

BIENNIAL REPORT ON SOLID WASTE

1987 Act 78, 10 V.S.A. §6604(b)

Submitted to the
House and Senate Committees on Natural Resources and Energy

Agency of Natural Resources
Department of Environmental Conservation



January 3, 2017

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I. EXECUTIVE SUMMARY

Act 78 Reporting Requirements

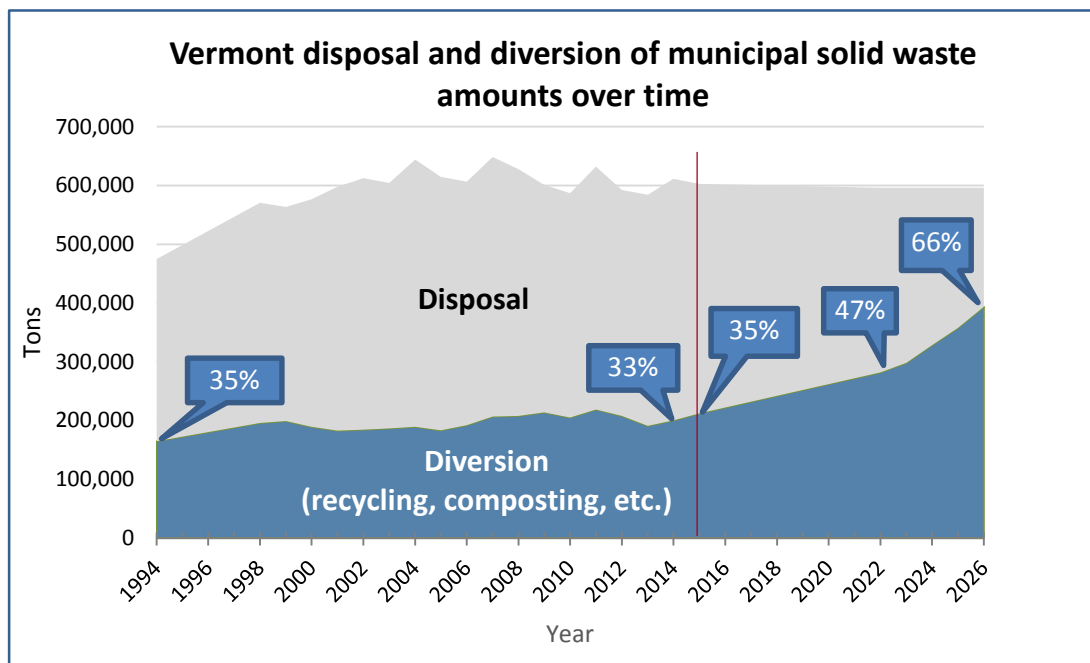
This report is submitted in compliance with Act 78 (10 V.S.A. 6604(b)), enacted in 1987. The Vermont General Assembly charged the Secretary of the Agency of Natural Resources (ANR) with submitting a report every biennium regarding the volume, amount, and toxicity of the Vermont’s solid waste stream. In preparing the report, the Agency must hold public hearings, conduct analyses, and make recommendations to the House and Senate Committees on Natural Resources and Energy. In making recommendations, the Secretary is directed to consider both legislative and voluntary mechanisms for reducing waste, and to post the draft report for 45 days. In compliance with legislative mandate, a draft of this report was posted for 45 days prior to filing with the Legislature.

Act 78 represented the first comprehensive solid waste law adopted in Vermont. Disposable products and packaging had become prevalent and oversight of the toxicity of the packaging materials was just developing. Manufacturing for recyclability at that time was an emerging concept. Reflecting its time, the Legislature targeted chloride and polyvinyl chloride packaging, polystyrene packaging, products and packaging that may contain heavy metals, and unnecessary packaging that is nonrecyclable or nonbiodegradable. In the years since, Vermont has enacted several extended producer responsibility programs, including Universal Recycling and stewardship programs for mercury-containing lamps and thermostats, electronics, paint, and batteries.

Over the past two decades, the amount of waste disposal has fluctuated more drastically than the level of waste diversion (recycling, composting, etc). Within the past 10 years, after several stakeholder groups, legislative reports, contracted studies, and newly adopted legislation, the Department of Environmental Conservation (DEC) a department within ANR has initiated several new programs to reduce overall volume of material sent to the landfill as well as the degree of toxicity of the materials that may be discarded through the municipal solid waste system. As a result:

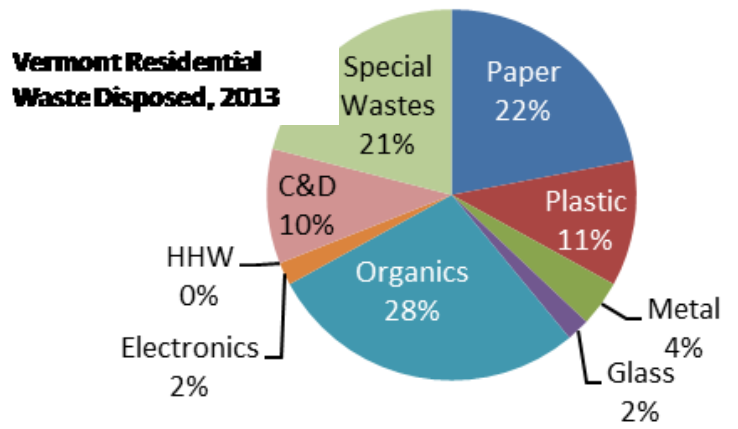
- Trash disposal throughout the state decreased 5%;
- Vermont’s recycling & composting rate has increased from 33% to 35%;
- Food rescue has grown by nearly 40%, according to the Vermont Foodbank; and
- More Vermonters have access to recycling collection than ever before.

The chart below is a snapshot of the fluctuations in disposal amount compared to that of diversion. With full implementation of programs such as the Universal Recycling law, DEC anticipates a rapid and significant increase to diversion rates, as projected in the graph below.



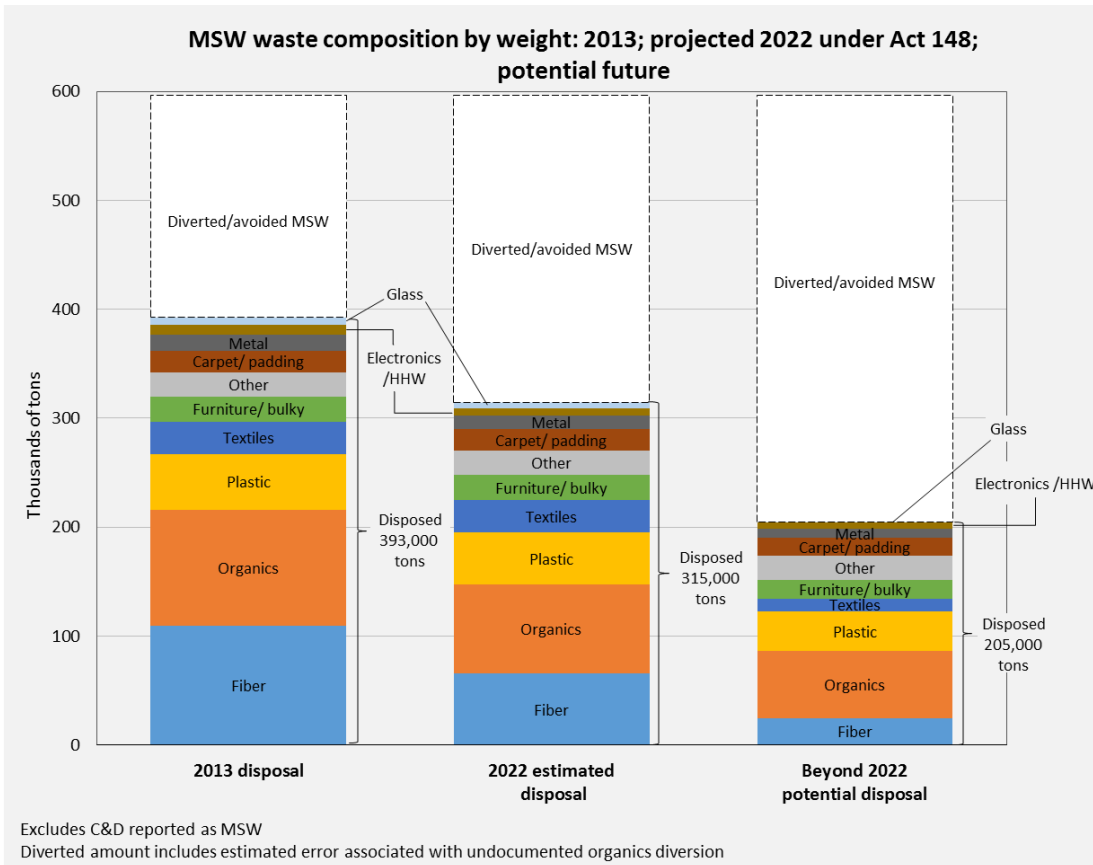
New State Diversion Forecast

The 2012 passage of the Universal Recycling Law (Act 148) (UR) addressed the concern that too much of Vermont’s waste was being landfilled rather than diverted for more beneficial uses. At that time the state’s diversion rate had stalled between 30 – 36%. A statewide 2013 [Waste Composition Study](#) showed that approximately half of the materials placed into landfills are a broader range of recyclables, leaf and yard debris, and food scraps that could be diverted and put to better use. When placed in a landfill, these materials (especially food scraps) pollute the air by producing methane, a potent greenhouse gas. The data from this study is based on 2011 Diversion and Disposal reports, reflecting baseline tonnages prior to adoption of the UR law.



The UR law encourages diversion of materials from the landfill by phasing out certain materials (mandated recyclables, food scraps, clean wood, and leaf and yard debris) from landfills, ensuring parallel collection (collection of these materials at the same location as trash collection), adhering to a food recovery hierarchy, and incentivizing diversion through variable rate pricing (commonly defined as “pay-as-you-throw”).

Nearly 50% of what Vermonters throw away could be recycled, donated to feed people in need, or composted.



With passage of Act 148, a new Materials Management Plan (MMP), and several new product stewardship programs, DEC anticipates achieving a 47% diversion rate by 2022. DEC anticipates the diversion rate to climb to 66% as material specific programs are implemented. This may be achieved through new programs to capture packaging and printed materials as well as textiles, carpet and padding, and bulky items.

