

BIENNIAL REPORT ON SOLID WASTE

1987 Act 78, codified at 10 V.S.A. §6604(b)

2018 Act 208 §3

2018 Act 209 §3

Submitted to the
House Committee on Natural Resources, Fish and Wildlife
and Senate Committee on Natural Resources and Energy

Agency of Natural Resources
Department of Environmental Conservation



DRAFT

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I. INTRODUCTION

This biennial report on Solid Waste in Vermont, submitted in accordance with Act 78 (10 V.S.A. 6604(b)), enacted in 1987, includes updates on the status of Universal Recycling (Act 148), Extended Producer Responsibility (EPR), Bottle Bill, Household Hazardous Waste, and other solid waste topics and programs. It includes details on the volume, amount and toxicity of Vermont's solid waste stream. This submission also fulfills the reporting requirements in 2018 Act 208 §3 (organic hauling) and 2018 Act 209 §3 (bottle bill exemption for retailers).

II. UNIVERSAL RECYCLING

A. Universal Recycling Law

In 2017 Vermonters composted more than any time in the last 10 years. The amount of organic material managed by solid waste facilities increased 9% from 2016 to 2017. In addition, according to several recent surveys (UVM's 2018 Vermonter Poll and a 2018 Vermont Food Scrap Survey by Castleton Polling Institute, part of the upcoming 2018 Waste Composition Study) ~50-70% of Vermonters say they separate some of or all of their food waste by backyard composting or feeding animals.

If every Vermonter composted their food waste, it would be the same as taking over 7,000 vehicles off the road each year.

ANR has confirmed that 108 transfer stations in Vermont are offering food scraps collection, representing 100% compliance with this state requirement.

In 2017 recycling as measured by weight grew slightly and continues to remain stable, which is good considering that packaging is now up to 20% lighter.

Food donation to the VT Foodbank continues to rise and has almost tripled from 2014 to 2017.

Even with this good recycling, food donation, and composting work, 11% more Vermont materials went to the trash in 2017 than in 2016. This reversed decreasing disposal trends seen in 2015 and 2016.

B. Recycling Markets

Background: Vermonters regularly recycle plastic bottles, jugs, and containers, metal cans, glass bottles and jars, and paper and cardboard as required by law. Most of this material is processed by two recycling material recovery facilities (MRFs) in Williston and Rutland and some is processed at smaller facilities in Pownal and Lyndonville or sent to recycling facilities out of state. Over the last year, recycled materials, especially mixed paper (newspaper, office paper, cereal boxes, paper mail, magazines, etc.) and glass have lost value due to over-supply and fewer end markets for these materials. As a result, recycling facilities around the northeast are charging nearly double the amount they were a year ago to accept recyclable materials. To insulate Vermont and other New England states from abrupt changes in global markets we should work collaboratively to develop more local domestic markets for recyclable materials.

Recycling, Mixed Paper & China: Up until recently, approximately one-third of U.S. recycling was sent to China and China was importing about 50% of all U.S. recycled mixed paper (Source: National Public Radio and a July 2018 webinar by Waste Management, Inc.). The Chinese government has taken action to clean up the country's environment and in early 2018, China's National Sword initiative effectively banned the importation of many recyclable materials. This has resulted in a global over-supply of many recycled materials which has reduced the value of these commodities.

Of the recyclables Vermonters produce, mixed paper is most impacted by China's policies. For example, in May 2018 it cost the Williston single-stream MRF \$57.21 per ton to recycle mixed paper, as opposed to being paid \$87.92 per ton in July 2017.

Not all of Vermont's recycled paper was being exported to China however. Both the Northwest Vermont Solid Waste District (NWSWD) and the Northeast Kingdom Waste Management District (NEKWMD) collect, sort, and bail their own recycled paper. NWSWD sends theirs to the West Rock Missisquoi paper mill in Sheldon Springs Vermont to be made into food-grade box board like pasta and cereal boxes, while NEKWMD sends theirs to Green Fiber in Pennsylvania for use in cellulose insulation.

Recycled Glass: Glass from the Rutland single-stream MRF was sent to Strategic Materials' Franklin, Massachusetts, glass processing facility where the material was sorted, cleaned and refined into feedstocks for products like fiber glass insulation and new glass bottles. In the spring of 2018, Strategic stopped accepting recycled glass after the closure of a nearby bottle manufacturing plant. As a result, the regional markets for recycled glass dropped sharply.

What's Being Done:

Mixed Paper: In the spring of 2018, the Legislature authorized the ANR Secretary to issue a waiver allowing mixed paper disposal waivers if insufficient recycling markets exist. This provision expires July 1, 2019. To date, no waivers have been requested.

Representatives from ANR, owners of both single-stream MRFs, and the Agency of Commerce and Community Development met with Soundview Holdings Inc. (previously known as Putney Paper) to discuss expanding their Putney paper mill to process recycled mixed paper into paper towels, napkins, and bath tissue. Creating domestic markets for recycled materials will help sustain recycling and retain recycling jobs in the United States and Vermont.

Glass: ANR received a temporary request from Casella Waste Management to utilize recycled glass from the Rutland MRF in road base and construction projects at the NEWSVT landfill in Coventry. ANR granted the request for several months in 2018 and required Casella to submit short and long term plans for managing recycled glass.

Chittenden Solid Waste District has invested in glass processing equipment at their Williston MRF that can process glass to meet construction specifications. ANR has been working with VTrans, Chittenden Solid Waste District and local road crews to utilize processed glass aggregate (recycled glass) in road projects.

ANR has also met with representatives from Glavel—a New York based company that creates a foam glass aggregate from recycled glass for use in building and construction projects. Glavel representatives are proposing to build a foam glass manufacturing facility in St. Albans Vermont. The facility will use glass powder as a feedstock, and there is the potential that some recycled glass from VT could eventually be used by this facility if it is able to be processed to their specifications.

For more on recycling markets and possible EPR for paper and packaging see Section III. B.

C. Food Scraps Management

Under current law, solid waste haulers will be required to offer collection of food scraps to all customers starting July 1, 2020, the same date when food scraps would be banned from disposal in trash and in landfills. Act 208, passed in 2018, requires the Agency of Natural Resources to seek input from the Universal Recycling Stakeholder Group as to:

- (1) “[Hauler Food Scrap Collection Requirement] whether 10 V.S.A. § 6607a(g) should be amended so that commercial haulers are only required to offer collection of food residuals: (A) in municipalities, solid waste management districts, or other areas based on population, housing, or route density; or (B) based on other appropriate criteria specified by the Stakeholder Group, and;

(2) [Food Scrap Processing Capacity] whether sufficient regional capacity to process food residuals is available to allow for the collection of food residuals by all commercial solid waste haulers beginning on July 1, 2020.”

Further Act 208 directs the Agency to provide recommendations to items 1 and 2 in this Biennial Solid Waste Report.

1. Hauler Food Scrap Collection Requirement

On July 13, 2018, ANR circulated an electronic survey about the solid waste hauler food scrap collection requirement to 373 stakeholders including 277 solid waste haulers and 96 Universal Recycling stakeholders including 29 solid waste districts, alliances, and independent towns; and a few nonprofits and businesses. The survey asked respondents to rank their top three (3) choices out of nine (9) options regarding possible changes to the hauler food scrap collection requirement. See Appendix C to view the survey.

Survey Results: Of the 373 survey recipients, 42 responses were received, from 26 haulers (out of 277 total haulers), 13 solid waste management entities (SWMEs) (out of 29 total SWMEs), and three others including two businesses and one non-profit. Survey results are shown in the tables below.

Points were assigned to determine a weighted total and weighted average for each respondent type.

Table 1. Hauler Responses by Percentage

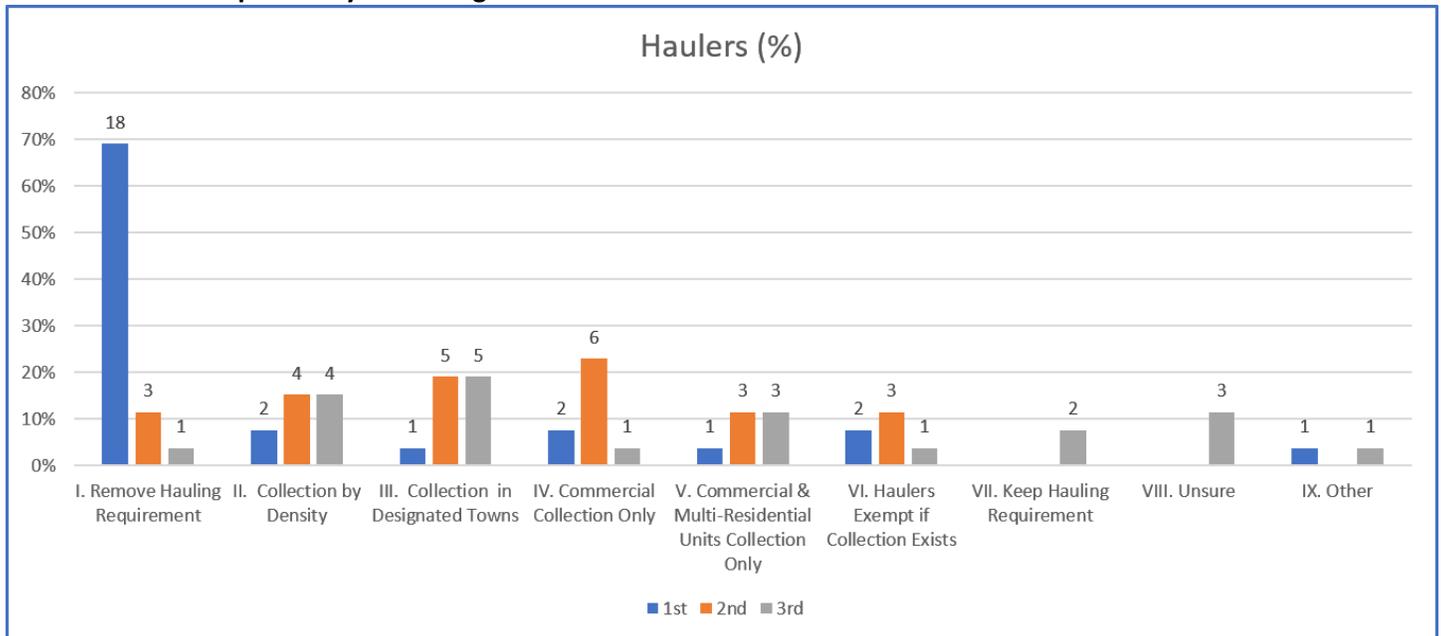


Table 1 shows the percentage of solid waste haulers (haulers) that gave a first, second, or third choice for the nine options available. Nearly 70% of haulers that responded to the survey chose Option I as their first choice, which would remove the food scrap collection requirement. Second and third choice options were more evenly spread across the other options.

