supply places in Hartford, it is unlikely that sufficient usable materials are being delivered to the transfer station to make this a viable undertaking.

One other issue of concern with respect to the current operations is the fact that the transfer station accepts cash payments for coupons. It is DSM's experience that this is not a good business practice because it is impossible to provide a fully auditable procedure to assure that all of the cash payments are correct and fully accounted for. Scale personnel on Saturdays are especially vulnerable to a charge of theft with no way to prove their innocence. For this reason DSM has recommended in our analysis of other transfer stations that no cash be accepted at the transfer station; instead that coupons be sold at convenience stores where full accounting is assured.

Recommendations

Based on the analysis described above there appear to be two primary paths moving forward. The first would be to optimize the existing Hartford only system. The second, and preferred option, would be to move toward a regional solution in which the Hartford transfer station plays an integral part in a larger regional system. Each alternative is described below.

Hartford Alone

Only roughly 20 percent of Hartford residents rely on the Transfer Station for refuse disposal, meaning that the remaining 80 percent already subscribe for garbage collection. In addition, Hartford already provides curbside collection of recyclables to all residents.

Subscription collection of refuse by multiple haulers is less efficient than having a single truck go down the road and collect waste from all households. And, as surveys of users of the Hartford transfer station indicate, people driving to the transfer station are already incurring costs similar to curbside collection simply by multiplying the number of trips per month reported by the survey respondents by the IRS automobile cost per mile rate.

For this reason, the optimum system for Hartford would be for Hartford to contract with a single hauler for weekly garbage and single stream recycling. It is DSM's professional judgment that this would double the recycling rate in Hartford, and at costs similar to what residents both subscribing for curbside collection of refuse, and driving to the transfer station are already paying.

This would then allow the Town to reduce hours at the transfer station to either one day per week, or at a maximum two days per week. The transfer station could then become the primary location for disposal of bulky and hard to handle wastes, and for recycling of materials other than materials collected curbside (e.g., scrap metals, some clean C&D materials, tires, car batteries, large plastic items).

To minimize involvement of the Town in the curbside collection contract, the contract could specify that the designated hauler provide large rolling carts for single stream collection of recyclables, and that the hauler be responsible for billing all households. To reduce costs, the Town could agree to be the payment collector of last resort because of the Town's ability to attach property for non-payment of services.

It is DSM's estimate that a curbside collection contract for refuse and recycling would cost roughly \$25 - \$35 per household per month depending on final bid specifications.

In the absence of a comprehensive solution involving refuse and recycling, if the Town wants to continue with the status quo, then it probably makes sense to discontinue the current curbside recycling collection program to take the cost off of the property tax, with the hope that Casella would begin to offer single stream (sort) recycling to its customers in Hartford.

Regional Solution

As discussed above, DSM believes that the optimum solution would be to convert the transfer station to a truly regional facility operated by the Greater Upper Valley District. This would spread the burden of operations over the many towns that currently now rely on the transfer station as the only real recycling and special waste management option available to them.

To accomplish this would require that the Greater Upper Valley District find a way to resolve the debt service associated with the bridge to the Hartland landfill site. One option would be for the region, including the municipalities using the Lebanon landfill, to purchase the Hartland landfill. This would provide the region with guaranteed landfill capacity for the foreseeable future, assuring that when the Lebanon landfill closed, a new site would be available. The cost of the purchase could be funded through a relatively minor surcharge on the tipping fee at the Lebanon landfill. Assuming that the cost would be the \$2.2 million the District currently still has in debt service, a tip fee surcharge ranging from \$3 to \$4 per ton could cover the debt service over period of 15 to 20 years.

This would then free up the District to take over management of the transfer station, using the District surcharge to provide for needed capital improvements and for the re-opening of the household hazardous waste storage facility located at the transfer station.

Next Steps

DSM believes that it is in Hartford's best interest to begin to have regional discussions concerning the potential viability of transferring ownership of the Greater Upper Valley Landfill to a regional consortium of municipalities.

DSM ENVIRONMENTAL SERVICES, INC.

Resource Economists
Environmental Scientists

In the interim Hartford should make sure to include sufficient capital reserves in on-going budgets to address equipment and deferred maintenance issues at the transfer station.

It will also be necessary for Hartford to make a decision as to whether it should move forward with a more formal contract for curbside collection of recyclables, or abandon that program.

Hartford should also monitor the landfill gas emission testing by Lebanon and ensure that Lebanon can continue to receive ground C&D. If Lebanon discontinues acceptance of ground C&D the Hartford transfer station finances change significantly and Hartford should immediately consider dropping C&D acceptance of sheet rock and also review the viability of the C&D facility altogether. If the Lebanon landfill gas emissions issue is resolved in a manner that allows for continued delivery of ground C&D as cover material then the current grinding contract for C&D should be renewed.

Signed:



Ted Siegler

4.4 Appendix IV: Draft Municipal Solid Waste Survey

DRAFT HSWC Town Survey 4-27-15

To residents of the Town of Hartford:

The Solid Waste Committee was commissioned in 2013 by the Selectboard to advise it about various aspects of waste management in the Town at this time of rapid change. There are many possible ways in which the Town might alter the ways it handles household trash, recycling, and food scraps. To help guide the process, we'd appreciate learning about you and your preferences.

THANK YOU FOR COMPLETING THIS SURVEY!

1. Do you live in the Town of Hartford? (please check one):

- no (if no, please don't complete the rest of this survey. Thank you!)
- yes (Please go to question 2.)

2. Do you/your household now choose how to dispose of your trash (that is, it's not managed by a landlord, condo association, or property manager)?

