

**2025 CLASS II RECYCLING PROGRAM
WASTE CHARACTERIZATION SCOPE AND METHODOLOGY GUIDANCE**

Combustion Facilities with Class II Recycling Programs are required to conduct a waste characterization study (WCS) within 18 months of receiving their Class II Recycling Program approval from MassDEP and every three years thereafter. The last study was conducted in calendar year 2022. The next study must be conducted in 2025. Each facility's permit states that MassDEP will provide guidance on the scope, methodology and protocols to be used in conducting the study. Combustion facilities are responsible for submitting a proposed waste characterization study design to MassDEP within 30 days of MassDEP's issuance of the revised guidance. MassDEP will review these proposed study designs and approve a final WCS design for each facility.

The purpose of the WCS is to:

1. characterize the solid waste disposal stream at the Facility,
2. provide statewide characterization information,
3. allow MassDEP to utilize the information to measure the success of waste reduction efforts,
4. identify specific materials for increased diversion, and
5. help guide MassDEP policy and program initiatives in solid waste management.

Combustion facilities are required to conduct additional waste characterization studies every three years. MassDEP reserves the right to amend the scope of future WCSs based on priorities and objectives of MassDEP as outlined in the Solid Waste Master Plan.

For Combustion Facilities' 2025 WCS the following guidance is provided:

I. Scope

The initial WCS including all analysis and reporting is required by the WEC permit modification to be completed by no later than February 15, 2026. The WCS will provide a statistically defensible measure of the composition of unprocessed solid waste received at the facility by employing manual sorting of representative samples collected from the residential and industrial, commercial and institutional (ICI) sectors of the solid waste stream in MA. Facilities shall follow the methodologies and protocols described in ASTM Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste - D 5231 – 92 (2016) unless otherwise approved by MassDEP.

II. Methodology

Facilities shall provide a detailed explanation and procedure for approval by MassDEP for the following:

1. Sampling Periods:

Waste samples are to be obtained in numbers equal to the proportion of waste received over the course of a minimum of two seasons. The first season shall be from April 15, 2025, to June 15, 2025. The second season shall be from July 15, 2025, to September 15, 2025. The presence of seasonally variable components in waste such as leaf and yard materials shall be included in the sampling plan, and other independent seasonally variable factors that introduce additional variation into the waste stream shall also be considered such as holidays and additional seasons.

2. Number and allocation of samples:

ASTM Test Method -D-5231-92 (2016) will be used to determine the number of samples necessary to achieve a 90% confidence interval that ranges 10% around the mean value. Samples will be

allocated proportionately between sources (residential and ICI) based on statewide data ($\pm 5\%$) unless the facility's incoming waste stream differs substantially from the statewide average below.

- ICI 55%
- Residential 45%

3. Vehicle Sampling:

Procedures for selecting vehicles will follow ASTM Test Method - D 5231 – 92 (2016). Vehicles selected will be grouped into sub stream sectors including Residential Waste, Industrial/Commercial/Institutional (ICI) Waste and Unacceptable as defined below:

- Residential – vehicles in which 80% or more of the waste is from residential sources (single family or multi-family). Typically these vehicles will include Residential Drop-off Containers (i.e. roll-offs, dedicate transfer trailers from municipal drop-off programs), Rear-load Packers and automated Side Loaders.
- ICI – vehicles in which 80% or more of the waste is from ICI sources. Typically these vehicles will include Compactor Boxes, Open Top Boxes and Front-load Packers
- Unacceptable Loads – loads that contain less than 80% of either residential or ICI waste, loads that are more than 50% construction and demolition material, and loads originating from out of state. The number of unacceptable loads should be identified and documented.

4. Load Sample Selections:

ASTM Test Method - D-5231-92 (2016) will be used to select samples from vehicles. Each sample shall be no less than 225 lbs.

5. Sorting Samples:

ASTM Test Method - D-5231-92 (2016) will be used to sort samples. Samples selected will be sorted into the waste categories listed in Attachment A. Measurements of volumes and weights of materials sorted shall be recorded for each sample along with source information.

III. Final Report

The final waste characterization study report shall be provided to MassDEP on or before February 15, 2026 and shall include at a minimum the following:

1. Final Design: An account of the variations included in the sampling period, the number and allocation of samples categorized, the overall vehicles sampled, loads sampled, and final sort design
2. Overall Composition of Waste: A summary account of the overall composition of the waste stream measured by the WCS. This should also describe the abundance of each Primary Waste Category as a percentage of the waste stream
3. Composition by Sub-stream: A summary account of the overall composition of the waste stream measured by the WCS, including for both Primary Waste Categories and Secondary Waste Categories, a composition analysis listing the percentage that each material comprises of the following sectors waste loads:
 - Residential
 - ICI
4. Composition by Haul Type: A summary account of the overall composition of the waste stream measured by the WCS grouped by the following:

- Roll-off - open top
- Roll-off - closed top
- Roll-off – compactor
- Rear loading packer
- Front loading packer
- Transfer Trailers

5. Observations and Analysis

6. Raw data for each load sampled

7. Summary data in Microsoft Excel Format broken out by Secondary Waste Categories for:

- (2) Overall Composition of Waste,
- (3) Composition by Substream, and
- (4) Composition by Haul Type

ATTACHMENT A - Waste Categories

Primary Categories (9)

Paper, Plastics, Metals, Glass, Organic Materials, Construction and Demolition (in the MSW stream), Household Hazardous Materials, Electronics, Other Waste.

