2019 VERMONT MATERIALS MANAGEMENT PLAN:

Reducing Solid Waste & Increasing Recycling and Composting

Effective Date November 19, 2019

TABLE OF CONTENTS

INTRODUCTION

At a time when landfill disposal capacity in New England is expected to decrease in the near future, it is imperative that Vermont move forward with reducing waste, improving recycling, and composting, thereby reducing our dependence on landfilling while also reducing greenhouse gas emissions.

The purpose of the Materials Management Plan (MMP or Plan) is to provide a framework for the State and its citizens to prevent waste from being generated and expand reuse, recycling, and composting efforts to attain Vermont's statewide goals.

The MMP outlines actions that both the Agency of Natural Resources (ANR) and Solid Waste Management Entities (SWMEs) will take to reduce the amount and toxicity of solid waste in Vermont. SWMEs—including solid waste districts, alliances, and independent towns—complete actions, called Performance Standards, outlined in their Solid Waste Implementation Plans (SWIPs) that must conform with this MMP.

STATUTORY AUTHORITY

Act 78 of 1987—Vermont's first major solid waste management law—established the requirement under 10 V.S.A. § 6604, that "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…" Statute also requires this solid waste plan be revised at least once every five years.

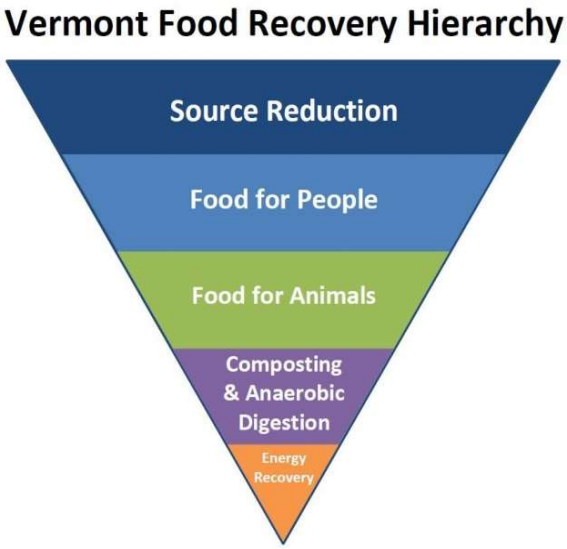
The first State Solid Waste Management Plan was adopted in 1989, revised in 2001, and then readopted in 2006. In 2007, a legislative mandate required ANR to evaluate the effectiveness of the plan and to develop a new vision for materials management. A group of stakeholders, the Solid Waste Working Group (SWWG), was tasked with evaluating and compiling a list of recommendations to accomplish State solid waste goals. The SWWG's 2009 report to the Legislature was a driving force behind the passage of Vermont's Universal Recycling law (Act 148 of 2012) and the 2014 plan, was named the "Materials Management Plan" (MMP) as it laid out a "sustainable materials management" vision. The 2019 MMP maintains the general "sustainable materials management" direction and actions laid out by the 2014 plan. ANR will continue to evaluate and prioritize sustainable materials management strategies that can reduce wastes and their impacts from production through end-of-life. Previous state solid waste plans and historic reports can be found on ANR/DEC's Solid Waste Program website.[1]

VERMONT'S WASTE

Act 78: Since the passage of Act 78 in 1987, progress has been made in establishing lined landfills and in reducing the toxicity and amount of waste disposed. While hundreds of unlined landfills once dotted the State, currently only one large double-lined landfill in Coventry handles the majority of Vermont's solid waste and captures landfill gas used to produce electricity. The closed Moretown landfill also captures landfill gas used to produce electricity. A small landfill still operates in Salisbury, but the Town voted in 2019 to proceed to closure. Under Act 78, much of the responsibility for solid waste planning, management and development of solid waste facilities was designated to local authorities. The State provided, and continues to provide, the guidance on what management practices are to be implemented and along with the SWMEs, provides the permitting authority to ensure that siting and management activities are followed and enforced. Initially, several regional landfills, including some under municipal ownership, were proposed and developed following implementation of Act 78.

[1] VTANR, Waste Management & Prevention Division, Solid Waste Management Program, Publications and Reports. dec.vermont.gov/waste-management/solid/publications-and-reports

None of these landfills are operating currently. This is generally due to the costs and required economies of scale associated with running landfills.



Universal Recycling (Act 148): In 2012, Vermont's Universal Recycling law (adopted as Act 148) unanimously passed the legislature. It was designed to reduce waste and increase recycling and organics diversion through disposal bans and convenience standards that require statewide collection of certain materials at the curb and at drop-off facilities. The law incentivizes reduction and diversion through variable rate pricing, or "pay-as-you-throw," and encourages investments in recycling and organics collection and management. Implementation of the law has been phased in over nearly a decade, allowing time to establish collection services and expand processing facilities for managing these materials. As noted by data shown in the recyclables and organics sections below, the Universal Recycling law is working.

2018 Waste Composition Study: Results from the most recent 2018 Waste Composition Study demonstrate:

a) Recycling policies are working, as evidenced by the statewide recovery rate of 72% —the percent of recyclables actually recycled.
b) A decrease in recyclable paper in the trash, from 16.7% of residential waste in 2002 to 8.6% in 2017.
c) Plastics, especially film plastics have increased in the trash in Vermont and elsewhere. Study authors estimate that by volume, plastics are the largest single material in the trash.
d) The percent of disposed residential food waste is not significantly different from the previous study. It is worth noting that decreases in one part of the waste stream have an impact on other parts. For example, as recycled paper and cardboard are increasingly recycled, food scraps and organics become a larger portion of what remains in the waste stream.

ANR expects that by 2023, when the next Waste Composition Study is due, we will be able to see more progress of the Universal Recycling law's ban on food scraps.

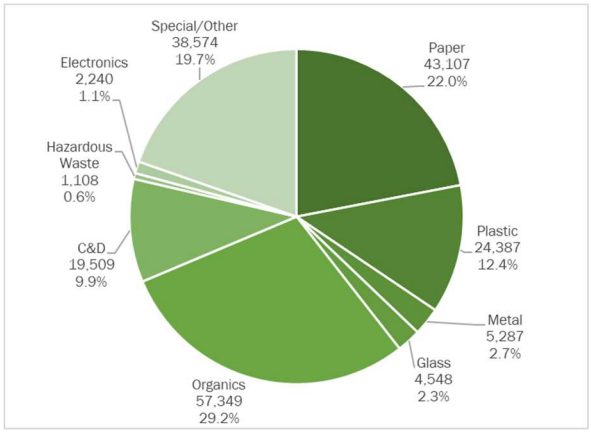


Figure 1. Residential Municipal Solid Waste (MSW) Composition (tons and % by weight), VT 2018

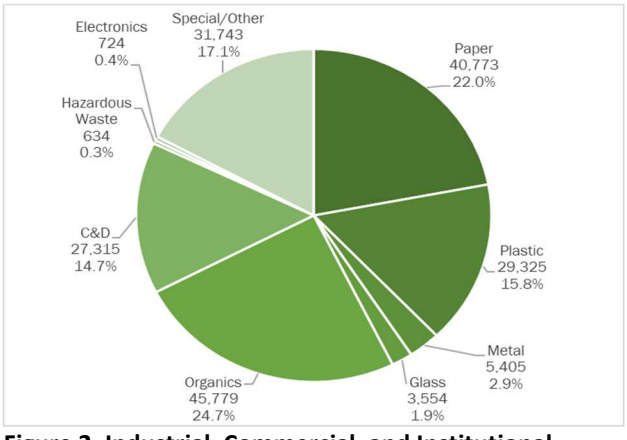


Figure 2. Industrial, Commercial, and Institutional MSW Composition (tons and % by weight), VT 2018

Even with improved recycling, food donation, and composting rates, waste generation in Vermont increased 11% from 2016 to 2017. Unfortunately, this reversed decreasing disposal trends seen in 2015 and 2016.

Vermont's 2018 Waste Composition study shows a similar percentage of food waste in the waste stream compared with the 2013 study. This reinforces ANR's support for maintaining the July 1, 2020 ban on food scraps in order to meet long-standing State diversion goals. Further, the Universal Recycling law's food scrap disposal ban provides assurance to those who are willing to invest in infrastructure, that food scraps will be available for processing. Several stakeholders have stated the law is part of their business plan and that they depend on the ban remaining intact.

PLAN PRIORITIES

As required by statute, the 2019 MMP Performance Standards were created to continue promotion of the following priorities established in 10 V.S.A. §6604(a)(1):

a) the greatest feasible reduction in the amount of waste generated;
b) sustainable materials management;
c) the reuse and closed-loop recycling of waste to reduce to the greatest extent feasible the volume remaining for processing and disposal;
d) the reduction of the State's reliance on waste disposal to the greatest extent feasible;
e) the creation of an integrated waste management system that promotes energy conservation, reduces greenhouse gas emissions and limits adverse environmental impacts; and
f) waste processing to reduce the volume or toxicity of the waste stream.