Recommendations

Fully Implement Existing Legislation - The Department of Environmental Conservation (DEC) recommends that the Vermont Legislature continue to support the existing laws adopted to prevent, mitigate and divert materials from our primary landfill, and to extend sunset provision for collection of mercury auto switches.

Increase Household Hazardous Waste & Construction/Demolition Debris Diversion - DEC recommends increased efforts to address household hazardous wastes (HHW) and construction and demolition (C&D) debris. Over the next year DEC will work with stakeholders to identify new opportunities for funding collection of HHW and new ways to manage HHW. DEC will also continue to work with C&D stakeholders on Act 175 implementation.

Explore Diversion of Other Materials – Over the next two years DEC anticipates convening a stakeholder group to explore potential solutions to offer convenient collection, decrease disposal, and encourage sustainable packaging, paper and printed material production. Other priority materials include tires, textiles and plastic bags.

II. LAWS & PROGRAMS TO REDUCE TOXICITY & QUANTITY OF MATERIALS IN THE WASTE STREAM

This section of the report summarizes the various Vermont laws and regulations that govern solid waste disposal in Vermont and seek to improve the state’s disposal and diversion rates.

A. Universal Recycling Law

In 2012, the Legislature unanimously adopted the Universal Recycling law (Act 148), an “act relating to establishing universal recycling of solid waste,” to address the stalled rate in Vermont of waste diversion (30 – 36%) over the past decade. The goals of the Universal Recycling law are to improve the capture and diversion rates and to prevent valuable materials from being landfilled. By phasing out landfilling of certain materials (mandated recyclables, food scraps, clean wood, and leaf and yard debris), ensuring parallel collection (collection of these materials at the same location as trash collection), and incentivizing diversion through variable rate pricing (commonly defined as “pay-as-you-throw”), policy tools were set in place to discourage waste generation and disposal.

The Universal Recycling law emphasizes choice and convenience to Vermont residents and businesses, leading to more consistent materials management services, such as recycling and composting, statewide. By requiring separation and diversion of materials (mandated recyclables, clean wood, leaf and yard debris, and food residuals), the law incentivizes a renewed effort to invest in materials management strategies. A phased-in design of the law was adopted to allow time to establish collection services and processing facilities for managing mandated recyclables and food, leaf, and yard materials. See Appendix A.

MATERIAL	FACILITIES	HAULERS	LANDFILL BAN
Recyclables	2014	2015	2015
Leaf/Yard Waste	2015	2016	2016
Food Scraps	2017	2017	2014-2020
Clean Wood			2016

Universal Recycling Law - Required Collection & Landfill Ban Implementation Dates

Implementation milestones were designed to make recycling and composting as easy as trash disposal. The legislation also required municipalities to adopt variable rate pricing structures (often called Pay As You Throw). These pricing systems must be based on

either a per unit of weight or volume basis. While many towns and haulers were already using this type of pricing, the legislation has led to adoption of town ordinances that require weight or volume based pricing statewide.

Through implementation programs and outreach campaigns, in 2015 DEC saw a 5% reduction in the amount of municipal solid waste disposed from Vermont. This is a significant accomplishment considering that waste typically doesn't decrease other than during times of recession and economic downturn. Refer to the *Vermont's Universal Recycling Law – Status Report 2016* for more details.

DEC set a goal in the Materials Management Plan to increase the statewide diversion rate of trash from approximately 30-36% to approximately 50% with full implementation of the Universal Recycling law requirements.

B. Materials Management Plan

As mandated by Vermont law (10 V.S.A. § 6604), “the secretary [of the Agency of Natural Resources] shall publish and adopt, after notice and public hearing..., a solid waste management plan which sets forth a comprehensive statewide strategy for the management of waste...” The statutory language also requires that the Plan be revised at least once every five years. In 2014 the Agency adopted the “Vermont Materials Management Plan” in accordance with statutory requirements of 10 V.S.A. § 6604 which serves as the state’s latest solid waste management plan. For purposes of moving towards a sustainable materials management vision and away from an end-of-pipe “waste” management system, the Secretary of the Agency of Natural Resources changed the name from the Solid Waste Management Plan to the “Materials Management Plan” to recognize that materials we no longer need have value (e.g. metal cans for steel “I” beams, food scraps for compost, etc.).

Through the MMP performance standards supported by stakeholders and adopted through rulemaking, DEC seeks to reduce the disposal rate of municipal solid waste (MSW) by 25% from 413,517 tons to approximately 306,772 tons by end of the Plan term, in 2019. To track progress towards attaining this goal, DEC compiles data reports annually from certified facilities to estimate the annual diversion and disposal rates.

This MMP was designed to develop programs and offer services that will guide the reduction of the amount and toxicity of solid waste in Vermont. Clear and definitive performance standards for both the state and local solid waste management entities (SWMEs) provide benchmarks to measure progress toward achieving MMP goals for each of five material streams: recyclables, organics, construction and demolition debris, household hazardous waste, and biosolids. Within each category, performance standards establish expectations for outreach and education and convenience to support a waste reduction system that not only creates awareness among residents and businesses, but ensures that recycling, composting, donation, and other diversion options are readily accessible.

Municipal Solid Waste Goals

The MMP sets two goals—one being the disposal rate goal and the other being the diversion rate goal—for the state to use to measure its success with waste reduction and diversion (recycling, composting, etc.).

Vermont aims to reduce the disposal rate of municipal solid waste (MSW) by 25% from 413,517 tons to approximately 306,772 tons by 2019.

Disposal Rate: The MMP sets the goal for the state to reduce the disposal rate of municipal solid waste (MSW) by 25% from 413,517 tons to approximately 306,772 tons by end of the 5-year Plan term. The per capita disposal rate of MSW will be reduced from the current 3.62 lbs. per person per day to 2.69 lbs. per person per day. This will be achieved through implementation of the Universal Recycling law and a variety of new and existing efforts designed to educate and to offer services to Vermont citizens and organizations in the proper management of materials.

Diversion Rate: The MMP sets a second goal to increase the statewide diversion rate of all MSW from approximately 30-36% to approximately 50% with full implementation of the Universal Recycling law requirements and other MMP programs in 2020. The “diversion rate” is the amount of material diverted (by composting, reusing, and recycling materials), divided by the sum of waste diverted and waste disposed (at disposal facilities, landfills and incinerators). Materials used for alternative daily cover at landfills do not constitute materials diverted from the landfill. Achieving this 50% diversion goal will require increased separation, recycling, food donation, and composting of recyclables and organic materials (food scraps/leaf & yard debris). The remaining 50% of the waste stream was addressed through a “[Beyond Waste](#)” stakeholder process. DEC hopes that full implementation of Vermont’s Universal Recycling law, coupled with Beyond Waste efforts, will achieve diversion rate increases to 66%.

Combined, the diversion and disposal rate tonnages result in the MSW generation rate. . Tracking the fluctuations of Vermont’s generation rate is a metric that DEC is able to use to assess waste reduction. DEC promotes the reduction of the amount of waste being disposed along with increase is the amount being diverted, while at the same time, a decrease in the overall generation rate of materials.

Solid Waste Implementation Plans (SWIPs)

By law municipalities, DEC refers to as Solid Waste Management Entities (SWMEs), are ultimately responsible for solid waste and materials management. State law requires that SWMEs manage solid waste within their jurisdiction in conformance with the state solid waste management plan, now called the Materials Management Plan (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). This is the first time the Agency has obtained full SWIP compliance, which it attributes to a clear and streamlined SWIP approval process, weeks of guidance, meetings and direct one on one assistance to towns, and collaboration between solid waste districts, alliances of towns, and independent towns. Of the 27 SWMEs operating in Vermont, as of November 2016, 10 were chartered solid waste districts, 6 were groups or alliances of towns with formal partner agreements, and 11 were independent towns. *Appendix B* reflects the current map of the SWMEs operating in partnership or independently from each other.

All 27 municipal entities charged with meeting the performance standards of the Materials Management Plan, have each adopted an approved Solid Waste Implementation Plan. That 100% compliance rate will benefit all Vermont businesses and residents.

The updated MMP was intentionally designed to drive measurable action on the part of DEC and the SWMEs. Many ambitious goals are embodied within the MMP, but it is the baseline expectations captured by performance standards of each material chapter, that set the tone. To drive awareness and diversion, the performance standards fall into two

categories, relating first to outreach and education (such as schools and businesses), and second to ensure convenience for collection exists within each SWME or region. Using results based accountability measurement structures, coupled with annual reporting requirements from each SWME, gives the opportunity for DEC to confirm that the commitments made in the SWIP are being executed for each of the material types. Moving the MMP away from a planning document to one that is action oriented, has had the effect of encouraging partnership development and resource sharing between the SWMEs. One specific driver of this partnership has been the performance standards tied to establishing collection events or permanent collection facilities for household hazardous waste (HHW).

Targeting Toxicity in the Waste Stream

Although HHW is exempt from state and federal regulation as “hazardous waste”, Vermont statute requires the Solid Waste Program to address the volume and toxicity of the waste stream. Since the early 1990s SWMEs in Vermont have been required to include provisions in their Solid Waste Implementation Plans (SWIPs) for the management of this household hazardous waste as “unregulated hazardous waste.” Collecting and managing HHW can be expensive, yet is important to remove the toxics and hazards from the waste stream. Toxics can pose hazards to human health and the environment if not collected and restricted from potential release. To assist with this expense, DEC has issued more than

\$400,000 in grants on an annual basis since 2007 to the SWMEs to assist with the costs of HHW collection and SWMEs must cover the remaining costs for managing these materials. Even with the financial grants provided by DEC, the cost of collecting and managing HHW is expensive and requires additional financial resources from the SWMEs.

Household hazardous waste and conditionally exempt generator (CEG) hazardous waste is collected and managed at several fixed, full-time facilities in the state and at numerous collection events hosted by municipalities throughout the year. A total of 752.1 tons of combined HHW and CEG materials were collected in 2014, a 43% increase over the 525 tons collected in 2013. The factors leading toward increased collection volumes in 2014 may include the success of the first year of the Vermont PaintCare program, a product stewardship initiative, and improved HHW/CEG reporting from municipalities.