Table 2. Hauler Responses by Cumulative Points

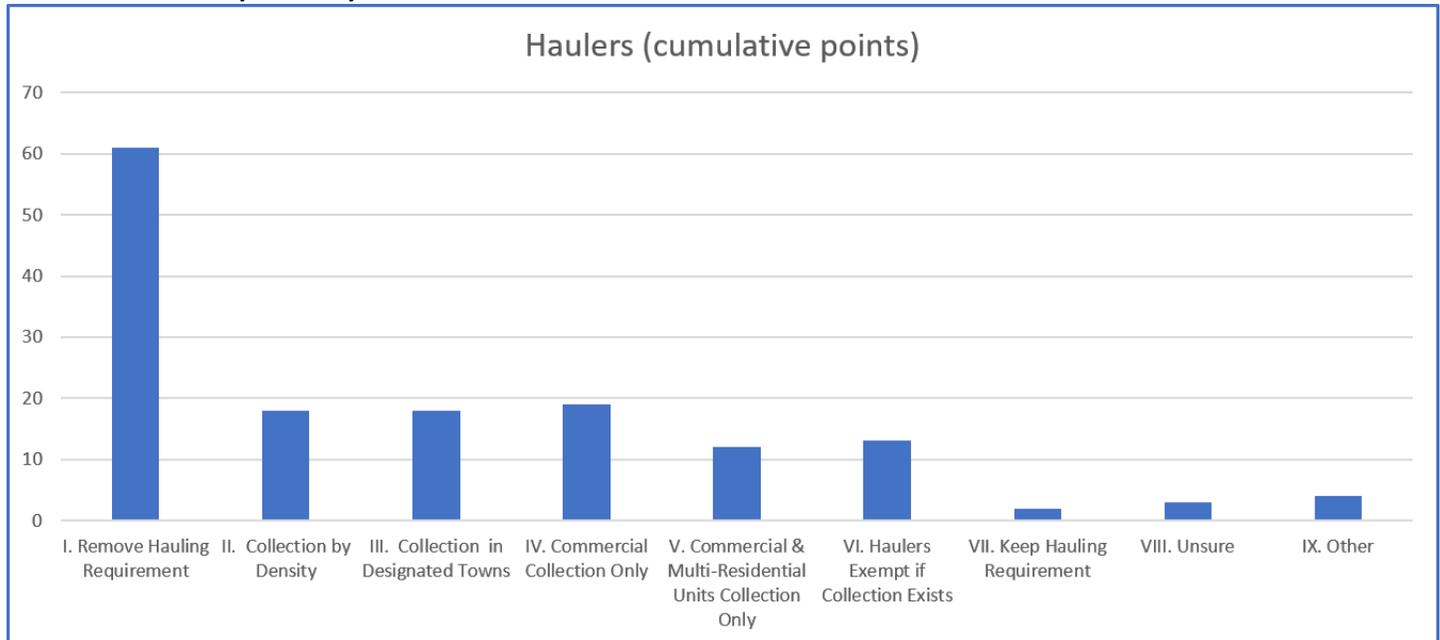


Table 2 applies weighted points to each choice, meaning a first choice was given 3 points, a second choice was given 2 points, and a third choice was given 1 point. Then the cumulative points were added together for each option. Viewing the data in this way shows that haulers that responded to the survey still strongly favor Option I, removal of the hauling requirement, followed by a fairly even distribution of responses for options II-IV, which limited the hauling requirement in various ways.

Table 3. SWME Responses by Percentage

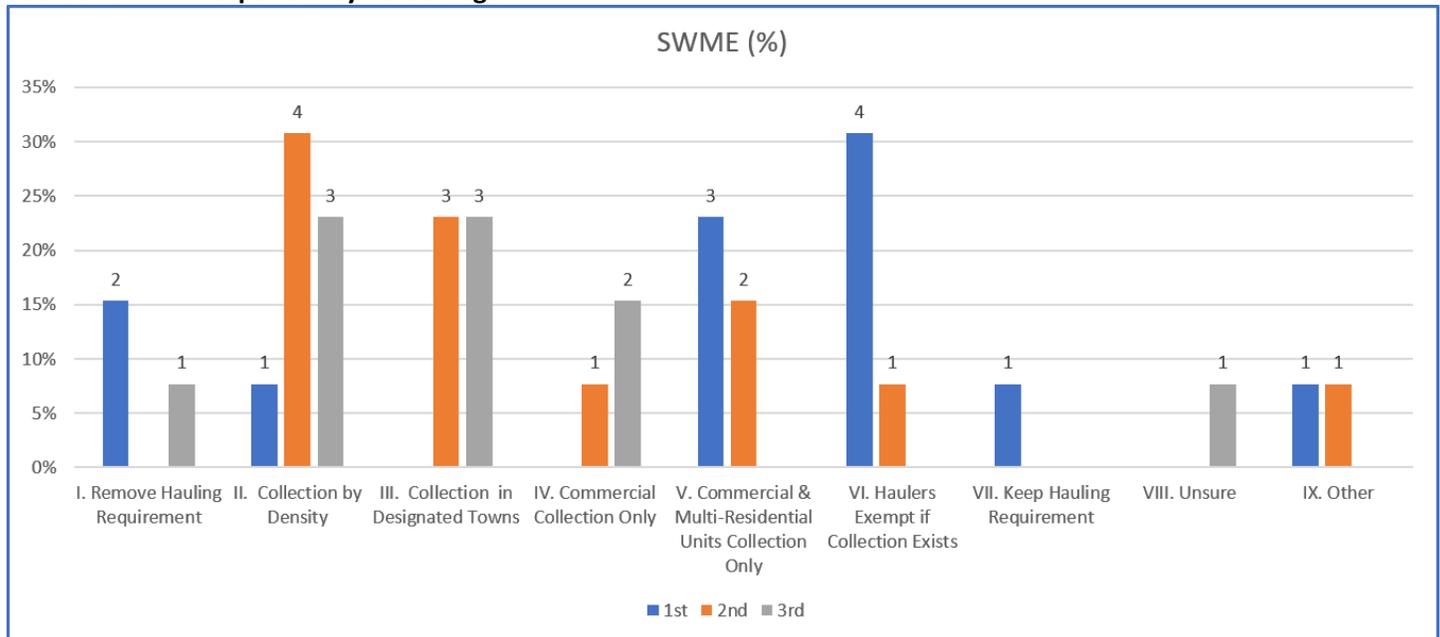


Table 3 shows the percentage of solid waste management entities (SWMEs) that gave a first, second, or third choice for the nine options available. SWME responses were more evenly distributed among options, however Option VI was a leading first choice pick, that would exempt haulers from offering food scrap collection if other haulers were providing the service. This choice was followed closely by Option V, that would only require food scrap collection be offered to commercial and multi-residential customers. Second choice votes favored limiting the food scrap collection requirement to dense areas (Option II.) or to designated towns (Option III.).