Secondary Categories (62)

Grouped by Primary Category as follows:

Paper

Uncoated Corrugated Cardboard/Kraft Paper means corrugated boxes or paper bags made from Kraft paper. Uncoated Corrugated Cardboard has a wavy center layer and is sandwiched between the two outer layers and does not have any wax coating on the inside or outside. Examples include entire cardboard containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces of boxes and cartons. This type does not include chipboard. Examples of Kraft paper include paper grocery bags, un-soiled fast food bags, department store bags, and heavyweight sheets of Kraft packing paper.

Waxed Cardboard means cardboard with wax coating on the inside or outside.

High Grade Office Paper means the type of paper that is free of ground wood fibers; usually sulfite or sulphate paper; includes office printing and writing papers such as white ledger, color ledger, envelopes, and computer printout paper, bond, rag, or stationary grade paper. This subtype does not include fluorescent dyed paper or deep-tone dyed paper such as a goldenrod colored paper.

Magazines/Catalogs means items made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light. Examples include glossy magazines, catalogs, brochures, and pamphlets.

Newsprint means the class or kind of paper chiefly used for printing newspapers – i.e. uncoated groundwood paper.

Other Recyclable Paper means paper, other than the paper mentioned above, which can be recycled. Examples include manila folders, manila envelopes, index cards, white envelopes, notebook paper, carbonless forms, junk mail, chipboard and uncoated paperboard, phone directories, non glossy catalogs, offshore cardboard and deep-toned or fluorescent dyed paper.

Compostable Paper means low grade paper that is not capable of being recycled, as well as food contaminated paper. Examples include paper towels, paper plates, waxed papers, egg cartons, pizza boxes, and tissues.

Remainder/Composite Paper means items made mostly of paper but combined with large amounts of other materials such as plastic, metal, glues, foil, and moisture. Examples include plastic coated corrugated cardboard, cellulose insulation, aseptic packages, polycoated (gable top) cartons, blueprints, sepia, onionskin, foiled lined fast food wrappers, frozen juice containers, carbon paper, self-adhesive notes, softcover and hardcover books, and photographs.

Plastics

PET Beverage Containers (non-MA deposit containers) means clear or colored PET beverage bottles other than MA deposit containers (water, flavored water, juice, sports drinks, etc.). When marked for identification, it bears the number —1 in the center of the triangular recycling symbol and may also bear

the letters —PETE or—PET. A PET container usually has a small dot left from the manufacturing process, not a seam.

PET Containers other than Beverage Containers (which originally contained non-hazardous material) means types of containers such as PET jars, rectangular PET containers used for produce; egg cartons, etc.

Plastic MA Deposit Beverage Containers means plastic beverage containers subject to MA's bottle bill and marked as deposit containers in Massachusetts.

HDPE Bottles, colored and natural, (which originally contained non-hazardous material) means natural and colored HDPE containers. This plastic is usually either cloudy white, allowing light to pass through it (natural) or a solid color, preventing light from passing through it (colored). When marked for identification, it bears the number —2 in the triangular recycling symbol and may also bear the letters—HDPE.

#5 PP Bottles & Containers includes bottles (other than those marked for MA deposit), tubs, lids, trays, clamshells and other containers labeled #5 PP.

Other Plastic Bottles & Containers (which originally contained non-hazardous material) means plastic bottles (other than those marked for MA deposit), tubs, tubes, trays, clamshells and other containers made of types of plastic other than PET, HDPE or PP. These containers are rigid (i.e., not expanded or film) plastic, and when marked for identification, may bear the number 3, 4, 6, or 7 in the triangular recycling symbol. This subtype also includes unmarked plastic containers.

Expanded Polystyrene Food Grade means “Styrofoam” products includes food packaging and finished products made of expanded polystyrene including cups, plates, trays, clamshells, etc.

Expanded Polystyrene Non-food Grade includes non-food packaging and finished products made of expanded polystyrene including packing peanuts and other packaging materials.

Bulk Rigid Plastic Items means plastic objects other than disposable package items. These items are usually made to last for a few months up to many years. These include the plastics used in children toys, furniture, plastic landscape ties, buckets, crates, pallets, sporting goods, etc.