Summary of historic hazardous waste collections and participation

	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total HHW and CEG tons collected	752	525	460	467	489	566	436	444	521
% participating VT households (avg.)	6%	7%	9%	7%	6%	8%	9%	7%	6%
Pounds collected per household (avg.)	102	62	34	47	46	45	30	39	44

C. Landfill Disposal Bans

In Vermont, landfill bans are in place on rechargeable batteries, lead acid batteries, certain banned electronic devices, motor oil, paints, and mercury-added lamps, thermostats, and other products listed under 10 V.S.A. §6621a. Banned electronic devices include computers, peripherals, monitors, cathode ray tubes, televisions, printers, personal electronics such as personal digital assistants and personal music players, electronic game consoles, fax machines, wireless telephones, telephones, answering machines, VCRs, DVD players, digital converter boxes, stereo equipment, and power supply cords used for charging.

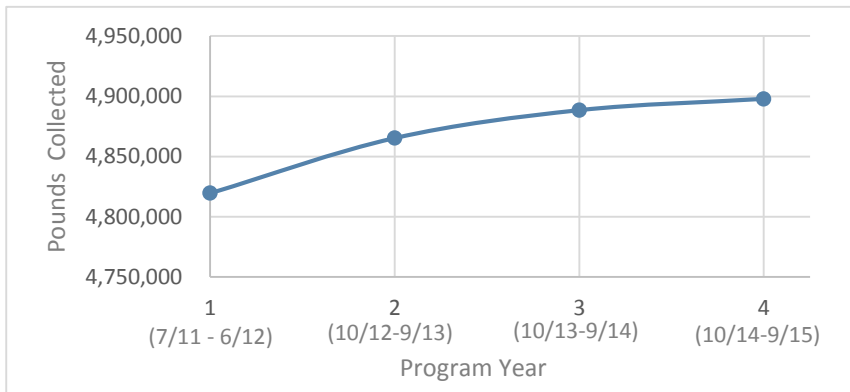
There are also landfill bans on non-hazardous materials, such as tires and household appliances such as refrigerators, washers, and stoves. Vermont’s UR law expands the landfill ban list to include mandated recyclables (aluminum and steel cans, glass bottles and jars, plastic bottles and containers PET and HDPE, cardboard and paper); leaf, yard and clean wood debris; and food scraps by July 1, 2020. Other potential landfill bans for both non-hazardous and hazardous containing products are evaluated based upon information from 2013 Waste Composition Study and the availability of cost effective and convenient options for collection, recycling, and safe end-of-life handling of these materials. Additionally, materials may also be targeted to minimize the amount of material being sent to the landfill. Several categories of material were considered by the [Beyond Waste Advisory Group](#) in 2015 and DEC held subsequent material specific stakeholder groups for tires, textiles, and construction and demolition debris as a result.

D. Extended Producer Responsibility Laws

The extended producer responsibility (EPR) laws, also referred to as “take back” programs, described below have been adopted within the last 10 years. These laws mitigate environmental impact from disposal, and share the cost of diversion with the manufacturer and the consumer to alleviate financial burden on municipalities.

1. Electronics Recycling

Number of pounds of covered electronics collected per program year



Electronic waste (E-waste) is a growing and problematic waste stream that contains toxic materials (such as lead, mercury, and chromium), valuable materials such as precious metals, recyclable plastics, and metal like steel and aluminum. Yet as late as 2009 there was no consistent and convenient means of capturing E-waste throughout Vermont.

The Vermont legislature passed the E-waste law “Collection and Recycling of Electronic Devices” in 2010 resulting in the creation of

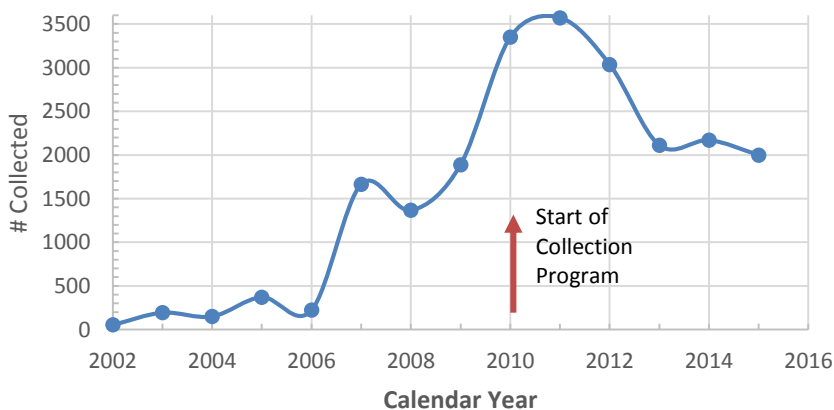
the Vermont E-Cycles Program that started operations in 2011. The goal of the Program is to provide free and convenient collection and recycling of TVs, computers, monitors, and printers. Like other product stewardship programs, the costs of this electronics recycling program are borne by the manufacturers that sell these electronic devices in Vermont.

Despite challenges to the E-Cycles Program from volatile recycling markets, the amount of material recycled has increased slowly and steadily from 4.8 million pounds to 4.9 million pounds. The Vermont E-Cycles Program is considered one of the most convenient and effective electronics recycling programs in the country and reports the highest per capita collection rate in nation.

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

Mercury Thermostats

Number of mercury-containing thermostats collected per year



Mercury (Hg) is one of the most widespread, persistent, and toxic contaminants in our environment. Its incorporation into many products and its emission from combustion processes has resulted in well documented instances of population poisonings, high level occupational exposures, and worldwide, chronic, low-level environmental exposures. Even a small amount of mercury can damage our lakes and streams and poison fish and wildlife. It is because of mercury’s toxicity that restrictions (limits) have been placed on how and where mercury-added products

are disposed. Vermont has addressed mercury elimination through its Mercury Education and Reduction Campaign (MERC), which have included thermometer exchanges, school clean-outs, retailer and contractor mailings, dairy manometer exchanges, pharmacy pledges and various other outreach efforts to remove mercury from the solid waste stream.

To address mercury-containing thermostats, legislation was passed in 2008 requiring thermostat manufacturers to establish a mandatory collection program that provides residents and contractors with a \$5.00 rebate incentive for each mercury thermostat collected in the state. The Thermostat Recycling Corporation (TRC) manages this program on behalf of mercury thermostat manufacturers and each year reports to DEC the total mercury thermostats collected from over 160 retail, household hazardous waste, and wholesale collection locations across the state.

According to the 2015 TRC report, 14.23 pounds of mercury were collected from a total of 2,000 thermostats. This is a significant decrease from the 3,349 thermostats collected in 2010, and a decrease of 8% from 2014 numbers. To-date much of the outreach efforts by TRC have been targeted solely to wholesalers and distributors, though they represent only about 25% of the total volume collected in Vermont this past year.

The thermostat legislation sets a target goal of 65% of thermostats available for recycling to be collected by the program. The state is working with TRC to bring the collection numbers up by requiring them to expand outreach efforts to the general population and heating contractors, highlighting the \$5.00 incentive. Additionally, DEC has requested TRC to increase oversight efforts and direct contact with each collection site. It is anticipated that these increased efforts will raise awareness of the program to increase collection numbers in Vermont. Next year's report and totals will be assessed to evaluate TRCs overall effectiveness going forward and any future modifications that will need to be made to increase collection numbers.

Mercury Auto Switches

Mercury auto switches have been phased out in newer model cars, resulting in fewer and fewer mercury switches that need to be properly managed.

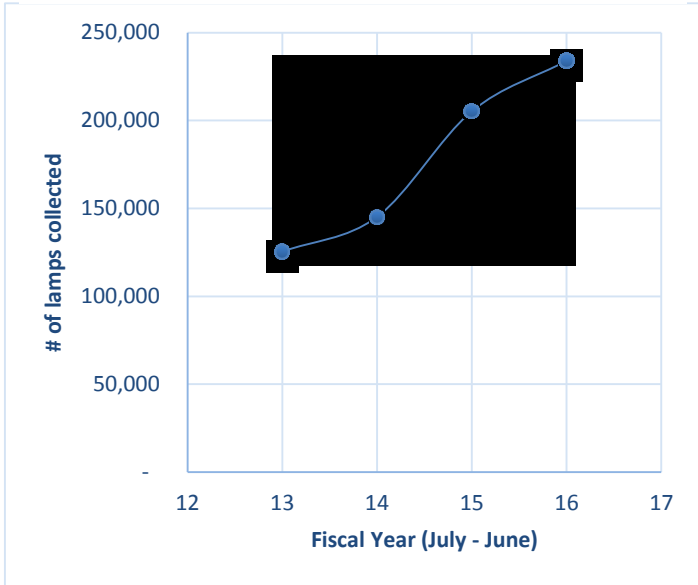
Mercury contained in auto switches can be emitted to the environment when vehicles are crushed, shredded, and then smelted to produce new steel. The primary source of this mercury is hood and trunk "convenience light" and "anti-lock brake" switches used in some vehicles until Model Year 2003. Mercury emissions from steel manufacturing plants that process scrap steel from vehicles is listed as the third largest source of mercury emissions in the U.S. in the 2013 Toxics Release Inventory. Foreign processing of scrap metal exported from the U.S. also emits mercury.

All 50 states, the USEPA, the regulated community, environmental groups, and other stake holders have developed and are implementing the National Vehicle Mercury Switch Recovery Program (NVMSRP) through a Memorandum of Understanding (MOU), to remove mercury switches from end-of-life vehicles and thereby reduce mercury emissions.

The NVMSRP is scheduled to sunset at the end of 2017 but may be extended another four years. Vermont statute requires motor vehicle recyclers to remove mercury auto switches prior to crushing/shredding. Similar to NVMSRP, Vermont's "mercury added motor vehicle components" legislation is scheduled to sunset at the end of 2017. DEC recommends that the sunset provision for 10 V.S.A. §7108 be extended for a minimum of four years, or to reflect the NVMSRP extended timeframe that is likely to be chosen.

In the meantime, the DEC will work with the salvage yard program to send letters to all permitted salvage yards to remind them of the requirement to pull mercury switches, to provide information about how to manage the switches, and to collect information about how many switches they collect annually.