Table 4. SWME Responses by Cumulative Points

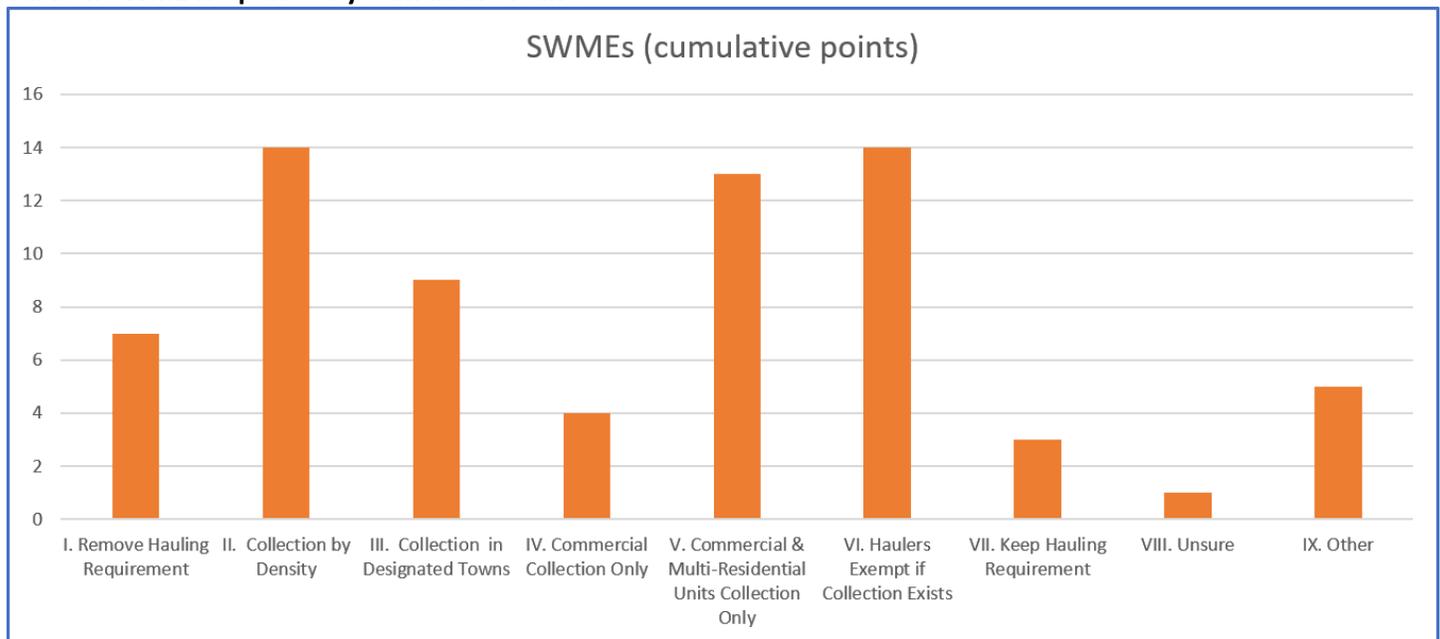


Table 4 applies weighted points to each choice, meaning a first choice was given 3 points, a second choice was given 2 points, and a third choice was given 1 point. Then the cumulative points were added together for each option. Viewing the data in this way shows that SWMEs that responded to the survey gave a diversity of responses, with top points for collection required in dense areas (Option II), haulers being exempt if other haulers are offering the service (Option VI), and haulers being required to only offer services to commercial and multi-residential customers (Option V).

ANR Recommendations for the Hauler Food Scrap Collection Requirement: Given that most haulers wish to remove the hauling requirement and SWMEs generally prefer service in dense areas, services only to commercial and residential customers, or a hauler exemption, the Agency recommends the Legislature amend the Universal Recycling law to only require haulers to offer collection of food scraps to their commercial customers and multi-residential (4 or more units) customers, unless they can demonstrate another hauler is providing such collection services in that area.

This amendment would:

- a. Exempts all haulers from collecting of food scraps from single family residents and multi-residential units of less than 4 units.
- b. Allows the market to work by exempting haulers from offering collection of food scraps from commercial customers (such as businesses) or multi-residential (4 or more units) when they can show that another hauler is collecting in that area. This provides a business opportunity for those haulers that want to pick up food scraps.
- c. Simplifies the existing hauler exemption process for food scrap collection which currently requires an amendment by a SWME to their Solid Waste Implementation Plan (SWIP)
- d. Haulers can also subcontract collection services (as allowed under current law).
- e. Assures food scrap collection services will be provided to businesses and larger multi-residential units that produce the most food waste and who would have the most difficulty composting onsite or self-hauling to nearby drop-off locations.

2. Regional Food Scrap Processing Capacity Analysis

The Universal Recycling law, Act 148 of 2012, phases in a disposal ban on food scraps beginning July 1, 2020. Since the passage of this law ANR, SWMEs, and other stakeholders have been working to support development of food scrap processing infrastructure. Act 208 (2018) requires the Agency of Natural Resources seek input from the Universal Recycling Stakeholder Group on the regional capacity for processing food scraps. The goal is to assess the degree to which it will be reasonable for all solid waste haulers that collect trash to offer collection of food scraps from their customers beginning on July 1, 2020.

Estimating the projected need for food scrap processing in 2020 as well as the potential capacity is difficult. For example, food scraps fed to animals is not required to be reported to ANR. Current capacities and expected needs vary by facility and region, so ANR, with input from the stakeholder group have used the best available data to estimate a low and high range of capacity for processing food scraps in 2020. **The estimates provided in this section are conservative. ANR recommends the food scrap processing capacity be reassessed in early 2019 with the 2018 Waste Composition Study and any additional capacity gained from ANR's grants for food scrap processing infrastructure.** On September 5, 2018, the ANR Department of Environmental Conservation, Solid Waste Program released a request for proposals for up to \$975,000 in grants to solid waste districts and municipalities for food scrap processing projects like expanded composting, anaerobic digestion or organics transfer station facilities.

The following factors could significantly influence food scrap processing capacity in 2020:

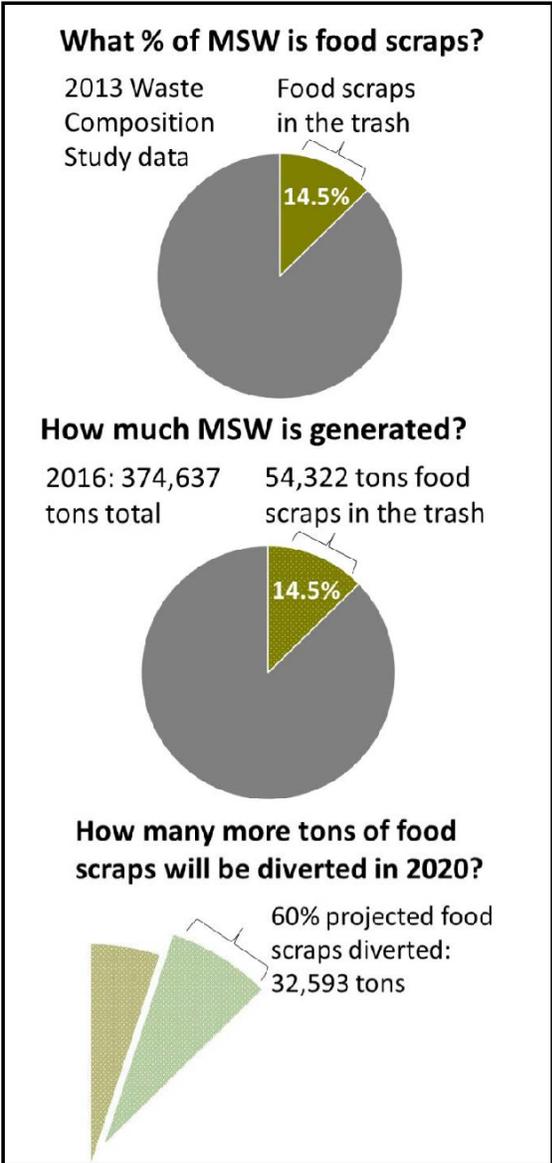
- 1. New/expanded processing capacity could be significant.** Several anaerobic digester (AD) projects are being considered in Vermont that were not part of this analysis. In addition, there is out-of-state AD capacity that was not part of this analysis. ANR also recently released up to \$975,000 for expanding composting and AD projects.
- 2. 60% diversion is optimistic.** The 2013 Systems Analysis estimated that by 2020, 60% of previously disposed food scraps would need processing, however study authors acknowledge this is “an extremely aggressive diversion rate and that despite the ban, significant quantities of food residuals and other organics will still be going to the landfill” (p. 60, footnote 71).
- 3. Food waste reduction, food donation, and feeding animals can reduce processing needs.**
 - a. Waste reduction**, is practiced by many Vermont businesses, as it saves money.
 - b. Food donation**, has almost tripled from 2014 to 2017 according to the VT Foodbank.
 - c. Feeding animals**, is difficult to quantify and not tracked well.
- 4. Home composting and community composting may be underestimated.** UVM's 2018 Vermonter poll recently found that 72% of respondents reported that they compost food scraps or feed pets or animals. The 2018 Waste Composition Study will include an updated estimate of how many people compost at home in Vermont.
- 5. Small farm composting is underestimated and has increased in recent years.**
- 6. Chicken farmers/composters are uncertain about the future.**
- 7. More demand for compost products and available wood chips could motivate composters to process more material.**

Preliminary VT Food Scrap Processing Capacity*

*Food Scrap Processing Capacity should be Reassessed when 2018 Waste Composition Data is complete in January 2019.

Need

An ESTIMATED ~15,300 tons food scraps were processed in 2017



Estimated Total need in 2020:
15,300 + 32,600 = **47,900 tons**

Capacity Range

An ESTIMATED range of ~23,500 to ~36,400 tons could be processed in 2020.
(From ReTRAC and DEC survey data)

Gap Range

Need – Capacity = Gap

47,900 tons – 23,500 tons = **24,400 tons**

47,900 tons – 36,400 tons = **11,500 tons**

By Region

Counties	Population (2017)	2020 Need	2020 Capacity Range	2020 Gap Range
Statewide	623,657	47,900	23,460-36,427	11,473-24,440
Addison	36,776	2,825	1,383-2,148	677-1,441
Washington, Lamoille	83,627	6,423	3,146-4,885	1,538-3,277
Chittenden	162,372	12,471	6,108-9,484	2,987-6,363
Caledonia, Essex, Orleans	63, 235	4,857	2,379-3,693	1,163-2,478
Franklin, Grand Isle	56,023	4,303	2,107-3,272	1,031-2,195
Bennington, Rutland	94,681	7,272	3,562-5,530	1,742-3,710
Orange, Windsor	84,074	6,457	3,163-4,911	1,547-3,295
Windham	42,869	3,293	1,613-2,504	789-1,680

Food Scrap Processing Operations that were included in this analysis:

Black Dirt Farm	Lebanon Landfill Compost Facility, NH
Casella Organics Recovery Facility	Martin’s Farm, Compost Facility, MA
Cloud’s Path Farm	Middlebury College Compost Facility
Cookeville Compost	Salisbury Digester
Green Mountain Compost	TAM Organics
Grow Compost	Vermont Natural Ag. Products
Hudak Farm	VTC Digester
Kingdom View Compost	Vermont Compost Company
Lamoille Soil	Windham SWMD Compost Facility

See Appendix D for a map of Organics Capacity Regions and Facilities.