MARKETS and FACILITIES ASSESSMENT

Statute requires that the Materials Management Plan include the following:

a) an assessment of the feasibility and cost of diverting specific material categories defined as "marketable recyclables, leaf and yard waste residuals, food residuals, construction and demolition residuals, household hazardous waste, and other categories that the Secretary identifies that may be diverted to meet the waste reduction priorities of the Plan.";
b) a survey of existing and potential markets for the above materials;
c) methods to reduce and remove material from the waste stream including organics, textiles, and construction and demolition debris;
d) methods to separate, collect, recycle, treat or dispose of wastes that create environmental health, safety or management problems including tires, batteries, obsolete electronic equipment, and unregulated hazardous waste;
e) assurance of recycling and prevention of incineration or disposal of marketable recyclables;
f) an assessment of facilities and programs necessary at the State, regional, or local level to achieve the priorities identified in this Plan.

Each of these requirements is addressed in the material specific sections below.
Measurable diversion targets, coordinated education and outreach components, and performance and accountability measures are covered in the Performance Standards section of this Plan.

RECYCLABLES

Facilities: After decades of recycling investments, Vermont generally has the recycling facilities needed to process its recyclables for end markets, though periodic assessment and upgrades are essential to adapt to changing inputs and ensure access to markets. Most recycling is processed by two single-stream material recovery facilities (MRFs) in Williston and Rutland; the rest is processed at smaller facilities like Pownal and Lyndonville or sent to recycling facilities out of State. With a shift in global market availability, there is a need to

provide improved processing of materials so that recyclables can better qualify as inputs into the manufacturing of new products.

Diversion Status: In 2015, Vermont's Universal Recycling law banned disposal of mandated recyclables defined as "aluminum and steel cans; aluminum foil and aluminum pie plates; glass bottles and jars from foods and beverages; polyethylene terephthalate (PET) plastic bottles or jugs; high density polyethylene (HDPE) plastic bottles and jugs; corrugated cardboard; white and colored paper; newspaper; magazines; catalogues; paper mail and envelopes; boxboard; and paper bags."

Vermonters regularly recycle, as evidenced by a strong statewide recovery rate of 72% from the 2018 Waste Composition Study. The study also found a noticeable decrease in recyclable paper from 16.7% of residential waste in 2002 to 8.6% in 2017. Over the last several years, recycling by weight has increased slightly but largely remained stable. This is a positive trend, considering that packaging is now up to 20% lighter than in the past, which means that the overall quantity of recycled items has actually increased.

Markets: Until recently, approximately one-third of U.S. recycling was sent to China.[2] In early 2018, China's National Sword initiative effectively banned the importation of many recycled materials. This loss of end-markets has resulted in a global over-supply of many recycled materials, which has reduced the value of these commodities, especially mixed paper (newspaper, office paper, cereal boxes, paper mail, magazines, etc.) and glass. As a result, tip fees at recycling facilities around the northeast have nearly doubled over the past year. 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 and to encourage consumers to purchase, and manufacturers to produce, post-consumer recycled (PCR) content packaging and products.

Mixed Paper: Of the recyclables Vermonters produce, mixed paper is most impacted by China's policies. Prior to 2018, China was importing about 50% of all U.S. recycled mixed paper.[2] The loss of the Chinese mixed paper market has had direct economic impacts on Vermont. 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 bale their own recycled paper. NWSWD sends recycled paper to the West Rock Missisquoi paper mill in Sheldon Springs, Vermont to be made into food-grade box board, while NEKWMD sends recycled paper to Green Fiber in Pennsylvania for use in cellulose insulation.

In the spring of 2018, the Legislature authorized the ANR Secretary to issue a waiver allowing mixed paper disposal 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.

Recycled Glass: Glass from the Rutland single-stream MRF had been sent to Strategic Materials' Franklin, Massachusetts glass processing facility, where the material was sorted, cleaned and refined into feedstocks for

[2] National Public Radio and July 2018 webinar by Waste Management, Inc.

products like fiberglass 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.

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. Casella has installed additional equipment at the Rutland MRF to clean glass that is currently sent to recycled glass processor 2M in Canada to be used in fiberglass insulation, aggregates, and abrasives. Casella also continues to look for additional markets for this recycled product.

Chittenden Solid Waste District has invested in glass processing equipment at their Williston MRF that can process glass to meet DEC's processed glass aggregate standard and 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 also met with representatives from Glavel, a New York 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; some recycled glass from VT could eventually be used by this facility if the glass can be processed to their specifications.

ORGANICS

Background: The term "organics" refers to material derived from living organisms, and includes leaf and yard debris, food scraps, wood, paper and paperboard products (note: although technically organic, paper and paperboard products are considered recyclables in this Plan). According to the U.S. EPA, food and food scraps, are the largest single component of waste that is landfilled.[3] That is also true for Vermont, where food waste made up nearly 20%, or more than 77,000 tons, of the Vermont municipal solid waste stream according to the 2018 Vermont Waste Characterization Study.[4]

Diverting organics saves landfill space and significantly reduces production of methane gas—a greenhouse gas that is 21 times more damaging than carbon dioxide.[5] Reducing food waste saves natural resources invested in growing, packaging, distributing, processing, and selling food. Diverting organics also saves these valuable natural resources for uses such as food for people, food for animals, food production through use of compost as a fertilizer, stormwater filtration, erosion stabilization, and energy generation through anaerobic digesters.

Starting in 2014, Vermont's Universal Recycling (UR) law has required larger food scrap generators to separate food scraps from trash if they are located within 20 miles of a certified composting or digestion facility. The UR law also banned disposal of leaf and yard debris and clean wood in 2016 and will ban disposal of food scraps by any size generator beginning July 1, 2020.

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[3] US EPA, *Advancing Sustainable Materials Management: 2015 Fact Sheet,* (July 2018), fig. 8, page 8,https://www.epa.gov/sites/production/files/2018-07/documents/2015_smm_msw_factsheet_07242018_fnl_508_002.pdf

[4] https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/2018-VT-Waste-Characterization.pdf

[5] Houghton, J.B.; Meira Filho, L.G.; Callander, B.A.; Harris, N.; Kattenberg, A.; Maskell, K., Intergovernmental Panel on Climate Change, *Climate Change 1995: The Science of Climate Change*., 2 (1996).

Facilities:
Food & Food Scraps: Currently, Vermont has 12 certified food scrap processing facilities (11 composting & 1 anaerobic digestion) that operate year-round and process organics like food scraps and leaf and yard debris. Spent grain, whey and other food-manufacturing-byproducts are commonly fed to animals at farms throughout the state. Vermont also has 17 on-farm digesters, some of which accept food-processing byproducts from dairy, brewing, and other food manufacturing to produce electricity and heat. See the 2019 Universal Recycling Status Report for a map of these facilities. ANR has confirmed via outreach and compliance checks that 108 transfer stations in Vermont are offering food scrap collection, representing 100% compliance with this state requirement.

The Vermont Foodbank has helped decrease the disposal of edible food through their Retail Store Program, which rescues food from stores and distributes to their network of over 200 Vermont food shelves and meal sites.

Leaf and Yard Debris and Clean Wood: Most leaf and yard debris and clean wood, that are not composted at homes or managed onsite, are used as mulch, animal bedding, composted at certified facilities, or, in the case of clean wood, used as fuel (such as wood stoves, or chipped for heat/power at locations like the McNeil Power Plant in Burlington). Each SWME ensures a location exists within their region where clean wood can be collected, such as at stump dumps or transfer stations. These materials are often chipped for mulch or composting. Thanks to the landfill ban, a relatively small amount of leaf and yard debris and clean wood is landfilled, comprising about 0.8% of the residential waste stream, according to the 2018 Waste Composition Study.

Diversion Status: The 2018 Vermont Waste Composition Study found that 26% (57,349 tons) of residential waste disposal is organic material and about 23% (45,779 tons) of industrial, commercial, and institutional (ICI) waste is organic. These numbers are similar to those found in the 2013 Waste Composition Study (28% residential and 18% ICI). However, due to limited funding for that study, the 2013 ICI waste figures were less accurate. ANR believes the most informative comparison will be between the 2018 study and the future 2023 Waste Composition Study, as they should have more comparable methodologies and the 2023 study will take place about two years after the 2020 ban on food scraps.

From 2014 to 2017, food donation almost tripled according to the VT Foodbank, in large part due to the Universal Recycling law which, starting in 2014, required large generators of food waste, like retail grocers, to divert food from the landfill. The Foodbank helps stores set up systems where staff set aside food for donation instead of putting it in the trash.

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 two recent surveys—UVM's 2018 VT Household Food Waste Behaviors Report and the 2018 Waste Composition Study's Vermont Food Scrap Survey by Castleton Polling Institute—approximately 50-70% of Vermonters say they separate some of or all of their food waste with backyard composting, vermiculture or feeding animals. The 2018 Waste Composition Study found an estimated 40% of residential food waste is diverted from trash primarily through composting (backyard, at drop-offs, and through curbside haulers). UVM's study also found that 56% of respondents strongly agree or somewhat agree that food waste should be banned from disposal in the landfill.

Using EPA WARM (Waste Reduction Model), DEC estimates that composting all of Vermont's food waste would reduce greenhouse gas emissions equivalent to taking over 7,000 vehicles off the road each year.

Markets: Donation of quality food to feed those in need has been a great and early success of Vermont's Universal Recycling law. Credit is due to the Vermont Foodbank, their partner food shelves and meal sites, and to the Vermont grocery stores and food establishments that take time to carefully rescue edible food from being wasted.