Number of mercury-containing lamps collected per year



Mercury Lamps

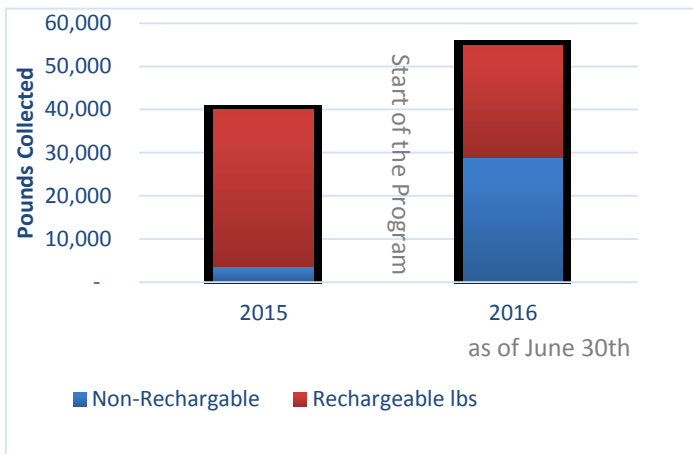
Mercury is a highly toxic heavy metal that is released into the environment when mercury-containing lamps are broken or discarded. Although lamps contain a relatively small amount of mercury, the high volume of spent lamps generated in fluorescent lamps (linear and compact fluorescent) and high intensity discharge (HID) lamps warrants proper recycling options be made available. HID is a term used to describe mercury vapor, metal halide, and high pressure sodium lamps.

Spent mercury-containing lamps, whether generated by businesses or households, cannot, by law, be disposed in the trash, and are collected throughout the state to be recycled. Spent lamps generated by businesses and institutions are subject to Universal Waste Management Standards contained in the Vermont Hazardous Waste Management

Regulations (VHWMR) (Subchapter 9). Vermont’s manufacturer-funded lamp recycling program is managed by the National Electrical Manufacturers Association (NEMA) was implemented in July of 2012 under a five-year collection plan approved by the state. Each year for the past four years the number of mercury-containing lamps collected in the state has steadily increased. During the July 2014-June 2015 period 205,155 lamps were collected while the July 2015-June 2016 period saw an increase to 233,820 lamps collected. Having free and convenient collection locations offered statewide by SWMEs and various retailers benefits Vermonters seeking to properly recycle mercury-containing bulbs.

3. Primary Batteries

Pounds of batteries collected



In 2014, Vermont became the first state to require manufacturers to fund recycling of single-use batteries, with the passage of the Vermont Primary Battery Stewardship Law. The law requires producers of primary batteries (non-rechargeable batteries) sold in Vermont to register with Vermont Department of Environmental Conservation (DEC) and provide a stewardship plan to manage the proper recycling and/or disposal of primary batteries sold in Vermont. A Primary Battery is a non-rechargeable battery weighing two kilograms or less, including alkaline, carbon-zinc, and lithium metal batteries. Producers may choose to submit an individual stewardship plan or participate in a shared stewardship plan. Currently, most producers who sell in Vermont are under a shared stewardship plan which is implemented by the stewardship organization [Call2Recycle](#).

Call2Recycle implements both the primary (non-rechargeable) battery stewardship program mandated by Vermont law and the manufacturer-led voluntary rechargeable battery collection program. This allows for both types of batteries to be collected at no cost to consumers in Vermont in convenient locations throughout the state. There are 135 collection sites available in Vermont for battery recycling which offers 96% of Vermont residents and businesses access to a collection site within 10 miles of their home or business. The stewardship program is funded by battery producers who pay fees based upon their Vermont sales.

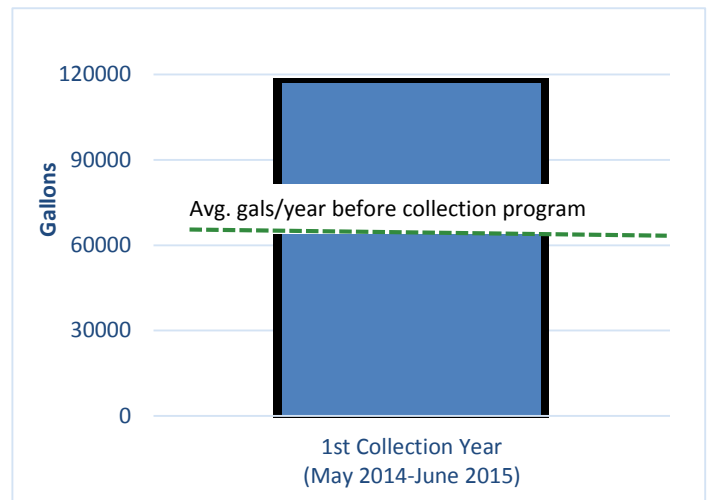
The collection program began January 1, 2016 and has already collected 28,612 pounds of primary batteries and 26,047 pounds of rechargeable batteries as of June 1, 2016. This past June—six months after the law went into effect—single-use battery collections were up 2,947% over 2015. Even rechargeable battery collections were up 29% year over year.

Part of the program’s success is due to the work of Vermont’s solid waste management entities who have partnered with Call2Recycle to organize collection at their transfer stations, towns offices, local retailers and special collections.

4. Paint

The Vermont Paint Stewardship Law was signed on June 3, 2013. The law requires producers of architectural paint sold in Vermont to register with DEC and provide a stewardship plan to manage the proper recycling and/or disposal of architectural paint sold in Vermont. Architectural paint is defined as interior and exterior architectural coatings that are sold in containers of five gallons or less. Producers may choose to submit their own individual plan or participate in shared a stewardship plan. All manufacturers of architectural paint who sell paint in Vermont participate in an approved paint stewardship plan implemented by the stewardship organization [PaintCare](#).

Number of gallons of paint collected per year



This stewardship program is funded by paint manufacturers that pay a fee on each container of paint sold into the State. The fee is used by the paint stewardship organization, PaintCare to pay for the collection, transportation and disposal or recycling of unwanted post-consumer architectural paint in Vermont. The fee is passed down to the retailer and consumer

Since the collection program began May 1, 2014, [PaintCare](#) has established 72 year-round collection sites in addition to working with the existing seasonal Household Hazardous Waste events which has resulted in 99.5% of Vermont residents and small businesses having access to a drop off site within 15 miles of their home or business. PaintCare through partnerships with retailers, towns, waste haulers and solid waste management entities have collected 116,961 gallons of paint. This is almost double the approximately 60,000 gallons per year of paint that was collected in Vermont prior to the paint stewardship program being implemented starting May 1, 2014.

E. Construction & Demolition Debris

In 2014 the Vermont Legislature adopted Act 175 to divert construction and demolition debris (C&D) for six material types from large projects across Vermont, when a C&D recycling facility is within 20 miles to accept the materials. Those materials types include metal, clean wood, asphalt shingles, drywall, and oriented-strand board and plywood.

In response to recommendations by the [Beyond Waste Advisory Group](#) and Act 175, a stakeholder group convened in the fall of 2015. The objective of the group was to develop policies or legislative direction to reduce the amount of C&D waste generated and to increase the diversion of these materials to beneficial reuses and recycling markets. Refer to the [Report to the Vermont Legislature: on 10 V.S.A. §6605m Architectural Waste Recycling \(Act 175\)](#) for more detail on infrastructure for collection, markets for materials, and outreach to impacted parties.

F. Bottle Bill

Beverage container deposit legislation, known as Bottle Bill, has existed for close to a half century. Generations of Vermonters have grown up redeeming beverage containers for a nickel or for fifteen-cents depending on the contents. Following adoption of the Universal Recycling law in 2012, DEC commissioned a report to assess the impact of implementing the law. A portion of that study, known as a Systems Analysis of the Impact of Act 148 on Solid Waste Management in Vermont, was to review the Bottle Bill system. That report estimated a 75% recovery rate for containers sold and redeemed in Vermont. The high recovery rate does not come without expense or challenges.

Glass is an example of one of the challenges. For the material recovery facility (MRF), keeping glass clean and free of contaminants is difficult. Glass is easily contaminated by paper, metal and plastics that it is often comingled with in the single stream collection system prior to separation at the recycling facility. Glass processed through the Bottle Bill system is often separated manually at redemption centers or crushed separately from other material types leaving a cleaner product. The single stream collection system for recyclables results in glass being an expense for the MRF rather than a source of revenue in many cases. The Bottle Bill system reduces this some by capturing deposit covered glass beverage containers which can lower processing costs for the MRF.

III. BEYOND WASTE MATERIALS

With the passage of the Universal Recycling law, the state aims to increase recycling and reuse statewide, reaching 50% diversion of municipal solid waste by 2022. Of the remaining 50% or so disposed is comprised of materials that are difficult or less convenient to reuse or recycle. The MMP committed to initiating a process by which stakeholders would be convened to evaluate materials that do not fall under the disposal bans adopted under the Universal Recycling law.

In response to this remaining 50% of the waste stream, a “Beyond Waste Advisory Group” was convened in the fall of 2014. Materials recommended by the Beyond Waste Advisory Group for additional individualized management strategies were chosen because of their high volume within the waste stream or their hazardous nature, and therefore pose the greatest risk to, or stress on, Vermont’s waste (materials) management system and natural resources. The four material types prioritized included textiles, tires, construction and demolition debris, and HHW, oil and oil filters, and a second tier of priorities as pharmaceuticals, plastic film and agricultural plastic, and Paper, Printed material, and Packaging.

Matrix of criteria for evaluating prioritization of material type for further stakeholder review

Categories & Criteria	Sub Criteria
Characteristics of Material	
Environment & Human Health	Product toxicity and potential impact on human health and the environment, including GHG emissions
Value	Inherent value in the material; existing markets and potential of the market to expand
Recyclability	Able to be recycled, reprocessed or repurposed
Volume	Impact on existing landfill capacity; amount currently diverted. Weight is often used as a proxy because volume data is difficult to collect. Though there are instances where low weight high volume materials impact landfill capacity
Existing Infrastructure	
Low Recovery Rate	Material reflects a low recovery, or diversion rate
Opportunities to Expand Existing Programs	Opportunity exists to improve under-performing programs; access to programs is low; importance of assessing program effectiveness; and existing recovery rate
Infrastructure Readiness	Collection and processing logistics
Cost	Cost to consumers, manufacturers, municipalities all effect diversion rates. Is there a more costs effective way to handle the material and maintain a high diversion rate

A. TIRES

Approximately 300 million scrap tires are generated each year in the United States, or about one scrap tire per person per year. Using this the United States Environmental Protection Agency (USEPA) and industry accepted metric, DEC estimates about 625,000 scrap tires are generated each year in Vermont. To verify the amount of scrap tire piles DEC undertook a statewide survey in 2012.

