

Cannabis Waste Stream Overview

Cultivation

Non-Hazardous

- Cannabis plant material from routine pruning, trimming, harvest, cloning, propagation
 - flower, leaf, stalk, root ball, discarded plants
- Wastewater from irrigation, fertigation, filtration with cannabis residuals
- Grow medium (soil, rock wool, coco fiber, etc.) with cannabis plant residuals (flower, leaf, stalk, root ball, etc.)

Hazardous

- Discarded process liquids (pesticides, fertilizers, pH adjusters, sanitizers, etc.).
- Spent lighting/indoor grow lamps/bulbs (HID, HPS, MH, fluorescent, etc.) with ballasts.

Types of Manufacture Waste

Non-Hazardous

- Post-extraction cannabis biomass (flower, leaf, trim, shake, etc.) with permissible levels of residual contaminants.
- Disposable items (gloves, PPE, filters, wipes, containers, utensils, etc.) with cannabis residuals.
- Discarded or wasted product and/or bulk infused ingredients that have either failed visual quality control (QC) or were contaminated in the 'kitchen'; scraps or cutouts from manufacturing or from equipment cleanout.
- Defective, returned, expired, or non-compliant cannabis goods/product (flower, extract, concentrate, solid/liquid edible, tincture, topical, vaporizer, and other consumable items infused with cannabis).
- Used machine fluids from equipment cleanout (vacuum pump oil, heat transfer fluid, etc.).
- Defective, returned, expired, or non-compliant disposable cannabis vape pens with internal lithium-ion batteries.

Hazardous

- Post-extraction cannabis biomass (flower, leaf, trim, shake, etc.) with solvent residuals.
- Post-refinement semi-aqueous byproduct (fat, wax, lipid, terpene, distillate, raffinate, etc.) with solvent residuals.
- Disposable items (gloves, PPE, filters, wipes, containers, utensils, etc.) with cannabis and/or solvent residuals.
- Used process liquids (organic solvents, chemical reactants, etc.) with trace cannabinoids.

Types of Distribution Waste

Non-Hazardous

- Defective, returned, expired, or non-compliant cannabis goods/product (flower, extract, concentrate, solid/liquid edible, tincture, topical, vaporizer, and other consumable items infused with cannabis).

Hazardous

- Defective, returned, expired, or non-compliant disposable cannabis vape pens with internal lithium-ion batteries.

Types of Retail Waste

Non-Hazardous

- Defective, returned, expired, or non-compliant cannabis goods/product (flower, extract, concentrate, solid/liquid edible, tincture, topical, vaporizer, and other consumable items infused with cannabis).
- Retired cannabis good/product shelf displays.

Hazardous

- Defective, returned, expired, or non-compliant disposable cannabis vape pens with internal lithium-ion batteries.

Types of Laboratory Testing Waste

Non-Hazardous

- Unused cannabis goods/product sample or specimen remaining after testing.
- Disposable items (gloves, PPE, filters, wipes, containers, utensils, etc.) with cannabis residuals.
- Used machine fluids from equipment cleanout (vacuum pump oil, heat transfer fluid, etc.).
- Biotechnology waste containing pathogens and cannabis goods/product.
- Defective, returned, expired, or non-compliant disposable cannabis vape pens with internal lithium-ion batteries.

Hazardous

- Disposable items (gloves, PPE, filters, wipes, containers, utensils, etc.) with cannabis and/or chemical residuals.
- Used process liquids (organic solvents, chemical reactants, corrosives, etc.) with cannabis residuals.

(source material from gaiaca.com)

Cannabis Waste Regulations

Standard Practice

- Rely on Local, State, and Federal Waste Disposal Guidelines
- Specific Regulations on THC containing material

- Require Waste Management Plans
- Packaging and Labeling Requirements generate more waste
- Regulations on Storage, Documentation, and Recordkeeping

Regulatory Issues to Consider

- Consider differences between THC-A and THC (activated) material in regard to child-resistant packaging
- Encourage Composting without having to render unusable and unrecognizable
- Allow for consumer package waste collection
- Incentives for using reusable, recyclable materials
- Ability to sell, transfer fibrous materials
- Encourage specific materials that can be recycled within VT
- Guidance on minimum size that can be recycled
- Avoid Exit Packaging Requirements
- Encourage landfill diversion schemes
- Enable consumer packaging take back schemes and incentive programs