Composting is the most common method of recycling/diverting food scraps and other organics from the waste stream. In general, tipping fees (fees paid by haulers to tip the contents of their truck) for food scraps range from $20/ton to $60/ton. By comparison, trash disposal tip fees can range from $60/ton to $130/ton depending on volume and distance to a landfill.

It is worth noting that since passage of the Universal Recycling law in 2012, the number of haulers offering food scrap collection services has nearly doubled from approximately 12 to 21. This includes haulers that offer both trash, recycling and now food scraps collection as well as haulers that specialize in food scrap collection.

Currently, the markets for finished compost are mostly local, although some composters sell products in the Northeast and beyond. Retail prices vary depending on the quality, grade, and volume of compost sold. Average prices for one cubic yard of finished compost are typically between $46 and $72. As more compost is produced, ANR has been seeking ways to promote compost markets to help this diversion industry. Please see ANR Performance Standard AO1 for further detail.

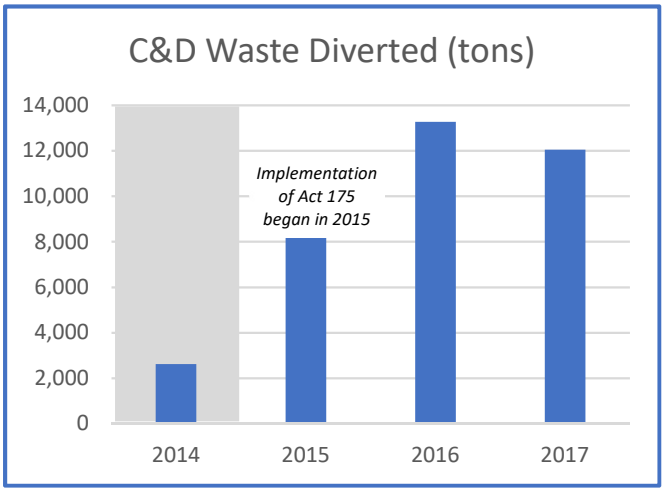
The anaerobic digestion of food scraps is beginning to grow in- and out-of-State. In addition to heat and power from biogas, anaerobic digestion creates liquid and solid digestate that can both be used as fertilizer for farm fields. While digestion requires significant capital investment, its ability to produce power and heat can provide additional returns on that investment.

CONSTRUCTION AND DEMOLITION (C&D)

Facilities, Diversion Status, & Markets: According to the 2017 Vermont Diversion and Disposal Report, 85,234 tons of C&D waste materials were disposed in the landfill in 2017, and an additional estimated 12,036 tons were diverted for recycling.

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. Construction & demolition materials frequently have a low recycling market value and require sorting, and often chipping or 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 less interest in 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.

Adopted in 2014 by the Vermont Legislature, Act 175 requires the recycling or reuse of six C&D materials - metal, clean wood, asphalt shingles, drywall, oriented-strand board, and plywood - from large projects within 20 miles of a C&D recycling facility. The law requires that these materials be recycled by anyone building a project of two or more units that generates 40 cubic yards or more of architectural waste and is within 20 miles of a C&D recycling facility.



The Chittenden Solid Waste District reported that C&D recycling doubled from 2014-2017 after the siting of a C&D recycling facility in Chittenden County and the growing awareness within the construction industry of alternatives to C&D disposal. The combination of more facilities collecting and recycling C&D materials near Vermont's construction areas with access to better end markets is one way to make C&D recycling cost-competitive with disposal.

The Agency of Natural Resources and the Agency of Transportation have also been collaborating to use asphalt shingles in road construction projects.

FIGURE 16: C&D WASTE DIVERTED

Some other beneficial uses for C&D materials are the McNeil Generating Station in Burlington, where clean wood is burned to produce electricity; the nonprofit ReSource that operates household goods and building materials stores in Barre, Burlington, Hyde Park, and Williston; and other similar stores such as Cover and Vermont Salvage in White River Junction.

The market for recycled gypsum is currently limited. However, based on conversations with the industry and neighboring states, we believe markets will improve in the future. Synthetic gypsum, created from flue gas desulfurization at fossil fuel fired power plants, makes up about half of the gypsum used in drywall manufacturing. The supply of synthetic gypsum is waning as fossil fuel energy sources decrease as renewable energy sources increase. Further, construction and demolition waste recyclers do not want drywall in incoming mixed material loads as the drywall becomes pulverized and tends to devalue the quality of all recyclables. Landfills do not want drywall in the waste stream as the gypsum, when wetted in an anaerobic environment, creates toxic, odorous, and corrosive hydrogen sulfide gas. For these reasons, northeast States want to expand and strengthen drywall recycling markets. 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.

HOUSEHOLD HAZARDOUS WASTE, CONDITIONALLY EXEMPT GENERATOR HAZARDOUS WASTE, AND UNIVERSAL WASTE

Background: The US EPA describes household hazardous waste (HHW) as leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients that pose a threat to the environment and public health. These chemicals are costly to collect and manage separately from municipal solid waste. Such products include automotive fluids, batteries, household chemicals, and electronic products with hazardous components.

Vermont Solid Waste Rules define HHW as "waste that would be subject to regulation as hazardous waste if it were not from households" (6-201 Definitions). Although HHW is exempt from state and federal regulation as hazardous waste, Vermont statute requires ANR to address the volume and toxicity of the waste stream. Vermont has worked carefully to segregate HHW from solid waste, to reduce production of toxic materials at the source, and to safely manage/recycle these materials at the point of waste generation.

Conditionally Exempt Generator (CEG) hazardous waste is hazardous waste from a business, municipality or other non-household entity that generates less than 220 pounds of hazardous wastes per month. Waste

collected from CEGs must be managed under Vermont Hazardous Waste Management Regulations (VHWMR) and therefore should be segregated from HHW.[6] If CEG waste is co-mingled with HHW, then all waste is managed as hazardous waste and the exemption for HHW management may not be utilized. Universal Waste refers to any of the following hazardous wastes that are handled under streamlined provisions to facilitate proper management: batteries, pesticides, thermostats, PCB-containing fluorescent light ballasts, fluorescent lamps, mercury-containing devices, cathode ray tubes (CRTs) and oil-based paint collected under the paint stewardship program.

Facilities and Collection Events: Since 1992, SWMEs have been required to include provisions in their SWIPs for the collection and management of "unregulated hazardous waste," which includes both HHW and CEG waste. The state MMP requires SWMEs to hold a minimum number of HHW collection events per year or provide access to a permanent HHW collection facility. To help offset costs of HHW collections, ANR has provided annual SWIP grants based on population of the region served and the number of member towns in districts or alliances.

Currently, there are five permanent HHW facilities in Addison County, Chittenden County, Northeast Kingdom (seasonal), Northwestern Vermont, and Rutland County. The remainder of the State is served by over 120 single-day collection events. SWMEs and ANR continue to evaluate the best way to manage HHW and, in the summer of 2017, ANR organized a HHW stakeholder group comprised of solid waste districts, towns and alliances, haulers, trade associations, State representatives, hazardous waste contractors, and environmental non-profits to find more convenient and cost-effective collection systems for HHW. The group agreed that a network of shared regional facilities coupled with possible rural collection events was the best option to serve Vermonters. There was no consensus on the best way to fund this model, but funding suggestions are listed in the November 2017 HHW Stakeholder Group Summary report.

The requirements set forth in the SWME Performance Standards below provide Vermonters with convenient collection services for HHW and CEG Hazardous waste while providing flexibility for solid waste management entities.

Diversion Status: In 2017, 865 tons of HHW/CEG hazardous waste were diverted from landfill disposal and collected by SWMEs. The 2018 Waste Composition Study estimated that less than 0.5%, or 1,489 tons, of the waste stream was HHW. This shows that strong efforts have been made to keep HHW/CEG hazardous waste out of the waste stream, but there is still room for improvement. Since this waste poses such serious risks to human health and the environment, it is imperative that the goal be zero disposal of HHW in landfills.

Current residential participation rates at both HHW facilities and HHW collection events in VT range from 0.5% to 15% of households served in a region annually. The regions with permanent HHW facilities tend to have higher participation rates than those with only seasonal HHW events. Considering the frequency with which HHW needs to be disposed of and the accessibility of collection programs, 14% is considered a successful participation rate goal. Because of the hazardous characteristics of HHW/CEG Hazardous Waste, there is a need to increase participation in order to prevent hazardous materials from being disposed of in the landfill or through other improper disposal methods, such as down the drain.

This Plan's Performance Standards seek to decrease the amount of hazardous materials being disposed of in the landfill and to increase the participation rate by ensuring that convenient access is provided for HHW/CEG Hazardous waste collection in all regions of the state.

[6] Vermont Agency of Natural Resources, *Hazardous Waste Management Program: Regulations & Statues*, (2013), http://www.anr.state.vt.us/dec/wastediv/rcra/regs.htm, and Subchapter 9: Universal Waste Management Standards, http://www.anr.state.vt.us/dec/wastediv/rcra/hazregs/VHWMR_Sub9.pdf.