The findings from that survey reflected that a total of 62 individual scrap tire piles were identified in the inventory reported. Unless field verified by DEC staff, the size of the individual tire pile was represented by a range: an estimate of the quantity provided by the person who reported the pile. Utilizing the lowest number of each range of the unverified piles, in addition to the field verified quantities, yields a cumulative estimate of 417,000 problem tires. Utilizing the highest number of each range of the unverified piles, in addition to the field verified quantities, yields a cumulative estimate of 458,000 problem tires.

Range of Tires in Pile	# of Tire Piles
Quantity not reported or verified	5
100-200	19
201-1000	22
1001-10,000	10
10,000+	6

As with most commodities and recyclable materials, the market for scrap tires is volatile and greatly influenced by economic factors, energy prices, and political circumstances outside of Vermont and, increasingly, outside of the United States. To respond to the findings of the survey and recommendations of the Beyond Waste Advisory Group, a tire stakeholder group (Tire Group) was convened in the spring of 2015. The Tire Group agreed that there were three areas of concern with scrap tire management in Vermont: legacy scrap tire piles, ongoing illegal dumping of scrap tires, and the lack of recycling markets. To address those concerns the Tire Group suggested options such as creating a monetary deposit on new tires, establishing an Extended Producer Responsibility (EPR) program, or adding a State-mandated fee on scrap tires. There was some consensus that any fee on tires to cover the management of scrap tires should be moved to the time of new tire purchase rather than at the time of disposal, and that the fee should be uniform and transparent. Additionally, the Tire Group discussed adding a fee on tires that would generate resources to address the legacy tire piles problem and to help to develop sustainable markets for scrap tires. A [Report to the Vermont Legislature on Problem Scrap Tire Piles – 2013](#) was written and can be found at.

B. TEXTILES

In response to the Beyond Waste Advisory Group priority materials, the Textiles Stakeholder Series was convened in the spring of 2016. Before developing a set of action items to improve the collection and diversion of textiles from the waste stream DEC reviewed a 2002 report, *Vermont's Municipal Solid Waste Diversion Rate: Results of Reuse and Recycling Survey*. That survey estimated just over 1,790 tons of textiles were diverted from the landfill in 2002. Although DEC has not commissioned a similar report since then, the 2014 diversion data submitted by 9 out of 27 SWMEs indicated just 147.58 tons diverted. Late reporting from two additional SWMEs added another 757 tons, and one for-profit organizations that provided DEC data added another 58.5 tons. Collectively, a low-end estimate of 963.08 tons were diverted in 2014. There are likely additional tons being diverted but it is not feasible to know how much more tonnage that may be since a large amount of textiles are managed through reuse organizations.

Participants in the stakeholder series determined that Vermont faces a unique challenge with a lack of convenient and affordable collection options across the state. Factors that contribute to these collection challenges include a steep decline in the commodities markets, as seen with other basic recyclables. Additionally, the rural geography of the state is expensive for end-users to transport to sorting hubs for processing and resale. With that in mind recommendations developed during the meetings focus more on infrastructure and market support than on outreach and education.

C. PHARMACEUTICALS

The 2016 Legislature adopted an Act Relating to Combatting Opioid Use in Vermont with the purpose of establishing a product stewardship program for collecting unused prescription drugs. Prior to adoption, Vermont did not have a mandatory statewide drug stewardship program for unwanted drugs, and drug manufacturers and producers had not supported a permanent collection program. Voluntary collection programs were offered by police stations and pharmacies. This law is being driven by the opiate addiction and overdose problem.

Oversight authority for the program was delegated to the Agency of Human Services, Department of Health to ensure that unused prescription drugs have convenient collection locations across the state for easy and safe disposal. This program is new and still being formed.

D. CHLORIDES IN PACKAGING

At the time of Act 78 adoption in 1987, chlorides were a high concern for the legislature to address. In the nearly 30 years since that legislation was adopted, the content of the products in the waste stream as well as their relative amount has changed. Product packaging continues to be a challenge for Vermont but the concern has moved further from the conversation of toxicity in packaging, to that of high tonnage but low or no recyclability. To be responsive to the evolving face of the waste stream, DEC has not placed specific priority on addressing chlorides but has worked to reduce toxicity in packaging through waste prevention and consumer education efforts.

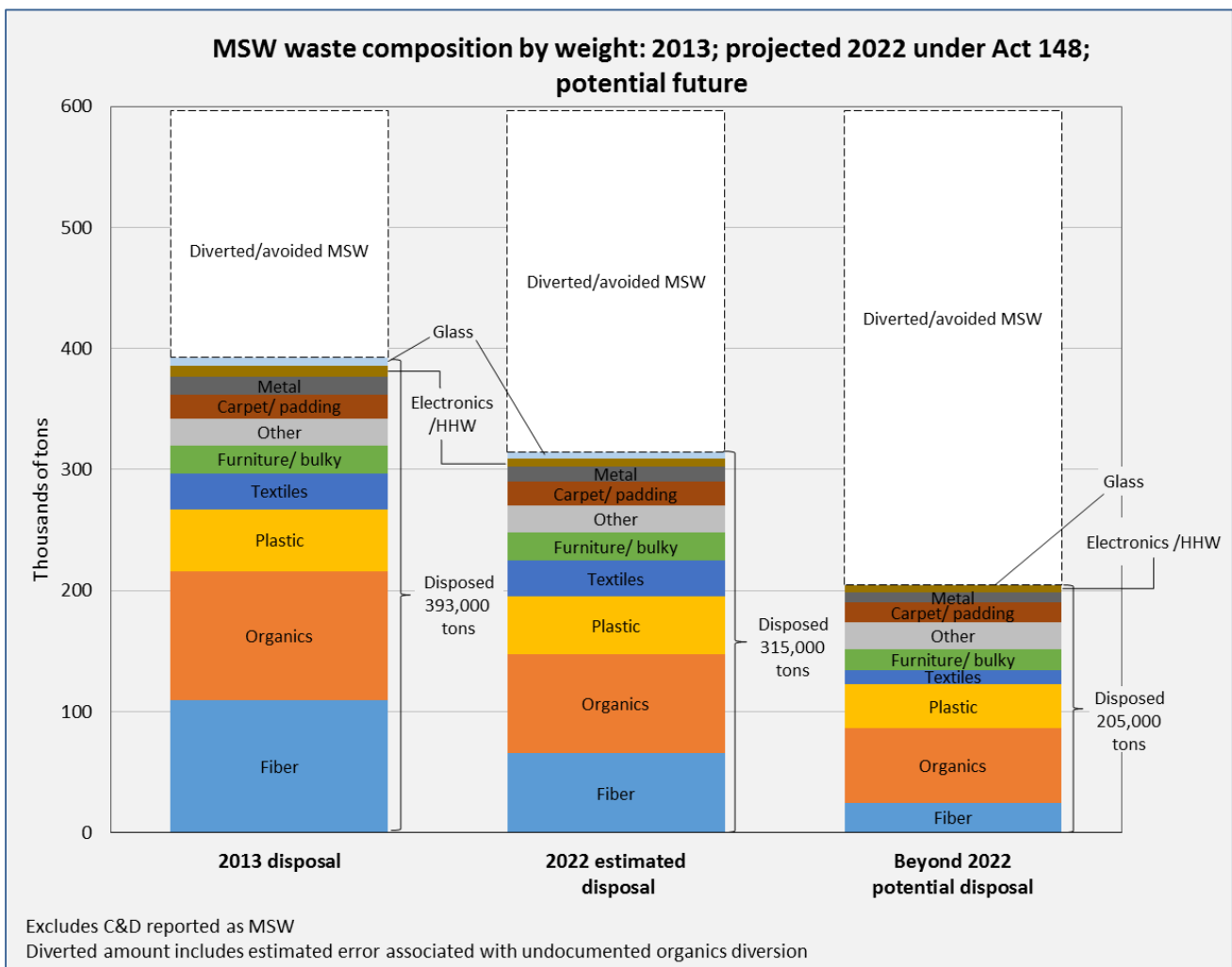
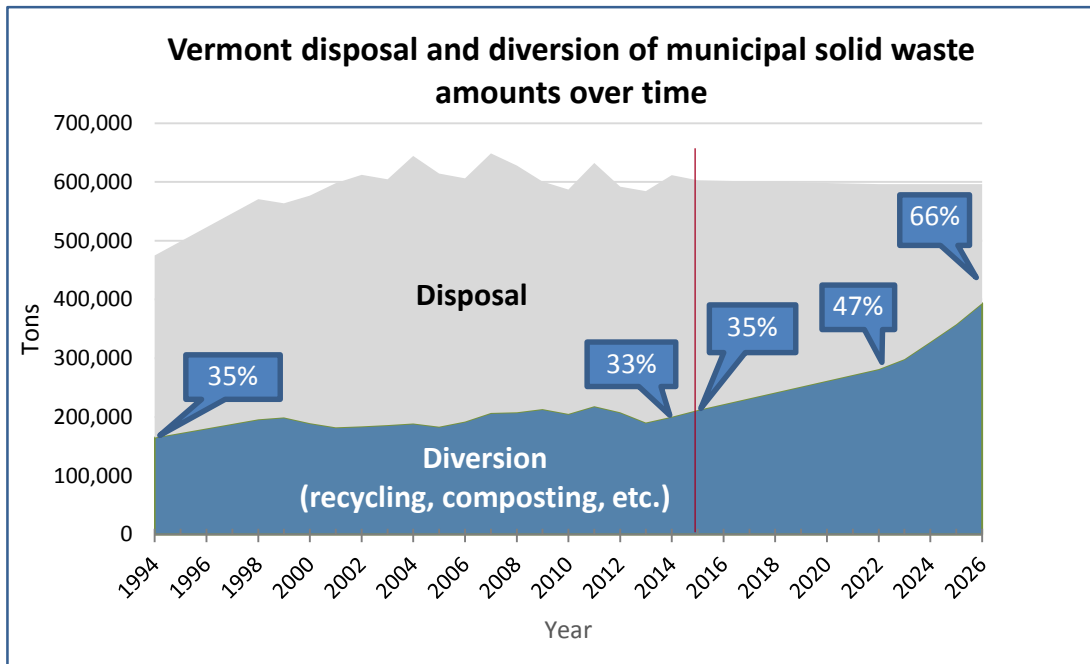
IV. NEW STATE DIVERSION FORECAST & RECOMMENDATIONS

NEW STATE DIVERSION FORECAST

In 2001 the Solid Waste Management Plan set a goal to divert 50% of the waste stream by 2005. However, the state's diversion rate has stalled between 30 – 36% diversion. A great deal of work has been completed since that time, including the passage of the 2012 Universal Recycling law, a 2014 adopted Materials Management Plan, and several new product stewardship programs. These efforts have set Vermont to meeting not only the 50% municipal solid waste diversion goal but potentially surpassing it and achieving the goal of 66% diversion by targeting materials identified by the Beyond Waste Advisory Group. In tandem with implementing UR policy to divert basic recyclables, food scrap, leaf and yard debris, and clean wood DEC anticipates the diversion rate to climb to 66% as material specific programs are implemented. This may be achieved through new programs to capture packaging and printed materials as well as textiles, carpet and padding, and bulky items.