California	Cannabis waste is organic waste
	Render unusable and unrecognizable: Manufacturers, Testing Labs, Retail Exempt: Cultivators, processors, nurseries
	Generate two or more cubic yards of solid waste must recycle its organic waste
Colorado	Cannabis waste mixed 50/50, New regs allow for unmixed disposal via composting or anaerobic digestion
Maine	Allows exemption of 50/50 requirement for root balls, soil media, stalks, leaves/branches
Massachusetts	Requires two agents of business witness and document waste handling Requires composting if generation >1 ton per week
Oregon	Requires cannabis waste be held for 3 days under surveillance Allows a licensee to give or sell marijuana waste to a producer, processor or wholesaler or research certificate holder

Examples of Regulations

MAINE

Section 9 - Waste Management

All wastes must be managed in accordance with federal, state and local requirements. Applicants should contact the Department of Environmental Protection for guidance on applicable regulations.

9.1 - Hazardous Waste

Discharges of hazardous waste or other matter in any quantity and under any circumstances must be reported to the Department and in accordance with this Section.

A. Licensees must immediately report discharges to the Department of Public Safety (State Police) unless exempted pursuant to Chapters 800 and 850 of the Department of Environmental Protection's regulations: (1) Licensees must call 1-800-452-4664 or 207-624-7000 to notify the Department of Public Safety of a discharge. (2) Licensees are not required to notify the Department of Environmental Protection. B. Licensees must also report any discharges of hazardous matter exceeding the federal reportable quantities in Appendix A to Chapters 800 and 850 of the Department of Environmental Protection's regulations as follows: (1) The licensee must call the National Response Center at 1-800-424-8802; and (2) If the spill goes beyond the boundary of the facility, the licensee must call the local fire department and the local community emergency coordinator.

9.2 - Marijuana Waste

In addition to any other provisions of 28-B MRS, this Rule or other applicable laws or rules, non-hazardous marijuana wastes shall be managed in accordance with the following:

A. A marijuana plant, marijuana, trim and other plant material in itself is not considered hazardous waste unless it is toxic, flammable or a listed waste subject to regulation under Department of Environmental Protection Rule Chapter 850.

B. Non-hazardous marijuana waste that is to be disposed of must be rendered unusable prior to leaving a marijuana establishment by one of the following methods: (1) Grinding and incorporating the marijuana waste with other ground materials so the resulting mixture is at least fifty percent non-marijuana waste by volume, including: (a) Food waste; (b) Yard waste; or (c) Other wastes approved by the Department; or (2) Using another method approved by the Department and recorded in the licensee's operating plan of record before implementation. (3) Sample collector licensees may not dispose of marijuana waste. A sample collector licensee who is in possession of samples of marijuana or marijuana products to be wasted must return such samples of marijuana, marijuana concentrate or marijuana products to the licensee from which the samples were collected. Page 81

C. Composting of marijuana wastes may be subject to the Department of Environmental Protection's Solid Waste Management Rules: Composting Facilities rule, 06-096 C.M.R., chapter 410.

9.2.1 Marijuana Waste Exceptions.

The following materials shall not be considered to be marijuana waste requiring treatment to be rendered unusable, provided that they are completely free of all marijuana flowers and leaves

with any visible trichomes, and may be disposed of, provided that they are non-hazardous, in accordance with standard waste disposal regulations:

- A. Root balls, soil or growing media;
- B. Stalks of marijuana plants; and
- C. Leaves and branches removed from marijuana clones, seedlings and marijuana plants

COLORADO

Cannabis Waste Management

A. All Applicable Laws Apply. Regulated Marijuana waste must be stored, secured, locked, and managed in accordance with all applicable federal, state, and local statutes, regulations, ordinances, or other requirements, including but not limited to the "Regulations Pertaining to Solid Waste Sites and Facilities" (6 CCR 1007-2, Part 1) established by the Colorado Department of Public Health and Environment pursuant to the "Solid Wastes Disposal Sites and Facilities Act", Title 30, Article 20, Part 1, C.R.S. and "Regulation No. 100 - Water and Wastewater Facility Operations Certification Requirements" (5 CCR 1003-2) established by the Colorado Department of Public Health and Environment pursuant to the Title 25, Article 9, Part 1, C.R.S.