Markets: Due to their hazardous characteristics, HHW waste materials have limited market demand. HHW markets are predominantly associated with material that has value as fuel, such as used oil or oil-based paint, but most other HHW is costly to handle, transport, and process for recycling or safe disposal. Hazardous waste contractors and processors are paid for the removal and handling of HHW. Hazardous waste processing facilities charge the contractors a fee based upon the type of material and whether it can be processed for another use. In the case of used motor oil, there is a market to re-blend this fuel and reuse it for various applications. For other materials such as certain pesticides, the only option is for the waste to be disposed of in a hazardous waste landfill or hazardous waste incinerator.

By weight, oil and latex based paints are the most common household hazardous waste products that are collected at HHW facilities and events. Vermont's paint stewardship program, implemented by PaintCare, offers convenient oil and latex paint recycling collection at paint and hardware stores statewide. Latex paint that is collected is sorted by color, filtered and re-blended into new paint such as with Chittenden Solid Waste District's Local Color paint recycling program. Oil-based paints, while not recycled, can be processed for fuel blending. Some cities and counties have initiated their own latex paint collection and recycling programs similar to Chittenden's program. Paint stewardship programs like Vermont's have greatly increased latex paint recycling.

PRODUCT STEWARDSHIP & EXTENDED PRODUCER RESPONSIBILITY

Product Stewardship programs share the cost of recycling and safe materials management between manufacturers and consumers, alleviating financial burdens on municipalities and mitigating environmental impacts from disposal.

Extended producer responsibility (EPR) programs require product producers to take responsibility for the end of life management (or post-consumer management) of their products. The intent of all EPR and product stewardship programs is to nurture a shift in the waste management system from one subsidized by the taxpayer to one that places greater emphasis on producers and consumers to drive environmentally sound product design and recycling. Vermont has both voluntary product stewardship programs, such as recycling of auto batteries, and programs that are required by EPR laws.

Products with existing Vermont EPR programs and laws include mercury-containing (fluorescent) lamps and thermostats, mercury-containing automobile switches, electronics (TVs, computers, printers, and peripherals), primary batteries, and paint. In addition, there is a voluntary product stewardship program led by rechargeable battery manufacturers that collects rechargeable batteries for recycling. EPR in Vermont has historically targeted products with hazardous components. Vermont's beverage container redemption program is an example of product stewardship of a non-hazardous product; it is the longest-running EPR program in Vermont, at more than 40 years old.

Vermont's EPR programs are effective largely due to numerous convenient collection locations throughout the State, the dedicated collection efforts by stewardship organizations, SWMEs and private facilities; and direct outreach to consumers by the stewardship organizations, SWMEs, and Vermont DEC. The Agency of Natural Resources will continue to evaluate EPR and product stewardship programs that can reduce waste in both toxicity and volume and that can reduce costs for Vermonters. For more detail about these stewardship programs and their status and success, see the 2019 Biennial Report on Solid Waste.

TEXTILES (USED CLOTHING)

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,

including Goodwill, Salvation Army, and Planet Aid, municipal solid waste managers are concerned that textile reuse and recycling markets are not strong and remain vulnerable. Domestic and global textile recycling options are limited, and reuse options are hampered by the lower quality of clothing and textiles being produced.

From 2014-2017, diversion data reported by solid waste facilities appears to indicate that textiles re-use and recycling has grown, however data is lacking from clothing reuse shops like Salvation Army and Goodwill, and these increases may be the result of improved reporting and may not be indicative of improvements in textile recycling trends.

Year	Tons Diverted
2014	248.4
2015	254.3
2016	303.1
2017	369.6

TEXTILE RE-USE & RECYCLING

The 2018 Waste Composition Study estimated that textiles make up 6.1% of Vermont's waste stream, or 11,867 tons annually. The 2013 Waste Composition study estimated textiles made up around 6.8% of the waste stream.

TIRES

An estimated 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: 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).

The Agency of Natural Resources believes that most Vermont tires are legitimately managed, but the issues identified by the stakeholder group continue to be a concern. Most of Vermont's tires are now used to make tire-derived fuel. 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. Due to these challenges, establishing a product stewardship program for tires is often considered. Efforts to identify other national markets are ongoing. Tire Derived Aggregate will 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.

BIOSOLIDS, SLUDGE, SEPTAGE, AND RESIDUALS

"Residuals" is a term encompassing several non-hazardous materials. Residual materials managed in Vermont include sludge, septage, short paper fiber, wood ashes, and solids produced by drinking water treatment facilities. Residual materials may be disposed of at certified solid waste facilities such as landfills or wastewater treatment facilities. Alternatively, after meeting specific standards established in the Vermont Solid Waste Rules (Rules), residual materials may be beneficially used and recycled as a soil amendment.

Wastewater sludge, the solid or semi-solid byproduct produced by a wastewater treatment facility (WWTF), and domestic septage, the partially-treated material removed from an on-site septic system or holding tank, may be managed via application to the land as biosolids (treated sludge) or as stabilized septage only after treatment to significantly reduce pathogen and vector attraction, and demonstration of meeting standards for contaminants (metals and poly-chlorinated biphenyls) established in the Rules. Biosolids treated in a process to further reduce pathogens are considered exceptional quality (EQ) biosolids and may be distributed to the public for soil amendment uses without restrictions.

Because residual materials have the potential to be recycled by application to agricultural lands or to remediation sites as a valuable soil nutrient source or soil conditioner, ANR has established Rules, developed technical guidance and implemented a solid waste certification for all facilities producing biosolids or operating land application sites for biosolids or stabilized septage.

Land application sites must be certified as solid waste facilities and meet the siting and operating criteria established in the Rules. Certifications for land application sites also include specific operating conditions for reducing potential impacts to environmental and human health. Solid waste certifications are administered by the ANR, DEC Residuals Management and Emerging Contaminants Program (Program). All solid waste facilities generating sludge, and not managing the material under the authority of a solid waste certification, are required to obtain a Sludge Management Plan administered by the Program. Pilot and research projects in the scope of residuals management are also authorized and supported by the Program on a case by case basis.

Generators of residual materials, such as WWTFs, as well as residual material managers, such as septage haulers, are required to report their activities to ANR on a quarterly basis. Monitoring requirements for residuals generators are established in either a sludge management plan or a solid waste certification for the facility. While all sludge generators must routinely collect and analyze samples of residual materials, facilities operating under a solid waste certification have more extensive monitoring requirements, including routine sampling and analysis of soil and groundwater at land application sites. Managers of land application facilities must also calculate appropriate application rates based on agronomic data and manage fields in accordance with required agricultural practices established by the Vermont Agency of Agriculture, Food & Markets (AAFM). Such calculations are submitted to ANR along with quarterly reports.

The decision to recycle or dispose of residual materials is made at the local level by municipalities and industrial and commercial enterprises and based on many factors including economics, geography, type of facilities (storage and treatment) and the mission of waste managers and generators. About half of the wastewater sludge produced in Vermont is beneficially used, a statistic that reflects the trend across the United States.

Septage generated in Vermont, with nearly 55% of residences on septic systems, is typically hauled to WWTFs for disposal. The remaining amount is land applied after lime stabilization for pathogen and vector attraction reduction. Because Vermont's WWTFs have limited treatment capacity and accept other high strength wastes such as landfill leachate and food processing wastewater, and because many rural Vermont communities are not served by a WWTF or a WWTF that accepts septage, the land application of stabilized septage relieves some of the capacity limitations that WWTFs have for accepting various wastes and also provides a more local solution for septage management in rural areas of the State that are not served by WWTFs.

Solid Waste Implementation Plan Requirements and Approval Process

State law requires that municipalities manage solid waste within their jurisdiction in conformance with the State Solid Waste Management Plan (now referred to as Materials Management Plan or MMP). Each municipality, either as an individual town or through a solid waste district or alliance, must adopt a Solid Waste Implementation Plan (SWIP) that is in conformance with the MMP. All towns, solid waste districts and alliances are collectively referred to as Solid Waste Management Entities (SWMEs).

All SWIPs must address all requirements outlined in 24 V.S.A. § 2202a, which are listed below.
Existing SWIPs, adopted in conformance with the 2014 State Materials Management Plan, will have to be revised to conform to this 2019 MMP.

To make the SWIP drafting process as easy as possible, ANR created a **SWIP Template** that requires no specific expertise to fill out. ANR Solid Waste Program staff are available to guide and assist SWMEs with SWIP drafting.