A priority for DEC is not only to capture as much material as possible and direct to markets but to reduce the overall amount of waste generated as identified by the MMP. Preventing waste from being created avoids the need for expensive collection and disposal infrastructure, minimizes upstream impacts to the environment from product generation, processing, and transportation, and keeps more money in the pocket of consumers and tax payers. By promoting waste reduction through programs such as Food: Too Good to Waste that DEC provided pilot funding for, and reuse through textile donation and architectural deconstruction programs DEC is acting to mitigate waste as part of overall goals to achieve sustainable materials management.

The waste management sector nationally has evolved in the past 15 years to change the paradigm to a sustainable materials management approach. By focusing not only on the amount of materials diverted but also looking at the amount generated overall, DEC provides systems thinking approach to addressing difficult and nuanced material streams. This allows DEC to develop solutions upstream, closer to the source of production or consumption.



RECOMMENDATIONS

1. Fully Implement Existing Legislation

The Department of Environmental Conservation (DEC) recommends that the Vermont Legislature continue to support the existing laws adopted to prevent, mitigate and divert materials from our landfill. Despite its rural nature Vermont has a good foundation for providing convenient and consistent services to its residents and businesses. Through collaboration with municipalities and the private sector that collect, transport, and process materials within our borders, our solid waste infrastructure can be directed at recycling, organics diversion, and product stewardship programs rather than a primary reliance on landfills. By partnering with organizations outside of the field of traditional materials management, DEC can have more influence to prevent waste from being generated and assist with creating partnerships to exchange materials prior to needing downstream disposal options.

A. Universal Recycling

In summary, Universal Recycling is working. See the [Vermont's Universal Recycling Law – Status Report 2016](#) for more details. DEC is recommending no changes and supports full implementation of this legislation.

B. E-Cycles

The Program continues to be a model of success in state-legislated e-waste programs. DEC does not recommend any changes at this time. In the future, changes could be considered to address the changes in the electronic markets, where products may not fit well into today's defined categories and some devices may become less toxic.

C. Mercury Thermostats, Switches & Lamps

- i. **Thermostats:** DEC has requested and Thermostat Recycling Corporation (TRC) has committed to, increased mercury thermostat recycling outreach to both the public and contractor sectors in Vermont. DEC will be looking for increases in thermostat collection and will evaluate collection effectiveness next year.
- ii. **Auto Switches:** DEC supports the National Vehicle Mercury Switch Recovery Program (NVMSRP) and encourages further enhancements of removal strategies as well as information dissemination to all vehicle dismantlers. DEC recommends that the sunset provision for 10 V.S.A. §7108 be extended for a minimum of four years, or to reflect the NVMSRP extended timeframe that is likely to be chosen to extend that program.
- iii. **Lamps:** In 2017 National Electrical Manufacturers Association (NEMA) is required by statute to submit a new plan for managing lamps, to continue the manufacturer obligation for this program and to hire a third-party independent auditor to examine the overall effectiveness of the program for the past five years. DEC will continue to monitor the efforts of the program.

D. Batteries

[Call2Recycle](#) will continue to implement both the primary (non-rechargeable) battery stewardship program and the voluntary rechargeable battery collection program, and will promote them through news articles, radio, emails, bus signs and newspaper ads. Call2Recycle in partnership with solid waste management entities, haulers and retailers maintains 135 collection sites providing 96% of Vermont residents with access to a battery collection site within 10 miles of their home. The Agency does not recommend any changes to this program at this time.

E. Paint

[PaintCare](#) will continue to implement the paint stewardship and collection program and will promote public awareness of the program through social media, radio, tv and newspaper advertising and the distribution of brochures and factsheets at retail and other drop-off sites. PaintCare in partnership with solid waste management entities and retailers, maintains 74, year-round collection sites providing 99.5% of Vermont residents with access to a paint collection site within 15 miles of their home. The Agency does not recommend any changes to this program at this time.

2. Increase Household Hazardous Waste & Construction/Demolition Debris Diversion –

Beyond the existing legislation, DEC intends to place additional effort to address household hazardous wastes (HHW) and construction and demolition (C&D) debris. These two categories of material are resource intensive and expensive to manage. Historically HHW has been managed at the expense of municipalities with some financial assistance from DEC. Municipalities are stressed financially by offering HHW collection services which residents rely on throughout the year. DEC will work with stakeholders in the coming year to find solutions like funding assistance, or alternative program management options that will not sacrifice convenience to residents.

Following a series of stakeholder meetings DEC recognizes that the volume of construction and demolition debris, while not part of municipal solid waste, contributes a high level of tonnage to the landfill. The material is nuanced and is not easily mitigated through uniform programs or services without the assurance of market interest to procure the processed material for reuse or recycling. One of the C&D material types that DEC intends to solicit stakeholder input on is asphalt shingles. DEC will also continue to work with C&D stakeholders on Act 175 implementation.

3. Explore Diversion of Other Materials –

A. Packaging (paper-based and non-paper based), paper and printed material

The [Beyond Waste Advisory Group](#) prioritized these materials based on their high landfill volume in Vermont per the 2013 [Waste Composition Study](#). Considering the challenge of collecting these materials through existing systems, DEC intends to convene a stakeholder group to explore potential solutions to offer convenient collection, decrease disposal, and encourage sustainable packaging, paper and printed material production.

B. Tires

The Tire Stakeholder Group recognizes that there are many important details which must be understood before a scrap tire fee structure can be established and implemented. It is recommended that a group of interested stakeholders be convened to:

- Investigate the logistics and feasibility of moving to a fee based system where the cost of scrap tire management is part of the purchase price of new tires;
- Consider whether the fee is an Advanced Recovery Fee or Extended Producer Responsibility;
- Determine the appropriate fees to manage scrap tires, including a method of adjusting the fees to reflect changes in the marketplace;
- Establish a system of collecting, managing, and disbursing the funds collected;
- Determine the level of funding needed for the ongoing recycling of collecting scrap tires;
- Determine the funding, and potential sources of funds, needed for legacy tire pile clean ups;
- Identify types of financial assistance needed for market development; and
- Determine methods for tracking tires to ensure that the program is not collecting out-of-state tires.
- Provide an evaluation of the DEC's scrap tire compliance and enforcement strategy, and means to increase education of tire dealers, fleet managers, and the general public on scrap tire management.

C. Textiles

The Textile Stakeholder Series held from April to September 2016 resulted in a [Textile Reuse & Recycling in Vermont](#) report. It is the intent of DEC to work with stakeholders involved in those discussions as well as others to implement the recommendations identified in the report. Recommendations included:

- Request Vermont Solid Waste District Managers' Association to consider collaborating on a contract with one or more textiles collection organizations, which could help them find an affordable collector and ensure convenient infrastructure is in place and is maintained for Vermonters
- Improve information sharing between collectors and municipalities to clarify things such as how collectors evaluate ability to place a bin, or the type and quality of materials accepted through various collection methods
- Increase matchmaking efforts to partner schools and community groups with collection organizations
- Adopt consistency in language similar to neighboring state efforts to align with inter-state commerce

D. Plastic Bags

As part of the Beyond Waste Advisory Group priorities, DEC was directed to tackle materials that are high volume or pose high toxicity primarily to the waste stream. As DEC continues to chip away at those, stakeholders identified priorities for specific problem materials such as packaging. For example, in 2016 DEC provided testimony to the House Natural Resources and Energy Committee on the impact a disposable bag ban or bag fee may have on reducing the amount of single use bags consumed in the state with the goal of preventing the materials from getting into our waterways, obstructing views of the otherwise pristine landscape, and from film plastics that get caught in machinery at our recycling facilities, requiring time-consuming and costly delays that endanger workers.

In summary, there are numerous programs and a diverse portfolio of efforts underway by DEC, solid waste management entities, private for-profit sector, and partner organizations working to implement a variety of approaches to mitigate the toxicity of the waste stream and the amount of waste generated, increase the amounts of materials that have reliable and convenient diversion options, and reduced disposal tonnages. Visit www.vtrecycles.com or call 802-828-1138 to access these reports or to reach a DEC Solid Waste Management Program employee to provide further assistance.