Film (non-bag clean commercial and industrial packaging film) means film plastic used for large-scale packaging or transport packaging. Examples include shrink-wrap, mattress bags, furniture wrap, and film bubble wrap.

Grocery and other Merchandise Bags means plastic shopping bags, used to contain merchandise to transport from the place of purchase, given out by the store with the purchase. Includes dry-cleaning plastic bags intended for one-time use and other plastic film commonly recycled with grocery bags.

Other Film means plastic film Examples include garbage bags and other types of plastic bags (sandwich bags, zipper-recloseable bags, produce bags, frozen vegetable bags, newspaper bags), painting tarps, food wrappers such as candy-bar wrappers, mailing pouches, bank bags, X-ray film, metallized film (wine containers and balloons), and plastic food wrap.

Remainder/Composite Plastic means plastic that cannot be put in any other type or subtype. This type includes items made mostly of plastic but combined with other materials. Examples include auto parts made of plastic attached to metal, plastic drinking straws, foam packing blocks (not including expanded polystyrene blocks), plastic strapping, new plastic laminate (e.g., Formica), vinyl, linoleum, plastic lumber,

imitation ceramics, handles and knobs, some kitchen ware, plastic string (as used for hay bales), and plastic rigid bubble/foil packaging (as for medications); CD's, and rigid plastic housewares, such as mop buckets, dishes, cups, and cutlery.

Metals

Aluminum Beverage Containers (non-MA deposit containers) means beverage containers made from aluminum other than MA deposit containers.

Aluminum MA Deposit Beverage Containers means metal beverage containers subject to MA's bottle bill and marked as deposit containers in Massachusetts.

Tin/Steel Containers means rigid containers made mainly of steel, such as food and beverage containers. These items will stick to a magnet and may be tin-coated.

Other Aluminum – includes foil, food containers, aerosols (empty), etc.

Other Ferrous and non-ferrous means any iron or steel that is magnetic and metal items that are not magnetic (copper, brass, lead, zinc, etc). This subtype does not include "tin/steel containers". Examples include empty or dry paint cans, structural steel beams, boilers, clothes hangers, pipes, some cookware, security bars, scrap ferrous/nonferrous items, and galvanized items such as nails and flashing.

White Goods means appliances that employ electricity, oil, natural gas, or liquefied propane and to preserve or cook food; wash or dry clothing, kitchen utensils, or related items; or to cool or heat air or water. These are primarily encased in metal, and include items such as refrigerators, freezers, stoves, water heaters, propane/compressed tanks, water coolers, dishwashers, clothes dryers,, air conditioners, gas or electric ovens and ranges. White goods does not include microwaves.

Remainder/Composite Metal means metal that cannot be put in any other type. This type includes items made mostly of metal but combined with other materials and items made of both ferrous metal and nonferrous metal combined. Examples include microwaves, bikes, motors, insulated wire, and finished products that contain a mixture of metals, or metals and other materials, whose weight is derived significantly from the metal portion of its construction.

Glass

Glass Beverage Containers (non-MA deposit containers) includes wine bottles, nonalcoholic beverage containers, liquor bottles, etc.

Other Glass Packaging Containers (non-MA deposit containers) includes glass food and non-food containers such as sauces, jars, perfume containers, etc.

Glass MA Deposit Beverage Containers means glass beverage containers subject to MA's bottle bill and marked as deposit containers in Massachusetts.

Remainder/Composite Glass means glass that cannot be put in any other type. It may include items made mostly of glass but combined with other materials. Examples include Pyrex, Corningware, crystal, plate glass, window and door glass, , ceramics, porcelain, and other glass tableware, mirrors, non-fluorescent light bulbs, auto windshields, laminated glass, or any curved glass.

Organic Materials

Food Waste means food material resulting from the processing, storage, preparation, cooking, handling, or consumption of food. This type includes material from industrial, commercial, or residential sources. Examples include discarded meat scraps, dairy products, eggshells, fruit or vegetable peels, and other food items from homes, stores and restaurants. This type includes apple pomace and other processed residues or material from canneries, wineries or other industrial sources.

Branches and Stumps means trees, stumps, branches, or other wood greater than 1 inch in diameter generated from landscapes, clearing land for commercial or residential development, road construction, agricultural land clearing, storms, or natural disaster.

Prunings, Trimings, Leaves and Grass means plant material, except woody material 1 inch or less in diameter from any public or private landscapes. Examples include branches, prunings, shrubs, leaves, grass clippings, and plants. This subtype does not include woody material greater than 4 inches in diameter.

Manures means manure and soiled bedding materials from domestic, farm, wild, or ranch animals. Examples include manure and soiled bedding from animal production operations, racetracks, riding stables, animal hospitals, laboratories, zoos, nature centers, and other sources.