III. EXTENDED PRODUCER RESPONSIBILITY, HOUSEHOLD HAZARDOUS WASTE, AND BOTTLE BILL

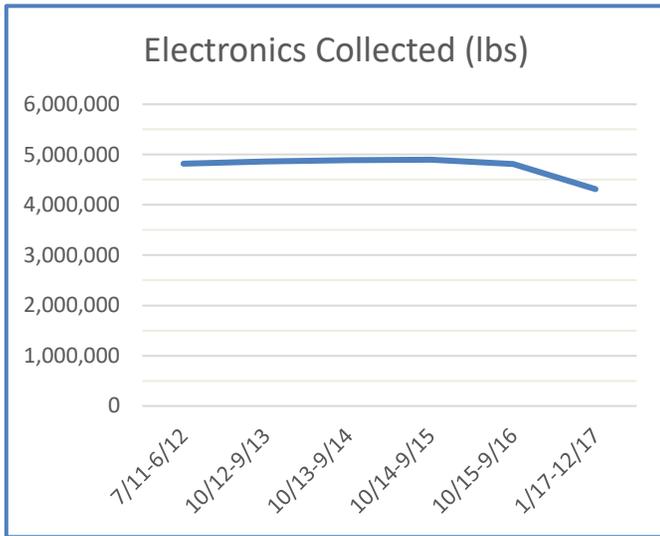
A. Existing Extended Producer Responsibility Programs

Vermont's Extended Producer Responsibility (EPR) laws share the cost of recycling and safe materials management between manufacturers and consumers, alleviating financial burdens on municipalities and mitigating environmental impacts from disposal by increasing collection and recycling rates of covered products. Vermont's EPR programs are effective at collecting these targeted materials largely due to the convenient collection locations throughout the state, efforts by SWMEs and private facilities, and outreach to consumers.

Performance of Existing Extended Producer Responsibility Programs

PRODUCT	AMOUNT COLLECTED IN PROGRAM YEAR 2017	CONVENIENCE	IMPACTS
Electronics	4,312,381 lbs of electronics (6.89 lbs per capita)	Over 100 collection sites across the state	<ul style="list-style-type: none"> • Highest per capita collection rate nationally • Lbs declining due to fewer CRTs
Mercury Lamps (Bulbs)	202,926 lbs of lamps	Over 150 collection sites across the state	<ul style="list-style-type: none"> • Highest recovery and per capita collection rates nationally
Mercury Thermostats	2,468 thermostats	Over 160 collection sites across the state	<ul style="list-style-type: none"> • 166.6 lbs of mercury collected since start of program in 2010 • Highest per capita collection rate nationally
Mercury Auto Switches	244 switches	70 participating collection sites	<ul style="list-style-type: none"> • 5,606 switches and 12.34 lbs of mercury collected since start of program in 2007
Primary Batteries	133,619 lbs of batteries	98% population within 10 miles of a collection site	<ul style="list-style-type: none"> • Collection of primary batteries has increased by 2,300% since program started • Collection of rechargeable batteries has increased by 43% since program started
Paint	96,109 gallons of paint (July 2016-June 2017)	99.5% population within 15 miles of a collection site	<ul style="list-style-type: none"> • Collection has increased by an average of 78% since the program started • Highest recovery rate of all state programs

1. Electronics



Electronic waste (E-waste) is a growing and problematic waste stream that can contain toxic materials (such as lead, mercury, and chromium) as well as valuable materials such as precious metals, steel, aluminum, and recyclable plastics.

Since its inception in 2011, the Vermont E-Cycles program has had the highest per capita electronics collection rate of any state program and has collected more than 30 million pounds of electronics since the program began.

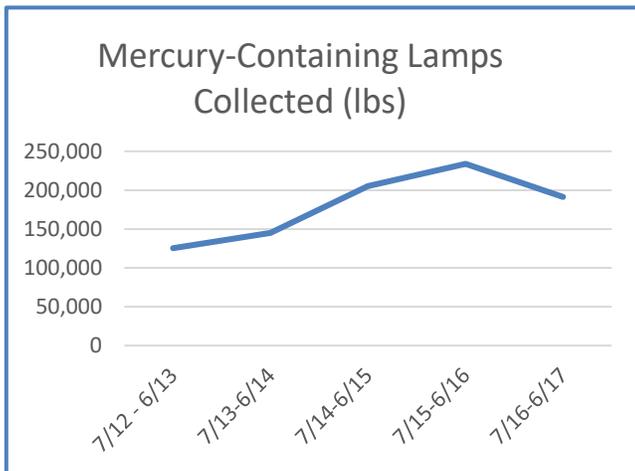
In the current program year, 90 registered manufacturers of computers, monitors, TVs, and printers pay 100% of program costs, allowing Vermont residents, small businesses, charities, and school districts to recycle these items along with computer peripherals at no cost.

For the first time since the start of the E-Cycles program, 2017 collection weights fell slightly, which is attributable to electronic devices becoming smaller and lighter, especially the decrease in heavy cathode ray tubes (CRTs) from older televisions and computer monitors in favor of flat screens. In earlier years, CRTs represented 65-75% of the total weight of e-waste collected; and currently, CRT televisions represent only about 40% of the materials collected.

2. Mercury-Containing Lamps (Bulbs), Thermostats & Auto Switches

Mercury is a highly toxic heavy metal that is released into the environment when mercury-containing lamps, thermostats, auto switches and other devices are broken or discarded. Even a small amount of mercury can damage lakes and streams poisoning fish and wildlife and exposing humans to its damaging effects. Vermont’s Mercury Education and Reduction Campaign (MERC) has undertaken a number of efforts to remove mercury from the solid waste stream.

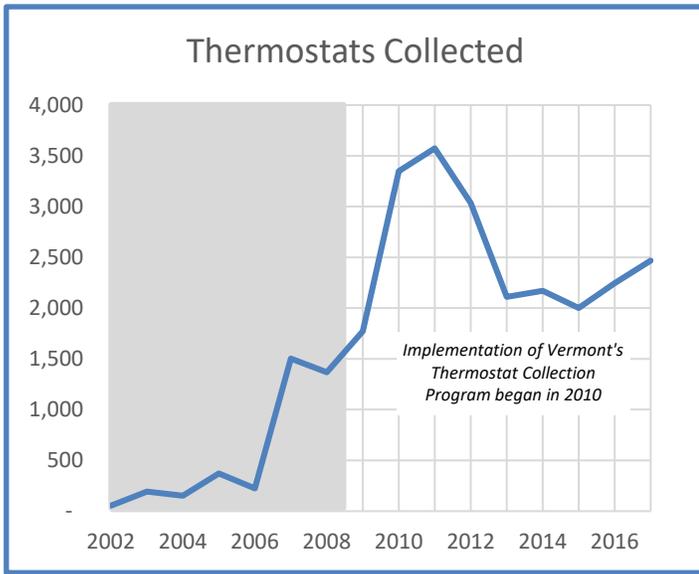
Mercury-Containing Lamps (Bulbs)



Vermont’s mercury-containing lamp recycling program, run by the National Electrical Manufacturers Association (NEMA) since 2012, has offered collection and recycling of fluorescent (linear and compact fluorescent) and high intensity discharge (HID) (mercury vapor, metal halide, and high-pressure sodium) lamps at retailers and through solid waste districts and alliances throughout Vermont.

While the collected weight of mercury-containing lamps (bulbs) fell slightly in 2016-2017, ANR anticipates collection will remain steady or may even rise as LED bulbs continue to replace large numbers of mercury-containing bulbs currently in use.

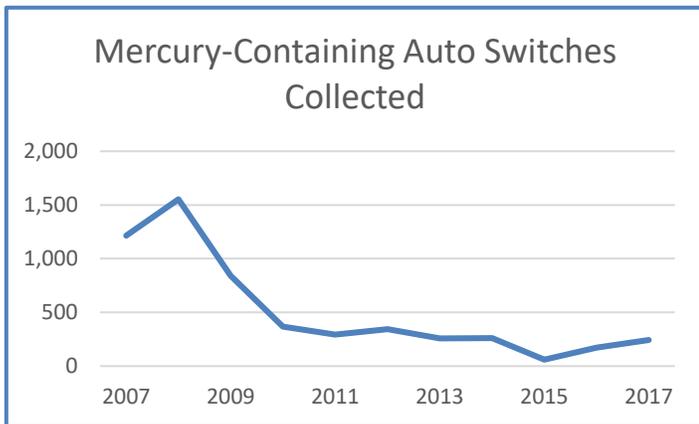
Mercury-Containing Thermostats



Vermont’s mercury-containing thermostat recycling program, run by product stewardship organization Thermostat Recycling Corporation (TRC) since 2010, offers collection and recycling of thermostats with a \$5 rebate for each thermostat collected.

Although Vermont has the highest per capita collection of mercury-containing thermostats of any state, collection numbers dropped in years with less education and outreach to the public, retailers, and wholesalers. While sales of mercury-containing thermostats have been banned in Vermont since 2006, many remain in Vermont’s older housing stock, and ANR anticipates that, with more consistent outreach efforts, mercury-containing thermostat collection and recycling will continue to hold steady.

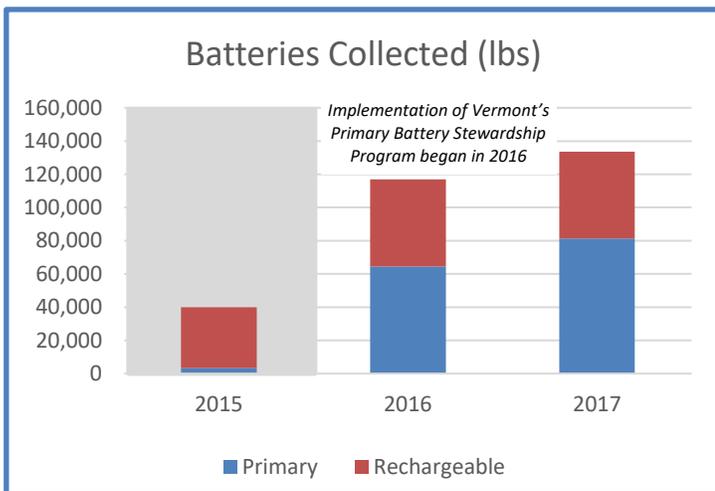
Mercury Auto Switches



Vermont’s mercury-containing auto switch recycling program requires motor vehicle recyclers to remove mercury-containing auto switches prior to crushing/shredding. Auto recyclers can send these switches, at no cost, to a national program for proper management. Mercury-containing auto switches were fully phased-out of vehicles after 2003, and collection rates are declining, however, there are still vehicles with auto switches that have not yet reached end-of-life. As a result, the National Vehicle Mercury Switch Recovery Program and the corresponding Vermont legislation implementing collection of mercury-containing auto switches have been

extended from their original sunset date to a new sunset date of December 31, 2021. See 2018 Act 168 §§ 15-17.