Minimum SWIP requirements:

1. **SWME Performance Standards.** SWIPs must address how each SWME Performance Standard is/will be completed during the SWIP term. SWIPs that adequately address the SWME Performance Standards are considered to be implementing the priorities of this MMP, as further outlined by 10 V.S.A. § 6604(a)(1). SWME Performance standards include all the requirements from 24 V.S.A. § 2202a.
2. **Solid Waste Facility Siting Criteria.** Describe siting criteria that will apply to solid waste facilities which may be proposed by any public or private entity in the SWME region. As required by 10 V.S.A. §6605(c), siting criteria shall not be less stringent than the criteria in Vermont Solid Waste Management Rules.
3. **Specify the Facilities that are Included in the SWIP and Describe How Proposed Facilities will be Reviewed for Inclusion.** Explain the process and standards to be used to determine if newly proposed solid waste facilities would be included in the SWIP. The process may reference siting criteria and existing zoning ordinances, may require a host town agreement, or may defer to requirements in the Vermont Solid Waste Management Rules for some or all types of solid waste facilities. The standard(s) for being included in the SWIP should be clear.
4. **Public Participation in the SWIP Approval Process.** Describe the process to be used to ensure public participation in the development and implementation of the SWIP. The local community should be notified of opportunities to participate in the SWIP development and implementation. In accordance with state statute, SWMEs must hold at least two public meetings on the draft SWIP.
5. **Ordinances.** Include copies of any solid waste related ordinances with the SWIP.
6. **Conformance with Other Plans.** Demonstrate that the SWIP is in conformance with any regional plan adopted in accordance with 24 V.S.A Chapter 117. Demonstration may be in the form of a letter from the applicable regional planning commission regarding conformance of the solid waste implementation plan with the regional plan(s), copies of pertinent sections of the regional plan(s), or other documentation that proves conformance.
7. **SWIP Reports.** All SWMEs must submit an annual SWIP Report on their Performance Standards and demonstrate completion of all required activities via ReTRAC by July 1st. ANR will provide SWIP Reporting Guidance.

SWIP Approval Process:

1. SWMEs must submit a draft SWIP to ANR by July 1, 2020 that is in conformance with the 2019 MMP.
2. Solid Waste Program staff will review the SWIP and send a letter outlining any unmet requirements.
3. SWMEs are responsible for submitting revised SWIPs within 30 days to address unmet requirements.

4. If the revised SWIP completely addresses all comments in the letter, ANR will recommend it for pre-approval. If the revised SWIP does not address all the comments, a follow-up review letter will be sent and the SWME will have another 30 days to address all comments in a subsequent revision.
5. Once a draft SWIP is recommended by ANR for pre-approval, the SWME must hold two public hearings in its region on the draft SWIP.
6. Upon completion of two public hearings and provided that no changes were made to the pre-approved SWIP, the SWME Board of Supervisors, Select Board or City Council may adopt the draft SWIP, which can then move toward full approval by ANR.
7. The following must be provided by the SWME as proof that public meetings were held in order to move toward final approval:
    a. dates of at least two public meetings that were held by the SWME warning the draft SWIP, and
    b. a summary of the meetings.
8. If no changes were recommended on the draft SWIP at the public meetings, then it can move forward for final approval from ANR. The ANR, DEC, Waste Management and Prevention Division Director will provide final approval of SWIPs via an ANR approval letter. If the draft SWIP is revised in any way, ANR will need to review the changes before moving it forward for final approval.

Possible Enforcement Actions:

SWMEs that have not adopted or implemented a SWIP in conformance with the MMP face consequences that may include:

a) An enforcement action pursuant to 10 V.S.A. Chapter 201 or 211,
b) The loss of grant eligibility,
c) Preclusion to secure solid waste management facility certification, and
d) A requirement to manage all disposed materials out of State.

Performance Standards

These performance standards were created to provide Vermonters with the greatest amount of information and convenience to reduce, reuse, recycle, compost, and safely dispose of as much of their materials as possible.

These performance standards reflect the effective actions that ANR and SWMEs can take to reduce waste in both volume and toxicity.

ANR PERFORMANCE STANDARDS

ANR – GENERAL STANDARDS

Fully implementing this MMP will assist with reaching state goals outlined below, however it is anticipated that other additional initiatives will be needed to fully achieve these goals. ANR will continue to work with stakeholders and partners to meet state materials management goals.

A1 – Waste Reduction and Diversion Goals

1. **REDUCTION GOAL: 10% decrease in annual material generation by the fifth year of the plan period. (Disposal + Diversion = Generation). Therefore, a goal of 606,063 tons generated per year in 2024, or less, as calculated from the 2018 Diversion and Disposal (D&D) Report baseline of 630,851 tons of waste (and recyclables) generated in Vermont that year.** The long-term goal is for Vermonters to consume fewer resources, waste less, and reuse more.

2. **DISPOSAL GOAL: 25% decrease in the annual waste each Vermonter disposes by the fifth year of the plan period. Therefore, a goal of no more than 1,000 pounds of MSW disposed per person per year in 2024, or less, as calculated from the 2018 D&D Report baseline of 436,166 tons of waste disposed in Vermont that year (436,166 tons waste disposed per year ÷ 626,299 population of VT in 2018 x 2,000 = 1,392.84 x .25 = 348.2 – 1,392.84 = ~1,000 pounds per person per year).**

3. **DIVERSION GOAL: 50% Recycling/Composting Rate by the fifth year of the plan period,** up from 35% in 2018, with the goal of diverting more of the materials that are currently being disposed. The goal is to recycle and compost everything that has a market and is required by state law.

4. **FOOD RESCUE GOAL: 10% increase in food rescue over the five-year plan period. Therefore, a goal of 4,302 tons per year in 2024, or more, as provided by the Vermont Foodbank. This was calculated from the 2018 D&D Report baseline of 3,911 tons rescued in Vermont that year.** We acknowledge that the ultimate goal is to not waste or overproduce food.

   DOCUMENTATION:
   1. Goals tracked annually through ANR's Diversion and Disposal Reports.
   2. 2023 (5-year) VT Waste Composition Study to be used to measure success of recycling and organics diversion as well as evolving composition of the waste stream.
   3. Data on food rescue provided annually by Vermont Foodbank.

A2 – MMP Publicity

DOCUMENTATION:
1. Post MMP on Vermont's Waste Management website within a month of adoption.
2. Submit press release announcing new MMP within two months of adoption.

A3 – Public Media Education and Outreach

ANR will continue to conduct public media outreach on waste reduction and recycling and organics diversion requirements, household hazardous waste, construction and demolition waste, and extended producer responsibility programs (EPR). This could include both paid and unpaid advertisements, social media posts, press releases, and articles. Whenever possible, ANR will strive to develop consistent statewide messaging with stakeholders, including consistency with the Northeast and other U.S. states.

DOCUMENTATION:

1. Number of advertisements placed.
2. Number of press releases and articles published.
3. Social media engagement data.

A4 – Direct Business Outreach & Compliance

ANR will continue to conduct direct business outreach with SWMEs on waste reduction, recycling, food scrap diversion, food donation, EPR programs, and safe HHW & CEG hazardous waste management. The goal is to ensure compliance with state law and help meet waste reduction and diversion goals. Specifically, ANR will attempt to reach national chain businesses and those with headquarters outside of Vermont.

DOCUMENTATION:

1. Number of businesses contacted by phone or visited during the MMP term, minimum of 250 contacts.
2. Number of businesses that came into compliance with the Universal Recycling Law.

A5 – School Waste Reduction Outreach

ANR will provide support to SWMEs to assist schools with waste reduction and how to recycle and manage food scraps more effectively. ANR will work with the Agency of Education and other school organizations to ensure schools have information on waste reduction, recycling, organics diversion, and landfill ban disposal requirements. ANR will help schools safely manage hazardous materials.

DOCUMENTATION:

1. Number of schools assisted (EAO and DEC Solid Waste Program).
2. Number of presentations given at school-related conferences.
3. Total amount of grant funds provided, if applicable.

A6 – State Building Waste Reduction Outreach

ANR will provide guidance to state offices and building managers on waste reduction and how to recycle and manage food scraps more effectively. ANR will help them safely manage hazardous materials.

DOCUMENTATION:

1. Continue to support BGS and other state government agencies with recycling of mandated materials and diversion of food scraps in State leased and owned properties.

A7 – Solid Waste Facility and Hauler Compliance

ANR will continue to ensure solid waste haulers and facilities are compliant with State solid waste laws and rules, including Universal Recycling law landfill bans and collection requirements for mandated recyclables, leaf and yard debris, clean wood, and food scraps. ANR will respond to complaints of non-compliance and conduct routine inspections prioritizing the following facilities: larger capacity, and those whose certifications are due for renewal or have not been inspected recently. ANR will also conduct spot-checks for disposal of banned items in solid waste tipped at transfer stations and landfills.

DOCUMENTATION:

1. Number of resolved complaints.
2. Number of inspections.
3. Number of spot checks.

A8 – SWIP Compliance

DOCUMENTATION:

1. ANR will ensure that SWMEs continue to implement Solid Waste Implementation Plans (SWIPs) and complete annual performance standards through SWIP Reports. This includes reviewing and ensuring that variable rate pricing (VRP) systems are in place statewide.

ANR – RECYCLABLES

A-R1 – Recycling Market Development

In addition to the Reduction and Diversion Goals above, ANR will continue to collaborate with public and private stakeholders to improve North American markets for recyclables, especially lower value recyclables like glass and mixed paper.

DOCUMENTATION:

1. Participate in local, regional, and national discussions about materials management and share recycling market information to stakeholders when it is pertinent and can help improve recycling markets.
2. Outreach on the importance of buying and producing products and packaging with post-consumer recycled content (PCR).
3. Number of tons of recyclables reported/tracked annually in Diversion and Disposal Reports.

ANR – ORGANICS (FOOD/FOOD SCRAPS, LEAF/YARD, CLEAN WOOD)

A-O1 – Compost Market and Collection Infrastructure Development

In addition to the Reduction and Diversion Goals above, ANR will continue to collaborate with public and private stakeholders to improve domestic (Vermont, Northeast, and U.S.) markets for compost.