B. Liquid Waste. Liquid waste from Regulated Marijuana Businesses shall be disposed of in compliance with all applicable federal, state and local laws, regulations, rules, and other requirements.

C. Chemical, Dangerous and Hazardous Waste. Disposal of chemical, dangerous, and hazardous waste must be conducted in a manner consistent with federal, state and local laws, statutes, regulations, rules, and other requirements. This may include, but is not limited to, the disposal of all Pesticide and other agricultural chemicals, certain solvents and other chemicals used in the production of Regulated Marijuana Concentrate and any Regulated Marijuana soaked in a Flammable Solvent for purposes of producing a Regulated Marijuana Concentrate.

D. Regulated Marijuana Waste Must Be Made Unusable and Unrecognizable. Unless expressly exempt by these rules, all Regulated Marijuana waste must be made unusable and Unrecognizable prior to leaving the Licensed Premises.

E. Methods to Make Waste Unusable and Unrecognizable. Regulated Marijuana waste shall be rendered unusable and Unrecognizable through one of the following methods:

1. Grind or Compact and Mix with Non-Marijuana Waste. A Regulated Marijuana Business may render its Regulated Marijuana waste unusable and Unrecognizable by grinding or compacting and incorporating the marijuana waste with non-consumable, solid wastes listed below such that the resulting mixture is at least 50 percent non-marijuana waste, and such that the resulting mixture cannot easily be separated and sorted:

- a. Paper waste;
- b. Plastic waste;
- c. Cardboard waste;
- d. Food waste;
- e. Grease or other compostable oil waste;
- f. Bokashi or other compost activators;
- g. Soil;

- h.** Sawdust;
- i.** Manure; and
- j.** Other wastes approved by the Division that will render the Regulated Marijuana waste unusable and Unrecognizable.

2. Other Permitted and Sustainable Methods for Rendering Regulated Marijuana Waste Unusable and Unrecognizable. A Regulated Marijuana Business may render its Regulated Marijuana waste unusable and Unrecognizable through the following methods and subject to the following requirements and restrictions:

a. The following methods are exempt from the 50/50 waste mixing requirement in subparagraph E(1) above and can be used to render Regulated Marijuana unusable and Unrecognizable:

- i.** On-site composting;
- ii.** Anaerobic digestion;
- iii.** Pyrolyze into biochar; or
- iv.** Biomass gasification.

b. Requirements for Other Permitted and Sustainable Methods to Render Regulated Marijuana Waste Unusable and Unrecognizable. A Regulated Marijuana Business using other methods of rendering Regulated Marijuana waste unusable and Unrecognizable must comply with the requirements of this rule.

i. A Regulated Marijuana Business may utilize on its own Licensed Premises or may Transfer Regulated Marijuana waste to another Regulated Marijuana Business for on-site composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification.

ii. A Regulated Marijuana Business may transfer only the stalks, stems, fan leaves, and roots from Regulated Marijuana to an area outside the Licensed Premises that is under the Licensee's possession and control or to an unlicensed third-party that is registered and in good standing with the Colorado Secretary of State for composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification.

iii. Regulated Marijuana waste that is transferred to a location under the Licensee's possession and control, to another Regulated Marijuana Business, or to a third-party pursuant to this rule is not required to comply with the 3-800 Series Rules - Inventory Tracking or the 3-1000 Series Rules - Labeling, Packaging, and Product Safety but must be recorded on the Transferring Regulated Marijuana Business' waste log.

iv. A Regulated Marijuana Business or an unlicensed third-party providing composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification shall ensure that the organic composition of the Regulated Marijuana waste is permanently altered so that it is rendered unusable and Unrecognizable.