3. Primary Batteries



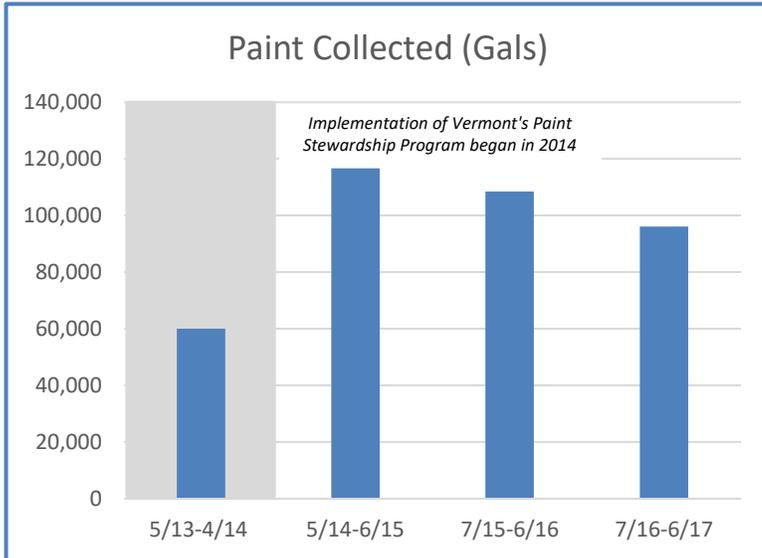
Vermont’s successful and growing Primary Battery Stewardship program, run by Call2Recycle since 2016, offers collection and recycling of non-rechargeable batteries weighing two kilograms or less, including alkaline, carbon-zinc, and lithium metal batteries.

Call2Recycle’s [2017 annual report](#) on Vermont’s program provides further details. Their work with solid waste management entities to make collection sites widely available has significantly increased collection and recycling of both primary and rechargeable batteries.

In January 2019 ANR will submit a progress report to the Legislature evaluating implementation of the battery

stewardship program and considering whether to add batteries within products to the stewardship program based on sort data (Call2Recycle is required to conduct periodic sorting of batteries collected). It will also discuss possible safety concerns related to increased use of lithium batteries, and what batteries in addition to lead acid batteries might be added to the list of items banned from disposal in Vermont.

4. Paint



Vermont’s Paint Stewardship program, run by the product stewardship organization PaintCare since 2014, offers collection and recycling of interior and exterior latex and oil-based paint.

Paint collection has increased by an average of 78% since the start of the stewardship program, with 99% of the oil-based paint collected being used for fuel and 1% for reuse, while 77% of the latex paint was re-blended into new paint. PaintCare estimates 10% of paint sold is leftover. A current 9.7% recovery rate (96,109 gallons collected of 995,193 gallons sold) is significantly higher than anticipated and higher than any other state paint stewardship program. For further detail, click on this link to [PaintCare’s annual reports about Vermont](#).

B. Future Extended Producer Responsibility Programs

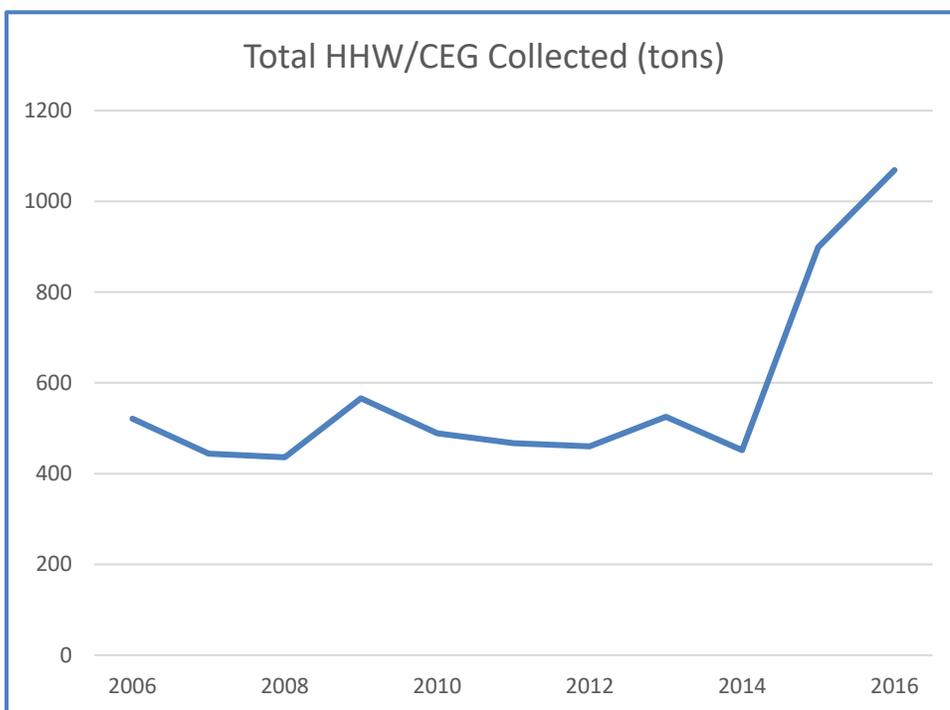
Packaging and Printed Materials: With the implementation of the Universal Recycling law (Act 148 of 2012) and EPR programs, Vermonters are recycling and composting more materials by weight today than ever before, resulting in diversion of over 216,109 tons in 2017. That said, there remains a vast amount—more than 150,000 tons per year—of recyclable and non-recyclable packaging and paper-based products that are being disposed. In addition, recycling markets have fallen significantly, forcing both municipal and private recycling managers and haulers to shoulder more costs and increase staff time and equipment to sort recyclables and deal with the high costs of finding recycling markets for mixed paper and glass. Ultimately, these are costs that are passed on to consumers who are now paying more for recycling.

To significantly decrease the amount of materials that are disposed and increase the amount recycled, more must be done to target packaging and printed materials. The Agency is examining how other states, counties, and countries are addressing this portion of the waste stream. Two Canadian provinces and several European countries require EPR programs for packaging and printed materials (paper-based products), where manufacturers of these materials are financially responsible for a program to sustainably manage these materials. Such programs can improve recycling markets by incentivizing packaging and print manufacturers to reduce packaging and use materials that are recyclable. These programs also improve the recovery rate for recycled materials, create more different types of materials that can be collected and recycled, and shift the recycling cost burden from consumers and municipalities to manufacturers who produce these products and materials.

C. Household Hazardous Waste

Vermont statute requires the DEC Solid Waste Program to address the volume and toxicity of the municipal waste stream, including management of Household Hazardous Waste (HHW)—such as bleach and ammonia, drain cleaners, pesticides/herbicides, and flammables like lighter fluid. Since the early 1990s, Solid Waste Management Entities (SWMEs) in Vermont have been required to include provisions in their Solid Waste Implementation Plans (SWIPs) for the management of HHW. To assist SWMEs with the expense of HHW collection and management, DEC has issued between \$400,000 - \$600,000 in annual “SWIP” grants since 2007. Even with this grant funding, the cost of collecting and managing HHW is expensive and requires additional financial resources from the SWMEs.

Households and conditionally exempt generators (CEG) generally have two options for disposing of hazardous waste: (1) fixed, full-time facilities located in several locations throughout the state and (2) numerous, half-day, collection events hosted by SWMEs throughout the year. Each year the total amount of HHW and CEG Hazardous Waste collected by SWMEs has continued to increase, as have participation rates. In 2017, tons of HHW /CEG waste was collected.

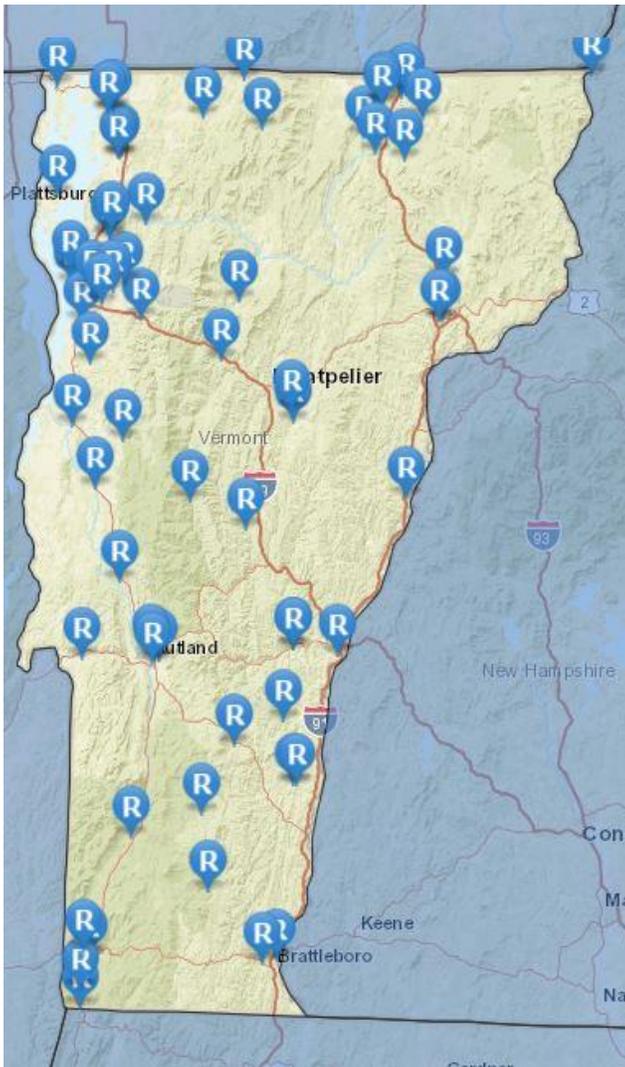


In the summer and fall of 2017, ANR organized a stakeholder group comprised of solid waste districts, towns and alliances, haulers, trade associations, state representatives, hazardous waste contractors and environmental non-profits to discuss the current state HHW and best ways to manage it in VT.