Remainder/Composite Organic means organic material that cannot be put in any other type or subtype. This type includes items made mostly of organic materials but combined with other materials. Examples include cork, hemp rope, hair, cigarette butts, full vacuum bags, sawdust, and animal feces.

Construction and Demolition (in the MSW stream)

Asphalt Pavement, Brick, and Concrete includes asphalt pavement, brick, and concrete from construction activities and demolition of buildings, roads, and bridges and similar sources. Asphalt pavement also includes other black or brown, tar-like material mixed with aggregate and used as a paving material. Brick also includes masonry brick, landscaping or walkway brick. Concrete also includes pieces of building foundations, concrete paving, and cinder blocks.

Aggregates, Stone, Rock includes dirt, non-organic material from construction and landscaping activities. May also include products made predominately from these materials (i.e. granite counters).

Wood – Treated means wood that contains an adhesive, paint, stain, fire retardant, pesticide or preservative.

Wood – Untreated refers to any wood which does not contain an adhesive, paint, stain, fire retardant, pesticide or preservative; includes such items as pallets, skids, spools, packaging materials, bulky wood waste or scraps from newly built wood products. Does not including land clearing debris or yard waste prunings and trimmings

Asphalt Roofing means composite shingles and other roofing material made with asphalt. Examples include asphalt shingles and attached roofing tar and tar paper.

Drywall/Gypsum Board means interior wall covering made of a sheet of gypsum sandwiched between paper layers. Examples include used or unused, broken or whole sheets of sheetrock, drywall, gypsum board, plasterboard, gypsum board, gyproc, and wallboard.

Carpet and Carpet Padding means flooring applications consisting of various natural or synthetic fibers which maybe bonded to some type of backing material and plastic, foam, felt, or other material used under carpet to provide insulation and padding.

Remainder/Composite Construction and Demolition means construction and demolition material that cannot be put in any other type or subtype. This type may include items from different types combined, which would be very hard to separate.

Household Hazardous Waste

Ballasts, CFLs, and Other Fluorescents include ballasts, which are devices that electrically control fluorescent light fixtures and that include a capacitor, CFLs, which are compact fluorescent bulbs, and other fluorescent lighting, which includes tubular fluorescent lamps, neon lamps, black lights, and other lamps used for sanitation or cosmetic purposes.

Batteries – Lead Acid means lead acid storage batteries most commonly used in vehicles such as cars, trucks, boats, etc.

Batteries – Other means alkaline (including alkaline rechargeable) or household batteries such as AA, AAA, C, D, 4.5 volt, button cell, rechargeable and 9 volt used for flashlights, small appliances, and electronic devices.

Paint means containers with paint in them. Examples include latex paint, oil based paint, and tubes of pigment or fine art paint. This type does not include dried paint, empty paint cans, or empty aerosol containers.

Bio-Hazardous - means discarded animal or human medical/treatment wastes including needles, first aid wastes, diapers and other products which are used in relation to animal or human care. This category does not include cat litter or animal feces.

Vehicle and Equipment Fluids in containers and oil filters means containers with fluids used in vehicles or engines. Examples include antifreeze, oil, and brake fluid. This type does not include empty vehicle and equipment fluid containers. Oil filters include vehicle engine oil filters.

Empty Metal, Glass, and Plastic Containers (that originally contained toxic materials) means all containers that are empty but that at one time contained toxic or hazardous fluids or other materials. Examples include empty antifreeze, oil, or lye containers.

Other Hazardous or Household Hazardous Waste means all household or commercial products characterized as toxic, corrosive, flammable, ignitable, radioactive, poisonous, or reactive, including pesticides and fertilizers

Electronics

Computer-related Electronics includes computer CPUs, laptop computers, notebook computers, processors, printers, scanners, keyboards, etc. This category does not include automated typewriters or typesetters, portable handheld calculators, portable digital assistants or other similar devices.

Other “brown goods” includes cell phones, iPods, PDAs, small electronic appliances such as toasters, telephones, stereos, radios, clocks, hair dryers etc.

Televisions and Computer Monitors means a stand-alone display system containing a CRT or any other type of display primarily intended to receive video programming via broadcast. Examples also include non-CRT units such as plasma and LCD monitors.

Other Materials

Tires and other rubber means a continuous solid or pneumatic rubber covering intended for use on any type of vehicle (including bicycles), or trailer to be used in tandem with any type vehicle and other rubber products.

Textiles means natural or man-made textile materials such as cottons, wools, silk, nylon, polyester. Includes clothing, curtains, towels and other fabric materials.

Mattresses means mattresses and box springs.

Bulky Materials means products made from multiple materials and large in size, which are meant for extended use. Includes furniture (non-plastic), sinks, toilets, and other non-metal items

Restaurant Fats, Oils and Grease means any fats, oils and grease generated from the food preparation process.

Other Miscellaneous means any other type of waste not listed in any other sort category