- no
- yes

A consultant hired by the Town advised that it would be cheaper per household if one single hauler were contracted to pick up each household's solid waste / recyclables (as is done in some other Upper Valley towns).

IF we were to choose for the Town to sponsor curbside pickup of trash, recyclables, (and perhaps food scraps), here's ROUGHLY what might happen:

- materials would be picked up every other week;
- materials would be picked up from the same locations where recyclables are now picked up in the Town-sponsored curbside recycling program;
- the Town would contract with **ONE** company to pick up all materials in Town;
- you'd have to put the materials out in "toters" (covered wheeled containers) that would be provided for you; and
- though property taxes may increase to pay for a town-wide contract, the increase per household would be less than what people typically pay now to have their trash removed.

3. Please indicate your support of the idea of Town-sponsored trash pickup as described above?

1 _____ 2 _____ 3 _____ 4 _____ 5 _____
Strongly opposed opposed neutral supportive strongly supportive

4. Could you or your household manage to get a “toter” (covered wheeled container) to the closest public road for trash pickup?

- no
- yes
- unsure

5. Do you currently pay someone directly to take away your trash?

- no (please go to question 6)
- yes

If yes, whom do you pay for this service (please check ONE box only):

- Casella
- More Waste Solutions
- Beauchene’s Waste Service
- F. Oakes Disposal

A.B.L.E.

other

6. Do you use the Hartford Transfer Station?

- no (You are done with this survey. THANK YOU!)
- yes (Please answer Question 7 below.)

7. IF it should happen that the Hartford Transfer Station needs to be open fewer days per week than it is currently open, what would be your TWO most convenient days to use the Transfer Station? (Please check only TWO.)

- Sunday
- Monday
- Tuesday

- Wednesday
- Thursday
- Friday
- Saturday

8. What village of the Town of Hartford is closest to where you live?

- Hartford
- Quechee
- West Hartford
- White River Junction
- Wilder
- Other

9. What age range best describes you?

- Under 20
- 20-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70+

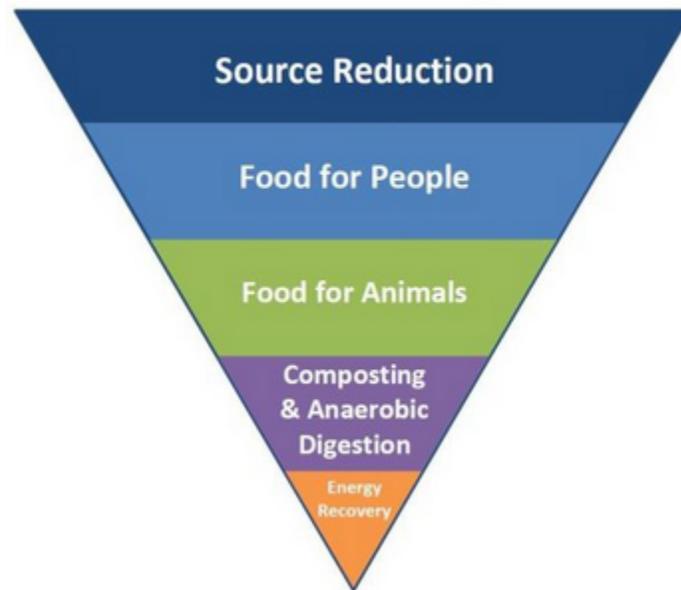
10. Please share any thoughts you have about improving waste disposal in Hartford.
[Open comment section]

You are done with this survey. THANK YOU!

4.5 Appendix V: Composting/Organics Management

Information from the Agency of Natural Resources

Vermont Food Recovery Hierarchy



Source Reduction

Reduce the amount of food residuals being generated at the source (in your kitchen), by strategically planning meals, shopping with a list, storing food properly, preparing and serving only what will be consumed, preserving leftovers

Food for People

Direct extra food of high quality to feed people by donating to food shelves and food banks.

Food for Animals

Use lower quality food residuals for agricultural purposes, such as food for animals.

Composting & Anaerobic Digestion

Direct food residuals and organics to home compost piles, commercial compost facilities, or for land application. No anaerobic digesters in Vermont accept food scraps at this time.

Energy Recovery

Processing food residuals and organics for energy recovery. This is the least preferred use of food residuals and may include collection of landfill gas for energy.

Timeline for organics provision enactment of Act 148:

July 1, 2014 – food scrap generators of at least 104 tons/year (~570 pounds/day) must divert material to any certified facility that will accept it, within 20 miles. Hartford has no entities that generate this much food scraps.

July 1, 2015 – food scrap generators of at least 52 tons/year (~285 pounds/day) must divert material to any certified facility that will accept it, within 20 miles; transfer stations must accept leaf & yard debris

July 1, 2016 – food scrap generators of at least 26 tons/year (~140 pounds/day) must divert material to any certified facility that will accept it, within 20 miles

July 1, 2017 – food scrap generators of at least 18 tons/year (~100 pounds/day) must divert material to any certified facility that will accept it, within 20 miles; transfer stations must accept food scraps

July 1, 2020 – food scraps banned from landfills

Composting Facilities

- Composting facilities are certified by the Department of Environmental Conservation, VT Agency of Natural Resources
- The closest certified composting facility to Hartford – Cookville Composting in Corinth, VT – is 30 miles by road from Hartford Town Hall.
- The GUVSWD site is certified for composting but is not operating.
- Anaerobic digesters in Vermont are usually farm-based. There are 11 of these that are now permitted to accept food scraps (enough potentially to process most of Vermont's food waste). However, two test sites are in operation to assess the economic viability of large-scale anaerobic operations.