The group recommended a shared network of regional HHW facilities distributed throughout the state with possible rural collection events as the best option to consider and explore further. There was no consensus on the best option for funding this model, but various suggestions were discussed and are listed in the [HHW Stakeholder Group Summary](#).

During the 2018 Legislative session, an Extended Producer Responsibility (EPR) bill for HHW—**H560**—was introduced by the VT Product Stewardship Council and sponsored by Representative David Deen. The bill, which passed the House but not the Senate, would have required manufacturers of HHW products to participate in stewardship organization responsible for the collection and end-of-life management of their products. The bill proposed a similar EPR model as the Primary Battery law adopted in 2014. More research needs to be done to understand how many manufacturers would be covered by an EPR program for HHW; how many products would be covered; and the implementation costs of such a program. ANR will continue to evaluate an EPR model for managing HHW and other possible strategies to promote and fund an efficient HHW collection system.

D. Bottle Bill



Over the past few years, ANR has been making efforts to modernize and update the 40-year-old beverage redemption “Bottle Bill” program. With input from stakeholders, an online brand registration system was developed. Beginning in July 2018, all manufacturers must register brands via that system, which allows easy updates to a manufacturer’s registration and streamlines administration. Updates to the list of certified redemption centers have been made and a public-facing map is under development, which will allow customers and retailers to easily find their closest redemption options.

Exemption Guidance

Vermont’s bottle bill requires retailers to redeem beverage containers unless redemption centers “serve the public need.” 10 V.S.A. § 1523(b). In section 4 of 2018 Act 209, the Legislature struck ANR’s requirement that a retailer must show that a redemption center is located within 5 miles in order to obtain an exemption from the collection mandate. The Legislature further directed ANR to recommend changes to its rule. ANR recommends that an exemption shall be granted if there is an alternative redemption location within 5 miles of the retailer and, may be granted if there is an alternative redemption location within 10 road miles of the retailer or demonstrably within the current shopping patterns of community members. Program considerations include the type of alternate redemption location as well as the volume of sales of the retailer requesting exemption and their proximity to larger volume retailers. See Appendix E for recommended criteria.

ANR has requested comments on the criteria from interested parties, including retailers, redemption centers, members of the public (public interest groups), manufacturers/distributors. Comment period was still pending when this draft report was released. ANR has received and granted one exemption request since this statute became effective in July 2018.

IV. Diversion & Disposal Goals and Beyond Waste Materials

A. Landfill Disposal Bans

Under Vermont state law, V.S.A. § 6621a(a), “No person shall knowingly dispose of the following materials in solid waste or in landfills”:

- | | |
|--|--|
| 1. lead-acid batteries, | 7. mercury added products, |
| 2. waste oil, | 8. banned electronic devices, |
| 3. white goods (refrigerators, stoves, etc.), | 9. mandatory recyclables, |
| 4. tires, | 10. leaf/yard residuals, wood waste, and |
| 5. paint, | 11. food scraps after July 1, 2020. |
| 6. batteries-nickel-cadmium, small sealed lead acid, non-consumer mercuric oxide | |

Many of these materials are hazardous materials, whose disposal adds to the toxicity of the waste stream. Some non-hazardous materials are also banned because they can reduce waste and have existing cost-effective and convenient options for recycling, collection, and safe end-of-life handling. Among these materials are tires, household appliances, mandated recyclables (aluminum and steel cans, glass bottles and jars, plastic bottles and containers PET and HDPE, cardboard and paper); and leaf, yard and clean wood debris. Food scraps will be added to this list effective July 1, 2020. Additional landfill ban options have been considered by stakeholders, including tires, textiles, and construction & demolition waste, based on the recommendations of the [Beyond Waste Advisory Group](#) in 2015.

As waste streams have evolved, DEC no longer prioritizes addressing chlorides in the waste stream, instead focusing on general reduction of toxicity in packaging through waste prevention and consumer education. The primary challenge of product packaging for Vermont today is lack of robust domestic markets especially for recyclables like glass, mixed paper, and lower grade plastics as well as the lack of recyclability for a diverse array of packaging, such as Styrofoam and multifilm containers and pouches. See Section II B. on Recycling Markets and Section III B. on Future Extended Producer Responsibility Programs for more information.

B. Materials Management Plans

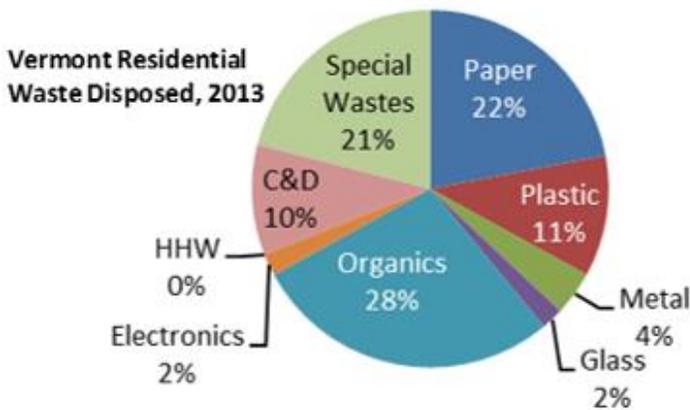
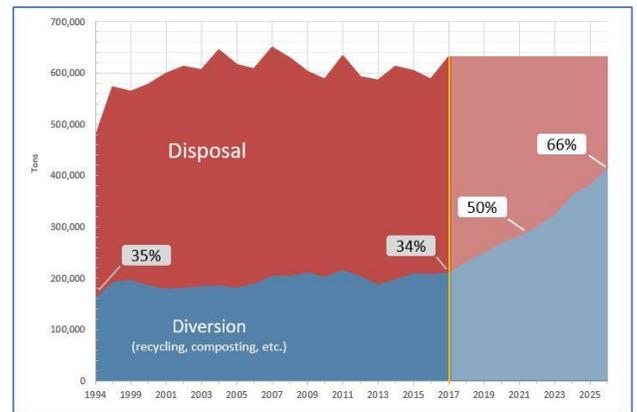
Vermont law (10 V.S.A. § 6604), requires ANR to adopt a solid waste management plan and revise it every five years. The latest plan was adopted in 2014, called “Vermont Materials Management Plan (MMP)” to shift away from “waste” towards a sustainable materials management vision that recognizes that materials we no longer need still have value. The MMP is an action-oriented document designed to guide reduction of the amount and toxicity of solid waste in Vermont, with performance standards and benchmarks for ANR and Solid Waste Management Entities (SWMEs) across five material streams (recyclables, organics, construction & demolition debris, household hazardous waste and biosolids).

State law requires that SWMEs manage solid waste within their jurisdiction in conformance with the MMP. Since adoption of the MMP in June of 2014, each SWME has submitted and received approval from DEC on their individual solid waste implementation plan (SWIP). Of the 29 SWMEs operating in Vermont, as of September 2018, 10 are chartered solid waste districts, 6 are groups or alliances of towns with formal partner agreements, and 13 are independent towns. Appendix B reflects the current map of the SWMEs operating in the state.

C. Disposal & Diversion Goals

[The Final Report will contain information from the 2018 Waste Composition Study.]

The 2014 MMP’s 5-year goal is to reduce **Disposal** of municipal solid waste (MSW) in Vermont by 25% from 413,517 tons to approximately 306,772 tons by 2019, the end of the 5-year Plan term. Disposal is the total amount of materials Vermonters put into the trash and that are landfilled each year. ANR proposes to meet the 25% disposal reduction goal through implementation of the Universal Recycling law, and a variety of new and existing efforts to educate and offer services to Vermont citizens and organizations to reduce, recover, reuse, recycle, and compost certain materials. While good progress at decreasing disposal had been achieved by a 8.5% reduction from 2014-2016, it recently increased 11% in 2017.



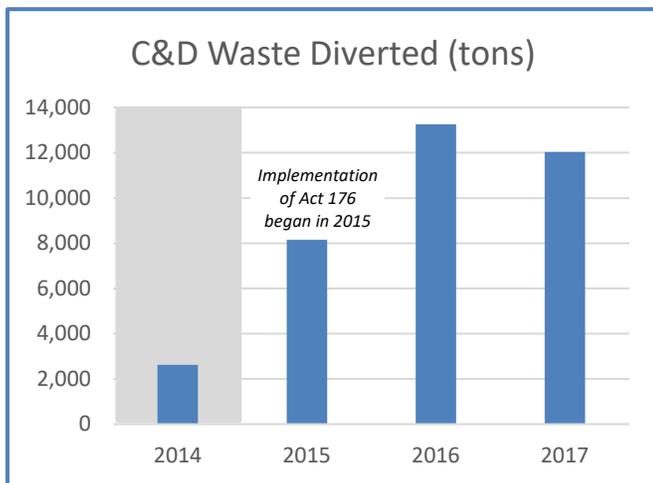
The MMP sets a second goal to increase the statewide **Diversion** of all MSW (the amount of material recycled, reused, or composted divided by the amount disposed) from approximately 30-36% to approximately 50% with full implementation of the Universal Recycling law and the MMP by 2020. This goal was developed in part based on the 2013 Waste Composition study, which showed approximately 50% of materials currently being landfilled could be recycled, donated, or composted. The remaining 50% of the waste stream was addressed through a “Beyond Waste” stakeholder process, which determined that up to 66% of the waste stream could be diverted instead of being disposed if material-

specific programs were implemented to capture materials such as packaging and print materials, textiles, carpets, and bulky items.