DOCUMENTATION:

1. Number of participants in the Master Composter courses.
2. Number of attendees at the Vermont Organics Recycling Summits.
3. Number of contracts for Compost Technical Assistance and Operator Trainings offered.
4. Participate in local, regional, and national discussions about materials management and share compost market information to stakeholders when it is pertinent and can help improve compost markets.
5. Number of tons of organics reported/tracked annually in Diversion and Disposal Reports.
6. Number of collaborative meetings and/or demonstration projects held with Regional Planning Commissions, municipal representatives, SWMES, AAFM, AOT and other state agencies on the use of finished compost on farms, state owned properties and in road projects and other applications or development of infrastructure and capacity for processing organics.

A-O2 – Food Scrap Drop off Development and Support

In order to ensure that convenient collection locations exist for residential food scraps, ANR will confirm compliance and the adequacy of solid waste facility/transfer station drop off collection and that there is awareness among residents that it is available.

DOCUMENTATION:

1. Complete confirmation of compliance with food scrap drop off collection 2 times during the Plan term.

A-O3 – Residential Curbside Food Scrap Collection

ANR will collaborate with SWMEs to hold regional meetings with haulers and stakeholders to support development of residential food scrap collection businesses.

DOCUMENTATION:

1. ANR will hold a minimum of 8 regional hauler stakeholder meetings during MMP term.

A-O4 – Food Rescue Support

ANR will continue to support and collaborate with others on food rescue and donation to put quality, usable food to its highest and best use.

DOCUMENTATION:

1. Number of presentations given in support of food rescue.
2. Number of meetings with food rescue groups such as the Vermont Foodbank.
3. Number of meetings with grocers and other generators of potentially donatable food.

ANR – HOUSEHOLD HAZARDOUS WASTE, CEG HAZARDOUS WASTE, EPR MATERIALS, AND UNIVERSAL WASTE

A-H1 – HHW/CEG Hazardous Waste Collection

ANR's goal is to reduce toxicity in the waste stream by preventing toxics use and providing convenient and cost-effective collection systems for household hazardous waste (HHW) and conditionally exempt generator (CEG) hazardous waste. ANR will continue to evaluate, with SWMEs and other stakeholders, the most cost effective, convenient, and efficient method(s) to collect and manage HHW, such as through collection facilities, events, and/or EPR and product stewardship programs for all residents.

DOCUMENTATION:

1. Amount of HHW collected and participation rate for HHW facilities and events.
2. Continued dialogue with HHW Stakeholders.
3. Number of HHW Network Group meetings coordinated.
4. Reports on HHW to the Legislature, if any.
5. Total grant funding allocated for HHW events, research, and collection costs.
6. Statewide outreach campaign promoting the reduction in use of hazardous products and encouraging proper disposal.

A-H2 – Sharps and Pharmaceutical Disposal

ANR will participate in the Sharps Disposal Task Force and the Unwanted Pharmaceutical (Drug) Disposal Task Force led by the VT Department of Health to encourage people to dispose of sharps and pharmaceuticals in the safest and most cost-effective manner and to determine the most convenient and effective collection systems.

DOCUMENTATION:

1. Post the most up-to-date methods for sharps and pharmaceutical disposal on the DEC website and disseminate information to SWMEs and other stakeholders.
2. Participate in discussions with Dept of Health and other stakeholders.

A-H3 – EPR Program Implementation

ANR will continue to support the implementation of Vermont's Extended Producer Responsibility programs for electronics, paint, batteries, and mercury-containing bulbs and thermostats.

DOCUMENTATION:

1. Annual collection rates per EPR program.

ANR – CONSTRUCTION & DEMOLITION (C&D)

A-C1 – Encourage C&D Waste Prevention, Diversion, and Recycling Markets

ANR will promote C&D waste prevention and diversion practices and continue to encourage the development of new recycling market outlets for clean wood, asphalt shingles, scrap metal, drywall, plywood, and oriented strand board in Vermont and regionally. ANR will provide guidance for SWMEs in meeting the MMP requirement to offer collection locations for asphalt shingles for the purpose of recycling these materials. ANR may suspend these standards upon finding that insufficient markets exist for these materials. As funding allows, ANR will consider grants for asphalt shingle and drywall collection infrastructure.

DOCUMENTATION:

1. Number of meetings attended or presentations given to Vermont building community and other related organizations.
2. Number of Act 250 Construction Site Waste Reduction Plans reviewed. ANR will share with SWMEs the C&D diversion plans in each region.
3. Annual growth, in tons, of C&D recycled at Architectural Waste Recycling Facilities.
4. Number of best management practices, guidance, or policies issued with DEC assistance on C&D materials recycling and reuse.

ANR – RESIDUALS – BIOSOLIDS, WOOD ASH, SHORT PAPER FIBER

A-RES 1 – Residuals Recycling Meetings

Historically, ANR has sought to achieve a 75% beneficial reuse rate of residual materials like biosolids, stabilized septage, short-paper fibers, and wood ash. To encourage this goal, ANR Residuals Program staff will work with SWMEs and other stakeholders to organize up to 12 regional meetings on residuals recycling around the state. The meetings will educate and promote the exchange of information to improve safe and effective reuse opportunities for residuals. ANR will also continue to improve its rules to reduce costs for facility operators while ensuring effective management of residuals.

DOCUMENTATION:

1. Number of Residuals Recycling Meetings organized and attended.

SWME PERFORMANCE STANDARDS

GENERAL STANDARDS

G1 – Disposal and Diversion Reporting

1. **DISPOSAL RATE:** To track progress with state waste reduction goals, SWMEs must report their disposal rate in SWIP years one and five. SWMEs may use the method in the *ANR Data Guidance* to calculate their disposal rate or another method approved by ANR. Disposal rate reports must be based on calendar year data and be submitted to ANR via ReTRAC by July 1st.
   DOCUMENTATION:
   1. First (1st) Year SWIP Report: report year 1 annual per person per year disposal rate.
   2. Fifth (5th) Year SWIP Report: report year 5 annual per person per year disposal rate.

2. **DIVERSION RATE:** SWMEs are not required to report diversion rates to ANR; however, it is strongly recommended that SWMEs track their diversion efforts to determine the success of their programs and services.

G2 – SWIP Posting & Publicity

To ensure community members are aware of and can access the SWIP, each SWME must—within one month of their SWIP approval—post their approved SWIP on their website and submit one press release about their SWIP to local newspapers within two months of SWIP approval.

DOCUMENTATION:

1. First (1st) Year SWIP Report: supply website link of SWIP and attach press release along with date released and list of newspapers where it was sent.

G3 – A-Z Waste & Recycling Guide

To ensure community members have access to local information on state disposal bans and how to reuse, recycle, donate, compost, and safely dispose of their unwanted materials, each SWME will develop and maintain an A-Z guide on their website that lists regional management options for various materials. This guide must be updated on the SWMEs website within the first SWIP year and remain accurate throughout the SWIP term. The list must contain, at minimum, information on how to manage, recycle, or divert all state disposal banned items in addition to information on where to recycle/reuse the following materials: clothing/textiles, asphalt shingles and drywall, sharps, pharmaceuticals, and food for donation.

DOCUMENTATION:

1. Provide A-Z website link in annual SWIP report.
2. A-Z website link must be easily found from the district, alliance or town's website within 2 clicks or fewer from the homepage.
3. Publicize the A-Z Waste & Recycling Guide with at least two forms of outreach annually throughout the SWIP term.

G4 – Variable Rate Pricing

SWMEs must implement a variable rate pricing system that charges for the collection of municipal solid waste from a residential customer for disposal based on the volume or weight of the waste collected.

DOCUMENTATION:

1. In annual SWIP report, explain the method used to ensure haulers and facilities are charging residents for trash based on volume or weight.

G5 – Solid Waste Hauling Services

To ensure community members have access to information on solid waste hauling services in their region or town, SWMEs must annually update the contact information and trash, recycling, and food scrap pickup services offered by all commercial solid waste haulers operating within their region on the SWME website. SWMEs may elect to establish licensing or registration programs to accomplish this requirement.

DOCUMENTATION:

1. In annual SWIP report, provide website link to hauler contact list and services haulers provide.

OUTREACH – RECYCLING, ORGANICS, HHW/CEG, EPR PROGRAMS

O1 – School Outreach

To ensure all K-12 public and private school children, faculty and staff understand state disposal bans and how to reduce waste, reuse, recycle, compost, donate, and safely manage materials responsibly, **SWMEs must annually visit and work with K-12 public and private schools to implement school-wide waste reduction programs — covering, at minimum, disposal ban information, how to recycle correctly, how to separate food scraps for composting, how to reduce wasted food and donate what is appropriate, how to safely manage hazardous waste, and collection options available from Vermont's Extended Producer Responsibility Programs for electronics, paint, batteries, mercury-containing bulbs and thermostats.** SWMEs must assist schools on a continual basis to ensure the effectiveness of waste reduction programs.

SWMEs must conduct in-person outreach and education assistance to at least 10% or 2 schools (whichever is greater) within their jurisdiction each year, ensuring that at least 50% of the schools are reached by the end of the SWIP term. SWMEs should prioritize outreach to schools that have not yet been visited. For SWMEs with fewer than 10 schools, assistance should be offered on an annual basis to at least 2 schools per year, with re-visits to schools if all schools in the jurisdiction are reached early in the SWIP term.