APPENDIX A: Timeline of Act 148 Implementation Dates



Universal Recycling Law TIMELINE

**JULY 1
2014**

- » Transfer stations/Drop-off Facilities must accept residential recyclables at no separate charge
- » Food scrap generators of 104 tons/year (2 tons/week) must divert material to any certified facility within 20 miles

**JULY 1
2015**

- » Statewide unit based pricing takes effect, requiring residential trash charges be based on volume or weight
- » Recyclables are banned from the landfill
- » Transfer stations/Drop-off Facilities must accept leaf and yard debris
- » 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

**JULY 1
2016**

- » Leaf, yard, and clean wood debris are banned from the landfill
- » Haulers must offer leaf and yard debris collection
- » Food scrap generators of 26 tons/year (1/2 ton/week) must divert material to any certified facility within 20 miles

**JULY 1
2017**

- » Transfer stations/Drop-off Facilities must accept food scraps
- » Haulers must offer food scrap collection
- » Food scrap generators of 18 tons/year (1/3 ton/week) must divert material to any certified facility within 20 miles

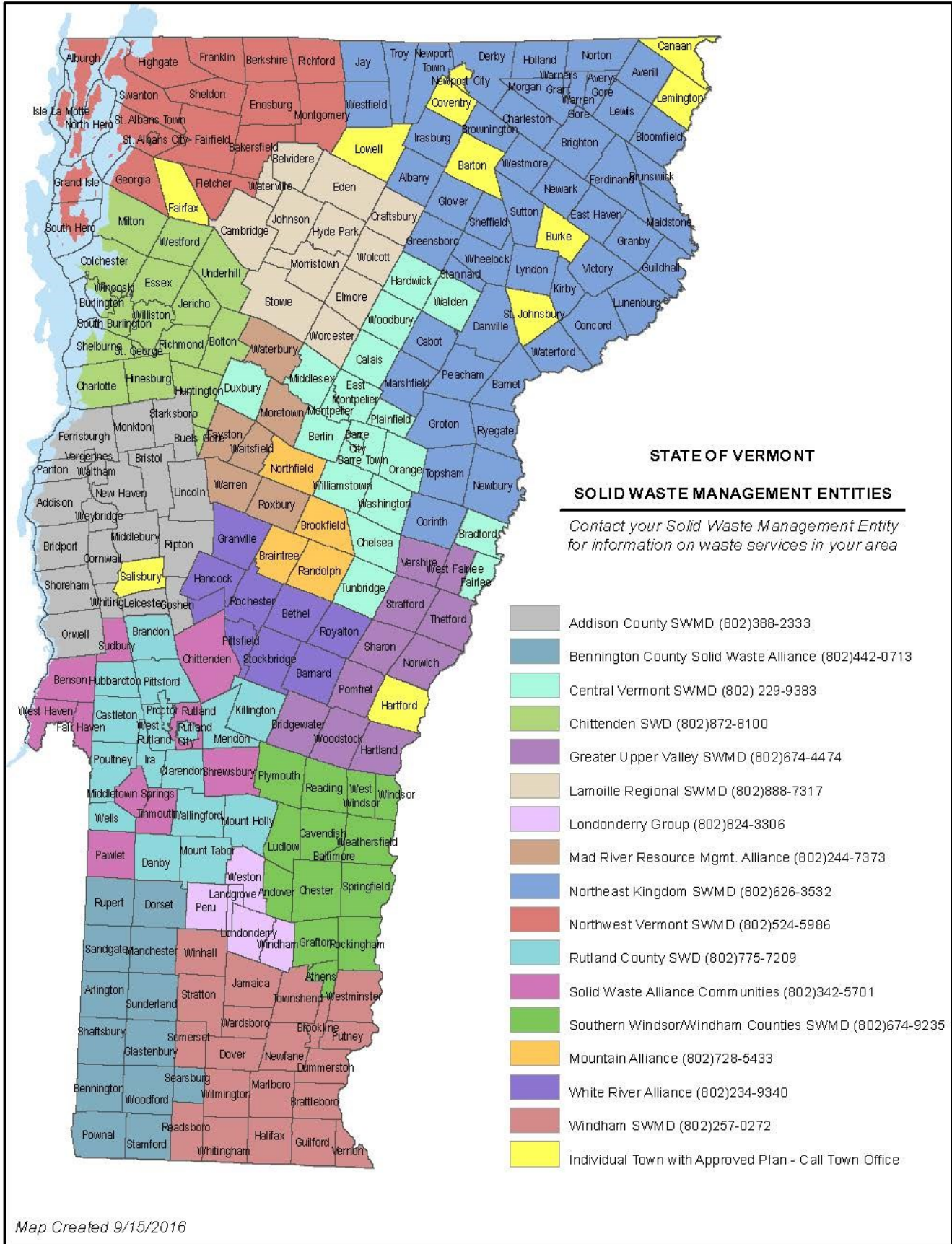
**JULY 1
2020**

- » Food scraps are banned from the landfill



» For more information, visit www.recycle.vt.gov

APPENDIX B: Map of Solid Waste Management Entities



APPENDIX C: Responsiveness Summary

Biennial Report on Solid Waste - 1987 Act 78, 10 V.S.A. §6604(b)

On November 10, 2016, the Department of Environmental Conservation (DEC), a department within the Agency of Natural Resources, posted the Draft Biennial Report on Solid Waste (Solid Waste Report) for public comment under public comment requirements. This report is submitted in compliance with Act 78 (10 V.S.A. 6604(b)), enacted in 1987. The Vermont General Assembly charged the Secretary of the Agency of Natural Resources (ANR) with submitting a report regarding the volume, amount, and toxicity of the Vermont's solid waste stream. In making recommendations, the Secretary is directed to consider both legislative and voluntary mechanisms for reducing waste, and to post the draft report for 45 days. In compliance with legislative mandate, a draft of this report was posted for 45 days prior to filing with the Legislature.

DEC received comments from several organizations during the comment period including Chittenden Solid Waste District, Addison County Solid Waste Management District, Northeast Kingdom Solid Waste Management District, Bennington County Solid Waste Alliance; and Casella Resource Solutions. DEC has organized the comments received into two sections. Those sections are Recommendations in the Solid Waste Report, and Content and Structure of the Solid Waste Report.

Recommendations in Solid Waste Report

DEC presents three main recommendations for the Legislature to consider in the Solid Waste Report. Those recommendations were framed to be inclusive of several laws and programs that DEC is implementing currently or seeks to establish in the future with Administrative and stakeholder support. For convenient reference, the three recommendations presented in the Solid Waste Report are:

- 1. Fully Implement Existing Legislation** - The Department of Environmental Conservation (DEC) recommends that the Vermont Legislature continue to support the existing laws adopted to prevent, mitigate and divert materials from our primary landfill, and to extend the sunset provision for the collection of mercury auto switches.
- 2. Increase Household Hazardous Waste & Construction/Demolition Debris Diversion** - DEC recommends increased efforts to address household hazardous wastes (HHW) and construction and demolition (C&D) debris. Over the next year DEC will work with stakeholders to identify new opportunities for funding collection of HHW and new ways to manage HHW. DEC will also continue to work with C&D stakeholders on Act 175 implementation.
- 3. Explore Diversion of Other Materials** – Over the next two years DEC anticipates convening a stakeholder group to explore potential solutions to offer convenient collection, decrease disposal, and discourage non-sustainable packaging, paper and printed material production. Other priority materials include tires, textiles and plastic bags.

Comment: DEC should include a recommendation to extend the timeframe for implementing the Universal Recycling law, or allow time to implement the Universal Recycling law before taking on other initiatives. DEC should state their position about the sunset provision of the mercury auto switch law. Additional legislative recommendations should be to modify the existing Beverage Container Deposit Law (Bottle Bill law) to retain glass and eliminate other container material types.

RESPONSE: DEC does not intend to introduce legislation or to modify existing legislation during the 2017 legislative session except to extend the 2017 sunset provision of the mercury auto switch law. The recommendation to extend the mercury auto switch sunset provision is a change to the initial report that was made following comments received. The Universal Recycling law adopted a phased-in timeline to offer

opportunity to plan, prepare, and implement aspects required by the legislation. It also offers requests for exemption to be submitted for DEC approval which allows an option for an extended implementation timeline.

Comment: Marketability of material should be part of the considerations made when evaluating the need and feasibility of new collection programs.

RESPONSE: Stakeholder input, including marketability of material, often is part of the discussion when evaluating potential programs. DEC chose not to call this out separately in the recommendations in the Solid Waste Report for that reason.

Comment: Programs for diverting C&D are expensive and options for diverting material are not well developed. The burden of that cost should not be placed on residents and DEC needs to consider extending implementation timeline. A moratorium on landfill bans should be included in DEC's recommendations until markets are sustainable for architectural waste.

RESPONSE: The current Architectural Waste law (Act 175) applies to large projects (mainly commercial) and is applicable when there is a diversion option within a 20 mile radius. It should not financially impact residents who primarily fall outside of the legislative requirements. A recommendation in the DEC Architectural Waste Report includes allowing time for more market development before expansion of the law.

Comment: Strategies to increase education and outreach to increase awareness and understanding of existing extended producer responsibility laws should be part of DEC's recommendation.

RESPONSE: The recommendations, as they are elaborated on in the main body of the report, include an outreach component for the mercury thermostat and auto switches, batteries, and paint. It also states that the mercury lamp program is required to submit a new plan and conduct a third-party audit, and that DEC will continue to evaluate the effectiveness of the program.

Comment: DEC should request that the Legislature modify the existing Universal Recycling law to repeal the requirements for haulers to collect landfill banned materials for households and small businesses in rural Vermont.

RESPONSE: The current law includes a provision for exempting haulers from the requirement to offer collection of mandated recyclables, leaf and yard, and food residuals, which allows the municipality to evaluate and decide whether to submit a request to DEC. A goal of the Universal Recycling law is to provide consistent and convenient services for collection, and diversion of materials identified as landfill banned items throughout Vermont.

Comment: Additionally, the landfill ban on food scraps should be applied to only large generators and not households.

RESPONSE: The statewide disposal ban on food residuals sets the goal and creates an incentive to change behavior. While it is anticipated that some amount of food residuals will continue to be disposed, the statewide ban will assist with creating a change over time. The UR law is already working by redirecting quality edible food to help Vermonters struggling with food insecurity, rather than go to end-of-life disposal or processing facilities (composting, anaerobic digestion, or landfill).

Content & Structure of Solid Waste Report

Statute requires DEC to seek comments on the recommendations included in the Solid Waste Report; however, comments were also received regarding the main body of the report. Below is a summary of comments and feedback received by DEC about either the overall report or specific aspects of the Solid Waste Report. DEC is appreciative of the additional feedback and has made several minor changes to the report based on these comments, which are available on DEC's website or upon request. To provide a response, the comments are categorized into three themes: general comments, implementation challenges, and specific comments about the Solid Waste Report.