D. Construction & Demolition

Although C&D materials make up a significant segment of the waste stream, reuse and recycling is often hindered by a lack of convenient and cost-effective C&D recycling facilities. C&D materials frequently have a low recycling market value and often require sorting, chipping, and grinding before being marketable. Trucking distance can play a big role in recycling cost-effectiveness as national trucking costs have significantly increased due to firmer regulation and tracking of trucker hours and fewer people choosing truck driving careers. Deconstruction can yield the most salvageable, reusable and recyclable materials, but has been slow to grow due to increased costs/time versus demolition.

In 2014 the Vermont Legislature adopted Act 175 that requires the recycling or reuse of six construction and demolition (C&D) materials from large projects within 20 miles of a C&D recycling facility. The six materials include metal, clean wood, asphalt shingles, drywall, and oriented-strand board and plywood.



In Chittenden County, where Myers and Casella have both recently built C&D recycling facilities, the Chittenden Solid Waste District reports C&D recycling doubled from 2014-2017. The combination of more facilities collecting and recycling C&D materials near Vermont's construction areas with access to better end markets is the only way to make C&D recycling cost-competitive with disposal.

In addition, the Agency of Natural Resources and the Agency of Transportation have been collaborating for years to use asphalt shingles in more and more road projects. ANR is currently working on guidance for SWMEs to comply with requirements to provide collection locations in their regions for recycling shingles and drywall.

For more detail on C&D collection infrastructure, markets, and outreach see the December 2016 [report to the Vermont Legislature: on 10 V.S.A. §6605m Architectural Waste Recycling \(Act 175\)](#).*

E. Tires

ANR estimates that about 625,000 scrap tires are generated each year in Vermont. A 2012 statewide survey identified 62 scrap tire piles, with an estimated 417,000-458,000 problem tires. The Tire Stakeholder group convened in 2015 identified three areas of concern in Vermont: legacy scrap tire piles, ongoing illegally dumping of scrap tires, and lack of recycling markets (see [Report to the Vermont Legislature on Problem Scrap Tire Piles](#) – 2013).

Although ANR believes that most Vermont tires are legitimately managed, the issues identified by the stakeholder group continue to be a concern. A small percentage of scrap tires are illegally disposed, and regional and national markets for scrap tires are weak due to other cheap fuel alternatives. Efforts to identify other national markets are ongoing. Tire Derived Aggregate is going to be used as underdrain for two upcoming VTrans projects, and ANR is in preliminary discussions with VTrans about the possibility of using Ground Tire Rubber Hot Mix Asphalt in future road projects.

F. Textiles

A 2015 stakeholder group on textiles determined that Vermont had been losing some convenient and affordable textile reuse/recycling options, especially in rural areas. While a few textile collectors still serve Vermont, like Goodwill, Salvation Army, and Planet Aid, municipal solid waste managers worry that textile reuse and recycling markets are not strong and remain vulnerable. Textile recycling options in China and Africa are limited, and reuse options are limited by falling quality of textile materials.

From 2014-2017, diversion data reported by solid waste facilities indicates that textiles reuse and recycling has grown steadily.

Year	Tons
2014	248.4
2015	254.3
2016	303.1
2017	369.6

[Data from the 2018 Waste Comp data will be added for the amount of textiles in the trash.]

G. Pharmaceuticals

After passage of the 2016 Act Relating to Combatting Opioid Use in Vermont, the Agency of Human Services, Department of Health has implemented a partial product stewardship program for collecting unused and unwanted prescription drugs. The Department of Health formed a stakeholder group of law enforcement, solid waste professionals, community groups, mental health agencies, environmental groups and others to establish a statewide collection system for unwanted prescription drugs partially funded by prescription drug manufacturers. The Department of Health and its stakeholders continue to manage and evaluate collection to ensure it is sustainable and convenient.

As part of the collection program:

- 21 drug disposal kiosks have been funded throughout the state;
- a law enforcement drug disposal pilot begun in August 2017 has collected over 9,000 lbs of medications and has been extended to 2019;
- a Medication Mail-Back Envelope program was launched in June 2018 making envelopes available at town offices, health centers, libraries, veterinarian offices, and other locations across the state, as well as through the DOH website (see DOH Drug Disposal webpage for further information); and
- outreach and resources are being offered to ensure Long Term Care Facilities are properly disposing of unused medications (based on after a survey to Long Term Care Facilities on their drug disposal procedures).

In addition, a Statewide Sharps Disposal Task Force—formed at the recommendation of the Opioid Coordination Council—has developed statewide best practices for sharps disposal and has launched a pilot project in Barre City. The Task Force is also developing a campaign to educate the public about safe collection and disposal of sharps.

APPENDIX A: Universal Recycling (Act 148) Timeline of Implementation Dates



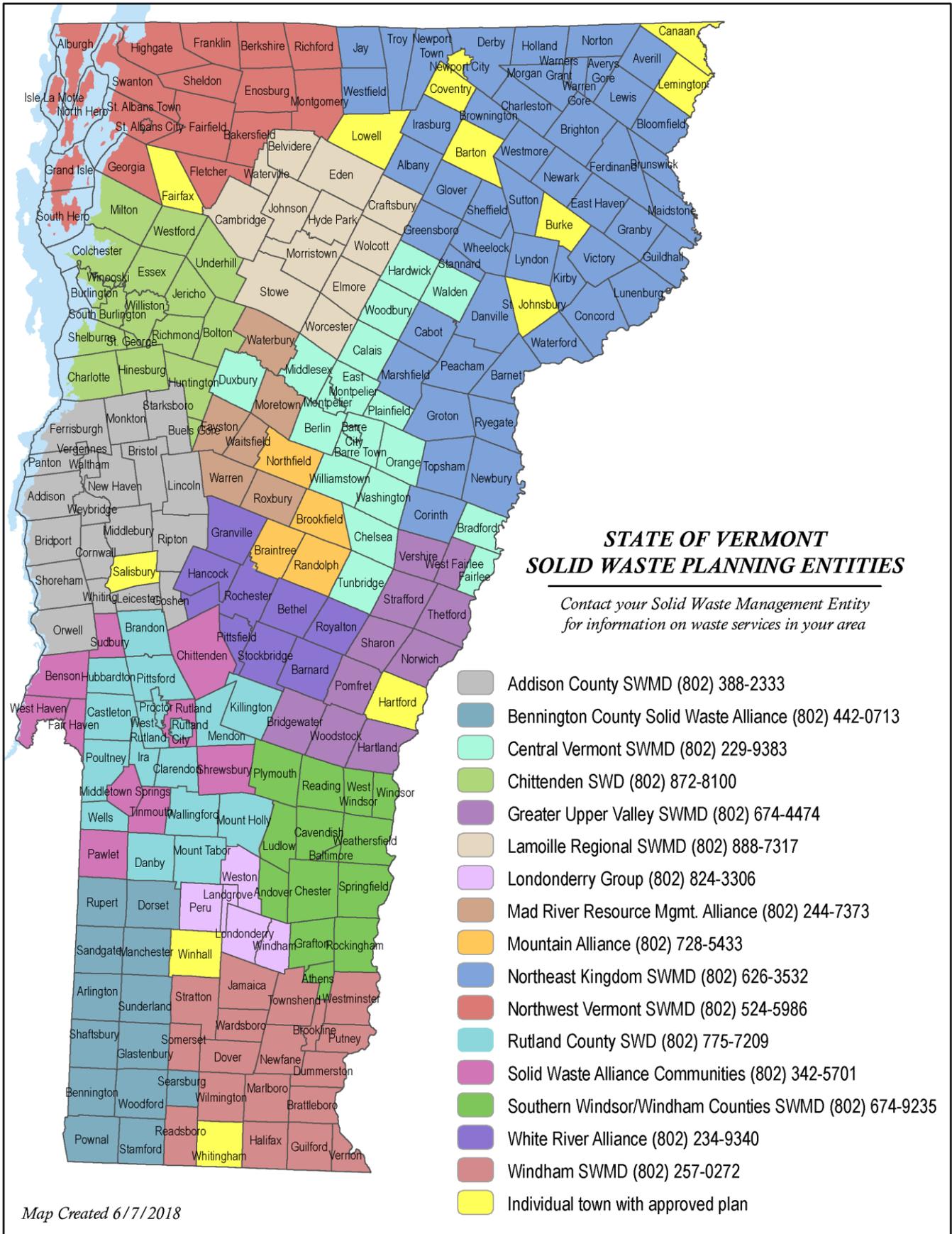
Universal Recycling Law TIMELINE

<p>JULY 1 2014</p>	<ul style="list-style-type: none"> » Transfer stations must accept recyclables » Food scrap generators of 104 tons/year (2 tons/week) must divert material to any certified facility within 20 miles
<p>JULY 1 2015</p>	<ul style="list-style-type: none"> » Statewide unit based pricing takes effect, requiring residential trash charges be based on volume or weight » Recyclables are banned from the landfill » Transfer stations/Bag-drop Haulers must accept leaf and yard debris seasonally (April 1 - December 15) » Haulers must offer residential recycling collection at no separate charge » Public buildings must provide recycling containers alongside all trash containers in public spaces (exception for restrooms) » Food scrap generators of 52 tons/year (1 ton/week) must divert material to any certified facility within 20 miles
<p>JULY 1 2016</p>	<ul style="list-style-type: none"> » Leaf, yard, and clean wood debris are banned from the landfill » Food scrap generators of 26 tons/year (1/2 ton/week) must divert material to any certified facility within 20 miles
<p>JULY 1 2017</p>	<ul style="list-style-type: none"> » Transfer stations/Bag-drop Haulers must accept food scraps » Food scrap generators of 18 tons/year (1/3 ton/week) must divert material to any certified facility within 20 miles
<p>JULY 1 2020</p>	<ul style="list-style-type: none"> » Food scraps are banned from the landfill » Haulers must offer food scrap collection



» For more information, visit www.vtrecycles.com
July 2018

APPENDIX B: Map of Solid Waste Management Entities



APPENDIX C: Hauler Food Scrap Collection Survey

VERMONT AGENCY OF NATURAL RESOURCES SURVEY ABOUT HAULER FOOD SCRAP COLLECTION REQUIREMENT – July 2018

You are invited to fill out this survey regarding food scrap collection. During the spring 2018 session, the Vermont Legislature directed the Vermont Agency of Natural Resources (ANR) to seek input from stakeholders about food scrap collection requirements.