SWMEs may work with ANR's Environmental Assistance Office to obtain information and technical assistance on HHW/CEG handling, disposal, waste reduction, recycling, and finding cost effective disposal options.

DOCUMENTATION

1. Provide a list of schools contacted, dates visited, informational materials provided (such as VT Waste Not Guide), technical assistance or outreach offered, and status of recycling and food scrap diversion programs in annual SWIP report.

O2 – Direct Business Outreach

To ensure businesses and institutions (hospitals, nursing homes, colleges, correctional facilities, and other large waste generators) understand how to meet State requirements and reduce waste, recycle, compost, donate food/goods, and safely manage materials responsibly, **SWMEs must annually conduct business outreach and education either in person or via phone — covering, at minimum, disposal ban information, how to recycle correctly, how to separate food scraps for composting, how to reduce wasted food, how to safely manage hazardous waste, and collection options available from Vermont's Extended Producer Responsibility Programs for electronics, paint, batteries, mercury containing bulbs and thermostats.** SWMEs must provide business outreach and education on a continual basis to ensure the effectiveness of waste reduction programs.

SWMEs must conduct business outreach and education to at least 2% or 20 businesses/institutions (whichever is greater) within their jurisdiction each year and reach at least 10% of the businesses and institutions within their region by the end of the SWIP term. For SWMEs with fewer than 20 businesses, all businesses must receive outreach at least twice during the SWIP term.

SWMEs should prioritize outreach to businesses that have not yet been contacted or visited or those whose status is not yet known.

DOCUMENTATION

1. In annual SWIP report, provide list of businesses/institutions contacted, date contacted, outreach materials provided (such as the VT Waste Not Guide), and the status of recycling and food scrap diversion programs and whether follow up is needed.

O3 – Waste Reduction at Events

To ensure community members have resources to reduce waste, recycle, and divert food scraps from the trash at events, SWMEs must, at minimum, offer technical assistance which could include signage and coordination with local haulers and facilities accepting food scraps. Though not required, SWMEs are encouraged to host waste-sorting stations at events with SWME staff or volunteers or to loan community members basic supplies such as signage and collection bins.

DOCUMENTATION

1. Provide information on SWME or town website of event waste reduction and diversion resources and services and provide link in annual SWIP report.
2. In annual SWIP report, list events that have received assistance each year.

HHW & CEG HAZARDOUS WASTE

H1 – HHW Collection Events and Facilities

To ensure community members have convenient access to safely dispose of Household Hazardous Waste (HHW) and Conditionally Exempt Generator Hazardous Waste (CEG), SWMEs must provide a minimum of two (2) HHW/CEG hazardous waste collection events per year or access to a permanent HHW collection facility defined within this MMP as a facility that is open at least one day per week and open at minimum from May through October (ANR may consider approving requests for alternative operating days and seasonal openings and closures of permanent facilities when necessary). SWMEs that provide access to a permanent HHW collection facility in their region, are exempt from the requirement to offer all towns at least one annual collection event within 20 road-miles.

Minimum Requirements for SWMEs utilizing Collection Events: SWMEs must offer at least one event scheduled in the spring and one in the fall and events must operate for a minimum of 4 hours. SWMEs who only offer collection events or operate HHW facilities with operating hours similar to collection events must annually provide each of its towns with access to at least one collection event (or to a facility) within 20 road-miles; meaning a maximum distance of 20 road-miles from any point in the town. If a SWME provides additional events above the minimum requirement, waivers to the minimum duration for each event may be considered by ANR. To meet this 20 road-mile convenience requirement, certain regions may need to add collection events.

SWMEs may share access to events and facilities provided a signed agreement confirming access by the SWME's community members is obtained; and provided that an event or facility is within 20 road-miles from any point in a town that would be using that event or facility.

In the event an EPR Program is established for certain HHW materials, SWMEs would be required to ensure that collection exists for all other HHW materials not covered by the HHW EPR Program and to meet and maintain the above HHW collection and convenience standards.

DOCUMENTATION

1. In annual SWIP report, provide dates of events or link to facility hours on SWME website, number of participants and the amount of HHW/CEG hazardous waste collected.

H2 – Collection of Landfill-Banned and Dangerous Materials

Each SWME shall demonstrate that year-round collection options exist in their region for the following materials: **batteries, mercury containing lamps, mercury thermostats, 1- and 20-pound propane tanks, electronics, paint, tires, used oil, and white goods (including discarded refrigerators, washing machines, clothes dryers, ranges, water heaters, dishwasher, freezers)**. Collection locations can be privately or publicly owned, such as auto parts stores collecting used oil, or hardware stores collecting paint and fluorescent lamps. However, if the only collection location for a required material closes during the SWIP term, then the SWME must provide a collection option for its residents. All collection locations must be open at least one weekday and one weekend day per week. In addition, all outreach promoting the collection of these materials must make clear that the collection of these materials is separate from curbside, or blue-bin, recycling.

DOCUMENTATION

1. In annual SWIP report, provide link to SWME's A-Z Guide's listings with name, location, phone number, and website (if available) of the locations, by material type.

FOOD DONATION

F1 – Food Rescue

To ensure community awareness of food donation centers, SWMEs must, at minimum, list food donation groups on their website (this can be part of the A-Z Guide). SWMEs should contact and collaborate with local food redistribution groups to conduct outreach and education to food businesses and institutions about opportunities to donate quality food within the region to feed people. Related groups include Vermont Foodbank, hunger councils, food shelves, churches, schools, and other nonprofit and community organizations that accept and distribute donated food items.

DOCUMENTATION

1. In annual SWIP report, provide link to SWME's A-Z Guide's food donation listing, with name, location, phone number, and website (if available) of the food donation centers.

TEXTILES

T1 – Textile Reuse and Recycling

To ensure community members have access to textile reuse and recycling centers where used clothing can be donated, SWMEs must annually ensure that at least one collection location exists within their region. Textile reuse/recycling locations can be either privately or publicly owned. However, if the only collection location closes or ceases collection during the SWIP term, then the SWME is responsible for providing a collection option for its residents or partnering with another group that may coordinate an annual drop and swap event. Collection locations can also be shared amongst SWMEs so long as the facility is within the same county or SWME region. SWMEs must list where to donate and reuse/recycle "clothing/textiles" in their A-Z Guides.

DOCUMENTATION

1. In annual SWIP report, provide link to SWME's A-Z Guide's textiles reuse and recycling listing with name, location, phone number, and website (if available) of the textile reuse and recycling center.

CONSTRUCTION & DEMOLITION

C1 – Leaf, Yard, and Clean Wood Debris Recycling

To ensure community members have options to recycle leaf, yard, and clean wood debris that are banned from landfill disposal, SWMEs must annually ensure that at least one leaf, yard, and clean wood recycling collection location exists within their jurisdiction. This location can be either privately or publicly owned; however, if the only collection location closes or ceases collection during the SWIP term, then the SWME must provide a

collection option for its community members. SWMEs must list where to drop off clean wood in their A-Z Guides. Recycling options can include dimensional lumber that is reused, clean wood that is burned to produce heat and/or power for buildings (including wood stoves), clean wood that is chipped to create mulch or compost feedstocks, and other options listed in the state's Leaf, Yard, and Clean Wood Debris Guide. Collection locations should be co-located with solid waste facilities that collect C&D and trash to make clean wood recycling convenient.

DOCUMENTATION:

1. In annual SWIP report, provide link to SWME's A-Z Guide's clean wood recycling listing with name, location, phone number, and website (if available) of the collection location.

C2 – Asphalt Shingles and Clean Drywall Recycling

Asphalt Shingles Recycling: To ensure community members have options to recycle asphalt shingles, SWMEs must ensure that at least one recycling collection location exists within their region. Collection locations can be privately or publicly owned. However, if the only recycling collection location closes during the SWIP term, then the SWME must provide a collection option. Collection locations may be shared amongst SWMEs. ANR may suspend this requirement upon finding that insufficient markets exist for these materials.

Clean Drywall Recycling: To promote the recycling of clean drywall, SWMEs must list where to drop off clean drywall for recycling in their A-Z Guides (even if drywall recycling collection locations are outside of the SWME region). To encourage development of options for drywall recycling collection, SWMEs must contact drywall recycling collectors once during the SWIP term to determine costs for obtaining drywall recycling collection services in their region.

DOCUMENTATION:

1. In annual SWIP report, provide link to SWME's A-Z Guide's asphalt shingles and drywall recycling listing with name, location, phone number, and website (if available) of these recycling collection locations.
2. Fifth (5th) Year SWIP Report: describe contact made to drywall recyclers for costs for recycling option.