A. General Solid Waste Report Comments

Comment: Multiple comments were received that provided positive feedback about the Solid Waste Report that was posted in its draft form. One comment referenced the usefulness of the report in having something compiled that can easily be share with Board Members.

RESPONSE: DEC is grateful for the feedback and strive to create content that is useful in a variety of settings to further the discussion of materials management that strives to gain support in achieving statewide goals to prevent waste, reduce toxicity of the waste stream, and capture materials for diversion rather than disposal.

Comment: Ample credit should be given to the DEC, Solid Waste Management Entities, and private sector for the contributions they have made to implement the various voluntary and mandated programs referenced in the Solid Waste Report. Diligence and commitment to getting new programs off the ground, expanding and supporting existing ones has been a collaborative effort worth acknowledging.

RESPONSE: DEC certainly agrees with this comment and extends much gratitude to the public and private sector, and various unexpected champions through partner organizations, for contributing to the goals and initiatives of achieving sustainable materials management for the state.

Comment: Statute requires the Secretary of the Agency of Natural Resources to report recommendations or options for legislative consideration. The new Administration will be in place shortly. DEC should allow time for the new Administration to review and vet the Solid Waste Report prior to submitting it to the Legislature.

RESPONSE: Statute indicates that the report shall be filled at the beginning of the biennium. DEC is working with the existing Administration to submit the report within that timeframe.

B. Challenges to Implementation

1. Contamination Comments: The report should provide more content on challenges of implementing initiatives and programs that may impede diversion, or may work to undermine the current collection systems operating due to contamination.

RESPONSE: Municipalities and the private sector face challenges with several types of contamination when collecting materials to recycle or process. Contamination can be related to incorrect materials placed with accepted materials, such as non-recyclable packaging placed in a recycling bin or non-compostable bags and PLU stickers in food waste delivered to a composting facility. Contamination can also occur within a processing facility, such as a MRF, where small amounts of one type of recyclable materials cannot be sorted from another. Resolving the challenges of contamination requires long-term collaborative work from all stakeholders. That work includes improvements to collection and processing methods, and continuous outreach and education. DEC is aware of the detriment caused by contamination and its potential to undermine achieving statewide goals. For these reasons, contamination is frequently part of our communications and presentations that DEC provides to the public and target communities. Including additional content on contamination in the Solid Waste

Report would better identify this challenge to the legislature but does not offer recommendations for legislative action to offer resolution. For that reason, DEC chose not to incorporate significant discussion of it in the main body of the report.

2. Marketability of Material Comments: Markets for basic recyclables as well as non-blue bin materials fluctuate and within recent years have seen a drastic drop in price. Collection and diversion infrastructure often is reliant on certain revenue thresholds. New or expanded collection and recycling programs may introduce other materials, as well as methods to process them for a variety of market interests. One example is various construction and demolition debris that offers opportunity to build infrastructure to increase diversion options. The report should address the challenges of implementing programs that have low markets, or difficult to find markets. The report should include content that summarizes changes to the infrastructure since the Universal Recycling law was adopted.

RESPONSE: The Solid Waste Report includes recommendations from DEC for actionable items for the Legislature to consider. Market forces are often a factor in the recovery, processing, and sale of materials whether it is through a voluntary or mandatory program. Many of the markets for materials generated in Vermont are located outside of the state boundaries and therefore are not under the authority for the Vermont Legislature to influence. DEC includes some discussion of markets as it relates to extended producer responsibility programs, and the need for additional collection programs or support for the Beyond Waste materials.

Changes in infrastructure are an expected part of the waste management sector, especially when a high percentage of services are offered through the private sector. Including content on the evolution of infrastructure changes cannot be represented thoroughly in this report, and can quickly change given the number of stakeholders in the state that are operating independently from one another. The Solid Waste Report is not the appropriate place to convey these changes, and does not provide the Legislature with recommendations that they are able to act on.

DEC will continue to work collaboratively with stakeholders to explore markets including those that may be available through state purchasing contracts, or policy development.

3. Expense to Implement System Comments: Multiple comments mentioned the expense associated with implementing various collection programs referenced in the Solid Waste Report. From the municipal perspective, household hazardous waste (HHW) collection is one of the most significant expenses. From the private sector, transportation and upgrading equipment to expand collection services are among the most significant expenses.

RESPONSE:

DEC acknowledges the need to balance cost of collection with convenience for residents. However, HHW is the most toxic portion of municipal solid waste. The Materials Management Plan offers options for municipalities to offer collection events, a year-round collection option, or partner with neighboring municipalities to reduce costs. Acknowledging the expense associated with HHW collection, DEC will continue to work with stakeholders to ensure collection opportunities are offered conveniently to ensure proper disposal of HHW.

Similarly, DEC acknowledges the costs of transportation and equipment necessary in some areas of the state to comply with parts of the Universal Recycling law. In recognition of these costs, DEC has encouraged solid waste management entities to seek exemptions that are already available in the law when the costs of compliance are prohibitive. DEC has also worked to expand markets and obtain funding for infrastructure to ensure consistent services statewide.

C. Comments Specific to the Main Body of the Solid Waste Report

Comment: Reformat the Executive Summary so that it serves as a two-page factsheet in style that can stand alone from the remainder of the report so that it can be shared and understood easily.

RESPONSE: DEC acknowledges the value of having a dual purpose executive summary for outreach and communicating accomplishments, goals, and recommendations on methods to achieve them. The current format of the executive summary includes content that DEC finds most important for conveying where we were before implementing the Universal Recycling law and several new initiatives, and the vision of where Vermont might be with increased and expanded collection services.

Comment: Data referenced or introduced in the report appear inaccurate, and referenced statistics may not be attributable to UR implementation alone. Additionally, the new forecast is not supported by the recommendations that DEC presents.

RESPONSE: DEC has confirmed that the data referenced in the graph is accurate per the [2014 Diversion and Disposal \(D&D\)](#) report. The disposal and diversion statistics referenced are a result of reported data reviewed and analyzed by DEC's staff. DEC compared 2014 D&D to 2015 D&D data to determine changes in disposal and diversion for MSW, and the Vermont Foodbank voluntarily provided data regarding increase they observed in food rescue.

Economic recessions have influenced decreases in disposal rates in the past. DEC evaluates diversion and disposal rates annually to observe trends, and will continue to evaluate that data to assess the level of impact of various programs and initiatives.

The new forecast is included to indicate where DEC envisions Vermont's diversion level may be in 10 years' time based on the combined efforts of each of the recommendations DEC proposes to the legislature. External factors are always at play and cannot easily be predicted or forecasted which prohibits DEC from taking that on in the report. Historically DEC has relied upon diversion metrics which is in line with methods used by the Environmental Protection Agency and several other state agencies similar to DEC. Acknowledging that diversion is not the best method of measuring impact, the new chart references both diversion and disposal. Given the adoption of diversion metrics outside of DEC, it is likely that both values will continue to be used by DEC in developing and communicating goals.

Comment: Reorganize and revise content to separate laws from programs rather than the current structure of Universal Recycling legislation, State Materials Management Plan, and extended producer responsibility or voluntary take back programs. Revise content to highlight DEC accomplishments rather than DEC goals, and provide more context to frame content and recommendations chosen to be included by DEC.

RESPONSE: Content of the report was organized so that established laws and programs are separated from additional DEC efforts to address materials that do not fall within those programs. The section on Beyond Waste Materials includes those materials yet to be addressed sufficiently by voluntary or legislatively adopted collection program.

Comment: Create a separate section for packaging, and separate household hazardous waste (HHW) from discussion on construction and demolition (C&D) debris in the report due to their different collection and processing methods.

RESPONSE: DEC opted to include discussion of construction and demolition debris and HHW together because the same recommendation applies to both material types, namely, to hold stakeholder meetings to evaluate options, establish stakeholder support, and improve and expand collection options.

Comment: DEC refers to the Beyond Waste Advisory Group that was convened in 2015. The parties invited to that group did not include organizations from the hauling sector.

RESPONSE: The Beyond Waste Advisory Group included municipalities, environmental groups, legislators, manufacturing companies, and representatives that have several industry clients. The materials discussed at that meeting were high level and had the goal of identifying and narrowing down specific categories of materials that are not covered under a well-supported collection program. Subsequent stakeholder meetings on topics identified by the Advisory Group were inclusive to all interested stakeholders, including the curbside hauling sector.

Comment: Landfill gas to energy (LFGTE) infrastructure and benefits should be mentioned in the report.

RESPONSE: Studies indicate that LFGTE is a better option for collecting and managing methane, a known Greenhouse Gas, and other gases released from landfills than burning the gases off through flaring. However, LFGTE is not as efficient at reducing GHG production as feeding food scraps to livestock, composting, or anaerobic digestion options.

Comment: DEC should provide a map of certified facilities and their available capacity to accept landfill banned materials.

RESPONSE: DEC is currently working to update the 20-mile radius map to reflect certified facilities that accept landfill banned materials. DEC is also developing a map of hauling companies that are offering collection of landfill banned materials and the geographic areas that they serve. These maps, once completed, will be distributed and posted to the DEC webpage.

Comment: DEC indicates that the law allows for exemptions to the hauling requirements of the Universal Recycling law if municipalities meet certain conditions and submit a request to the Secretary to approve proposed changes to their Solid Waste Implementation Plans. What details can DEC offer on the number of municipalities submitting the request and their reasoning for it?

RESPONSE: DEC has not included this content in the report because it will quickly be outdated information and it does not offer the Legislature actionable recommendations to consider. DEC would be happy to provide this information separately.

Comment: DEC should place more emphasis on backyard composting and preventative measures to reduce food waste within the home to minimize the need for curbside hauling of food scraps.

RESPONSE: DEC has funded the UVM Extension Master Composter course for over a decade. Within the last two years DEC has modified its funding for the course from being offered every other year to being offered annually. DEC has also offered grant funds to municipalities to implement Food: Too Good To Waste pilot programs that assist residents with recognizing how much food they waste and to offer options for how to reduce and divert it from the landfill. DEC is in the process of allocating funds to offer grants to municipalities to receive funding support to subsidize the sale of backyard composters to encourage residents to collect and manage food scraps at home.