Specifically, the Legislature seeks information on whether food scrap collection should be required based on population, housing type, customer type, route density, or other appropriate criteria.

State law currently requires solid waste haulers to offer collection of food scraps to all commercial and residential trash customers by July 1, 2020. Please note that haulers can subcontract with others to satisfy this requirement.

To complete this survey, please provide your name and affiliation, and then rank the alternatives indicated below. This survey will be open until July 31, 2018.

** Asterix denotes required field*

* Name

* Organization Name

Email Address

* Affiliation

- Hauler
- Solid Waste Management District, Alliance or Town
- Environmental Group
- Other (please specify)

* Please pick your top three choices from the following options by selecting "A" for your first choice, "B" for your second, and "C" for your third choice.

I. Remove Hauling Requirement: Amend statute to remove requirement that all haulers must offer food scrap collection services to all curbside customers by July 1, 2020.

II. Food Scrap Collection by Density: Amend statute to require haulers to only offer food scrap collection services to curbside customers (commercial and residential) within dense areas above 250 households per square mile. This option may result in only certain dense areas of towns being served.

III. Food Scrap Collection only in Designated Towns: Amend statute to require haulers to only offer food scrap collection services to customers (commercial and residential), within specific densely populated towns, such as Bennington, Brattleboro, Bellows Falls, Springfield, Windsor, Hartford and White River Junction, Rutland City and Rutland Town, Middlebury, Vergennes, Shelburne, South Burlington, Burlington, Williston, Essex, Winooski, Colchester, Milton, St. Albans, Swanton, Barre City and Barre Town, Montpelier, Newport City, and St. Johnsbury. With this option, haulers would offer food scrap collection services in each designated town.

IV. Commercial Only: Amend statute to require haulers to only offer food scrap collection services to commercial customers, defined as businesses or institutions that generate food residuals.

V. Commercial and Multi-Residential Units: Amend statute to require haulers to only offer food scrap collection services to commercial customers, defined as businesses or institutions that generate food residuals, and multi-unit residential customers, defined as apartment buildings or condos of 3 or more units.

VI. Hauler Exemption: Amend the Hauler Exemption in statute to allow haulers to be exempt from offering curbside food scrap collection services when other food scrap haulers are present and willing to offer food scrap collection services to customers in that hauling area. This exemption would not require the SWIP process.

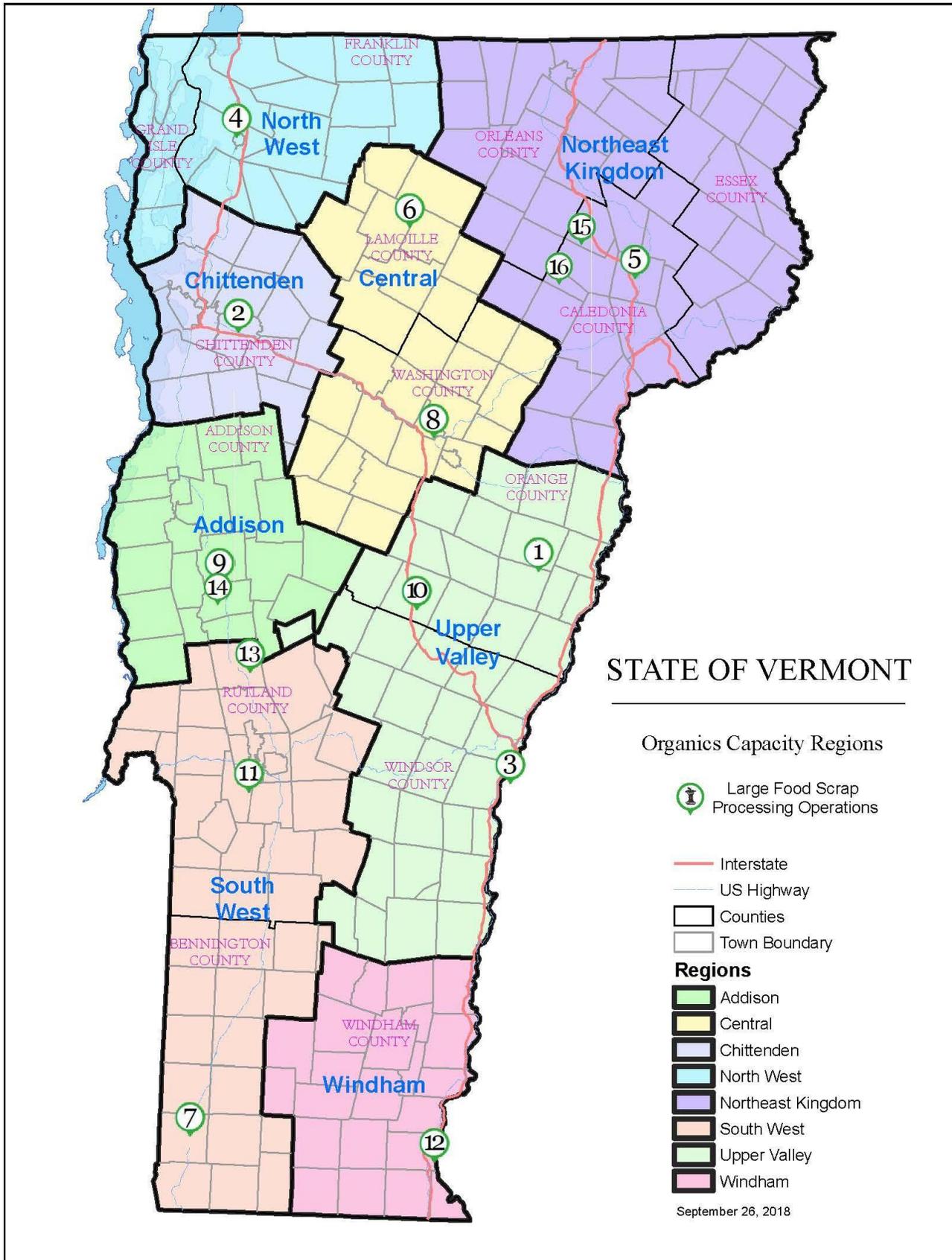
VII. Keep Hauling Requirement: No change to statute. Maintain the requirement that all haulers must offer curbside food scrap collection services to customers they provide trash collection services to by July 1, 2020 or subcontract with another hauler for these services.

VIII. Unsure: I would like to have another meeting to discuss options.

IX. Other

If you selected "Other", please describe:

APPENDIX D: Organics Capacity Regions Map



Food Scrap Processing Operations Mapped on Appendix D

1. Cookeville Compost
2. Green Mountain Compost
3. Grow Compost
4. Hudak Farm
5. Kingdom View Compost
6. Lamoille Soil
7. TAM Organics
8. Vermont Compost Company
9. Vermont Natural Ag. Products
10. VTC Digester
11. Casella Organics Recovery Facility
12. Windham SWMD Compost Facility
13. Wyman Frasier Compost Facility
14. Salisbury Digester
15. Cloud's Path Farm
16. Black Dirt Farm

APPENDIX E: Bottle Bill Exemption Criteria Recommendation

**Guidance on Eligibility to Qualify for the Retailer Exemption
from Beverage Container Redemption under 10 V.S.A. § 1523b****Draft** September 13, 2018

Under statute 10 V.S.A. §, 1523, retailers of beverages covered in Vermont’s beverage redemption law must accept for redemption any containers of a kind, size, and brand sold by that retailer, unless they have prior approval from the Secretary exempting them from this requirement.

In accordance with 10 V.S.A. § 1523(b), for retailers to be exempt from this requirement to redeem beverage containers, the Secretary would need to make the following finding:

A redemption center or centers are established which serve the public need.
[See, 10 V.S.A. § 1523b]

The following are proposed criteria to be included in a new procedure that the Secretary would use to evaluate exemption requests:

1. *Exemption will be granted if there is an alternative redemption location within 5 miles of the retailer.*
2. *Exemption may be granted if there is an alternative redemption location within 10 road miles of the retailer or demonstrably within the current shopping patterns of community members.*
3. *Program considerations when reviewing exemption requests include the following:*
 - i. *Type of proposed alternate redemption location – acceptable locations must be a certified redemption center or retailer served by TOMRA pick-up (or other third-party pick-up agent)*
 - ii. *Volume of retailer’s sales and proximity to larger volume retailers*
4. *Retailers must apply for exemption—it is not automatic based on exemption criteria.*
5. *Once exemption is granted, retailers are encouraged, for the convenience of their customers, to post exemption status along with alternate redemption location address and contact information.*
6. *Exemption will remain in effect only so long as the designated alternate redemption location continues to operate as a certified redemption center or be served by TOMRA (or other third-party pick-up agent).*

APPENDIX F: Report Responsiveness Summary