RESIDUALS – BIOSOLIDS, WOOD ASH, SHORT PAPER FIBER

R1 – Residuals Recycling Meetings

To promote the recycling of residual materials, each SWME must attend and help ANR Residuals Program staff host and coordinate at least one regional public meeting on residuals recycling during the SWIP term. ANR Residuals Program staff will help SWMEs organize the meetings, give a presentation, and identify speakers and invitees. SWMEs must reserve a space to hold the meetings and send invitations to water/wastewater and public works employees, town managers, select board members, septic and biosolids service providers, citizens, industrial waste generators, and others as appropriate. ANR Residuals Program staff will collaborate with SWMEs to develop a meeting agenda that best suits the needs or issues of the region and its towns. Meeting agendas could cover the benefits and challenges of recycling biosolids and other residual materials, like stabilized septage, wood ash, and short paper fibers, as well as education campaigns for the public on residual materials and keeping non-flushables and toxics out of the wastewater stream and septic systems.

DOCUMENTATION:

1. Collaborate with Residuals staff to host/coordinate regional public meeting on residuals recycling.
2. Report date of meeting and list of attendees in 5th year SWIP report.

Glossary of Terms

DISCLAIMER - The Glossary of Terms does not provide legal definitions of all terms. Instead, the intent is to provide consistent definitions of key words used in this Plan so that all readers have the same understanding of these terms as used in the context of this Plan.

Anaerobic Digestion: means the controlled anaerobic decomposition of organic food residuals, manure, animal feed waste, other natural organic waste materials inside a containment structure or vessel, generally resulting in the production of methane-rich gas. The initials "AD" may refer to the process of anaerobic digestion or the built system where anaerobic digestion takes place, also known as a digester.

Biogas: gas produced by the breakdown of organic material in the absence of oxygen.

Biosolids: primarily organic materials recovered from the wastewater treatment process and sewage sludge, both of which have been treated and shown to meet the standards such that it can be managed through beneficial use. Beneficial use includes land application or further treatment to produce compost or similar products. Disposal includes dewatering followed by landfilling or incineration.

Clean wood: has the same definition as "wood waste" in state statute and means trees, untreated wood, and other natural woody debris, including tree stumps, brush and limbs, root mats, and logs.

Conditionally Exempt Generator (CEG): a generator of hazardous waste that is conditionally exempted from certain provisions of the Vermont Hazardous Waste Management Regulations.

Composting: the controlled biological decomposition of organic matter through active management to produce a stable, humus-rich material.

Construction and Demolition (C&D) debris: means waste derived from the construction or demolition of buildings, roadways or structures including but not limited to clean wood, treated or painted wood, plaster, sheetrock, roofing paper and shingles, insulation, glass, stone, soil, flooring materials, brick, masonry, mortar, incidental metal, furniture and mattresses. This waste does not include asbestos waste, regulated hazardous waste, hazardous waste generated by households, hazardous waste from conditionally exempt generators, or any material banned from landfill disposal under 10 V.S.A. §6621a.

Disposal: the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or onto any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any ground or surface waters.

Diversion Rate: the measurement of the amount of waste 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.

That is calculated by using the following equation:

$$\text{Diversion Rate (\%)} = \frac{\text{tons diverted}}{\text{tons diverted + disposed}} \times 100 = \frac{\text{tons reused + composted + recycled}}{\text{tons reused + composted + recycled + landfilled + incinerated}} \times 100$$

Energy recovery (as it relates to the Food Recovery Hierarchy): Energy recovery as it relates to the food residual hierarchy does not include disposal by incineration, waste-to-energy incineration, or other such processes.

Extended Producer Responsibility (EPR): a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations in the design of their products and packaging.

Food Scraps/Residuals: source-separated and uncontaminated material that is derived from processing and discarding of food and that is recyclable; may include pre-consumer and post-consumer food scraps but does not necessarily include meat and meat-related products when the food residuals are composted by a resident on site.

Household Hazardous Waste (HHW): any waste from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day-use recreation areas) that would be subject to regulation as hazardous wastes if it were not from households. Examples of HHW include paint, cleaners, oils, batteries, and pesticides. Because they contain potentially hazardous ingredients, these wastes require special management.

Leaf and yard debris: source-separated compostable, untreated vegetative matter, including grass clippings, leaves, kraft paper bags, and brush, which is free from non-compostable materials. It does not include such materials as pre-consumer and post-consumer food residuals, food processing residuals, or soiled paper.

Mandated recyclable: any of the following source separated materials: aluminum and steel cans; aluminum foil and aluminum pie plates; glass bottles and jars from foods and beverages; polyethylene terephthalate (PET) plastic bottles or jugs; high density polyethylene (HDPE) plastic bottles and jugs; corrugated cardboard; white and colored paper; newspaper; magazine; catalogues; paper mail and envelopes; boxboard; and paper bags.

Management facilities: Facilities that are permitted by ANR to accept materials for recycling, processing, or disposal.

Materials Management: the lifecycle of materials as they trace their course through the economy, from raw material extraction to product manufacture, transport, use, source reduction, reuse, recycling, and disposal. (USEPA www.epa.gov/statelocalclimate/state/topics/waste-mgmt.html).

Municipal Solid Waste (MSW): combined household, commercial, and industrial waste materials generated in a given area.

Organic Materials: materials of a biological origin such as paper and cardboard, food, yard and garden waste, animal waste, biosolids and septage. For this MMP, biosolids and septage are discussed separately from other organic materials. Animal waste is not a subject addressed in this MMP.

Per Person Disposal Rate: the average amount of waste disposed (landfilled or incinerated) per person in a given year. Or, when expressed as an equation:

Per Person Disposal Rate =	(total tons landfilled + total tons incinerated) per year by a given town or district or state / total population of that town or district or state (may be adjusted for seasonal population)

Plan term: the period of time by which the Materials Management Plan designates the earliest and latest possible date at which a performance standard must be completed. This term is scheduled for a 5-year period beginning on the date of adoption.

Product Stewardship*:* the act of minimizing health, safety, environmental, and social impacts of a product and its packaging, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The producer of the product has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role. Product stewardship can be either voluntary or required by law.

Recyclable Materials: solid waste which may be reclaimed and/or processed so that they may be used in the production of materials or products.

Recycling: the process of utilizing product residuals, packaging, or food scraps for the production of materials or products but does not include processing solid waste to produce energy or fuel products.

Recycling Rate: the percentage of material recycled compared divided by the sum of recycled and disposed material, multiplied by 100. Or, when expressed as a formula:

$$\text{Recycling Rate (\%)} = \frac{\text{tons of materials recycled}}{\text{(tons of materials recycled + tons of waste disposed)}} \times 100$$

ReTRAC: a database used to manage all diversion and disposal reports for the State of Vermont. Data can be tracked and reports run based upon facility, material, or region.

Reuse: use of a material or product more than once before it is recycled or discarded as solid waste.

Septage: the liquid and solid materials pumped from a septic tank or cesspool during cleaning.

Sludge: any untreated solid, semisolid, or liquid generated from a municipal, commercial, or industrial wastewater treatment plant or process, water supply treatment plant, air pollution control facility, or any other such waste having similar characteristics and effects.

Solid Waste (SW): any discarded garbage, refuse, or septage, or sludge from a waste treatment plant, water supply plant, or pollution control facility and other discarded material including solid, liquid, semi-solid, or contained gaseous materials resulting from industrial, commercial, mining, or agricultural operations and from community activities but does not include animal manure and absorbent bedding used for soil enrichment or solid or dissolved materials in industrial discharges which are point sources subject to permits under the Water Pollution Control Act. Solid waste that is also hazardous waste is subject to further regulation under the Vermont Hazardous Waste Management Regulations.

Solid Waste Implementation Plan (SWIP): that plan which is adopted to be consistent with the State Materials Management Plan (MMP). This plan must include all the elements required for consistency with the MMP and an applicable regional plan and shall be approved by the Secretary. This implementation plan is the basis for state certification of facilities.

Solid Waste Management: activities that result in the storage, transportation, transfer, treatment of solid waste or recyclable material, or disposal of solid waste.

***Solid Waste Management Entity (SWME)*:** a term used to reference a town or groups of towns that have unified as a district, group, or alliance in order to share financial and human resources dedicated to managing the solid waste generated by organizations and residents residing within the particular town or group of towns.

SWIP term: the term in which a Solid Waste Implementation Plan (SWIP) is approved by ANR until the time a new SWIP is approved following the adoption of a new MMP (referred to as a "solid waste management plan" by statute) or a revised SWIP is approved by ANR.

Transfer Station: a solid waste management facility where solid waste is collected, aggregated, sorted, stored, and/or processed for the purpose of subsequent transfer to another solid waste management facility for further processing, treatment, transfer, or disposal.

Universal Waste: establishes alternative management standards for certain hazardous wastes in order to streamline the management process. Examples of Universal Wastes are batteries, pesticides, thermostats, PCB-containing fluorescent light ballasts, lamps, mercury-containing devices, paint, and cathode ray tubes.

Variable Rate Pricing (or Unit Based Pricing or Pay As You Throw): Charging a tiered or variable fee based on the volume or weight of the solid waste collected.

Waste: a material that is discarded or is being accumulated, stored, or physically, chemically, or biologically treated prior to being discarded, or has served its original intended use or is a manufacturing or mining by-product, and is normally discarded.

Waste Prevention: actions or choices that prevent the generation of waste. Waste prevention involves altering the design, manufacture, purchase, or use of products and materials to reduce the amount and toxicity of what gets thrown away.

Waste Reduction: waste reduction combines the efforts of waste prevention, reuse, composting, and recycling practices.