v. Waste Management Plan. A Regulated Marijuana Business using on-site composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification to render Regulated Marijuana waste unusable and Unrecognizable must establish and maintain on its Licensed Premises a waste management plan that includes at least the following information: A description of the Regulated Marijuana Business's methods for on-site composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification and identification of the areas that will be used for these activities. The location of these activities may include areas used for other

operational activities of the Regulated Marijuana Business or may be areas outside the Licensed Premises so long as such areas are within the Licensee's possession and control.

vi. Written Contract for Transfers to Unlicensed Third Parties. A Regulated Marijuana Business that is transferring stalks, stems, fan leaves, or roots from Regulated Marijuana to an unlicensed third-party for composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification must have a written contract with that third-party. The Regulated Marijuana Business must maintain on its Licensed Premises a copy of the written contract and copies of receipts and invoices related to such third-party services. The written contract with the third-party must document at least the following information:

A. The identity of the unlicensed third party receiving any transfer of Regulated Marijuana waste pursuant to this Rule;

B. A description of the services provided by the unlicensed third party and the agreed-upon methods for managing the Regulated Marijuana waste, including the end-use of such waste; and

C. A requirement that the third-party is registered with the Colorado Secretary of State and must remain in in good standing during the contract term.

F. Mobile Waste Rendering. A Licensee or a third party vendor may also render Regulated Marijuana waste unusable and Unrecognizable outside of the Licensed Premises, subject to the following requirements and restrictions:

1. The waste must be rendered unusable and Unrecognizable in accordance with subparagraph (E) of this Rule, and unless otherwise expressly exempt by this Rule 3-230, mobile waste rendering must occur on property under the control of the Licensee that is immediately adjacent to the Licensed Premises;

2. Unless otherwise expressly exempt by this Rule 3-230, the waste must be taken from the Licensed Premises by an Owner Licensee or Employee Licensee directly to the vehicle where the rendering will occur;

3. Unless otherwise expressly exempt by this Rule 3-230, an Owner Licensee or Employee Licensee must monitor and observe the rendering to ensure the waste is made unusable and Unrecognizable;

4. Unless otherwise expressly exempt by this Rule 3-230, the Licensee shall ensure the rendering of any Regulated Marijuana waste unusable and Unrecognizable by a third party is recorded on the Licensee's video surveillance system; and

5. Any other restrictions imposed by the Local Licensing Authority or Local Jurisdiction.

G. After Waste is Made Unusable and Unrecognizable. After Regulated Marijuana waste is made unusable and Unrecognizable, the rendered waste shall be disposed of or otherwise managed as follows:

1. Disposed of at a solid waste site and disposal facility that has a Certificate of Designation from the local governing authority; or

2. Deposited at a compost facility that is permitted or approved by the Colorado Department of Public Health and Environment; or

3. Regulated Marijuana waste that has been rendered unusable and Unrecognizable by composting, anaerobic digestion, pyrolyzing into biochar or biomass gasification and pursuant to the Licensee's waste management plan(s) may be transferred to a Regulated Marijuana Business or an unlicensed third-party for further processing or use.

4. A Regulated Marijuana Business with cultivation privileges may reintroduce its own or Regulated Marijuana waste obtained from another Regulated Marijuana Business that has been rendered unusable and Unrecognizable into its Regulated Marijuana cultivation operations subject to its standard operating procedures. For example, a Medical Marijuana Cultivation Facility or Retail Marijuana Cultivation Facility may use such waste as a soil amendment, potting media, or fertilizer

H. Proper Disposal of Waste. A Licensee shall only dispose of Regulated Marijuana waste in a secured waste receptacle in possession and control of the Licensee.

I. Inventory Tracking Requirements.

1. In addition to all other tracking requirements set forth in these rules, a Licensee shall utilize the Inventory Tracking System to ensure its post-harvest waste and Fibrous Waste materials are identified, weighed, and tracked while on the Licensed Premises until disposed of.

2. All Regulated Marijuana waste must be weighed before leaving any Regulated Marijuana Business. A scale used to weigh Regulated Marijuana waste prior to entry into the Inventory Tracking System shall be tested and approved in accordance with section 35-14-127, C.R.S. See Rule 3-805 - Regulated Marijuana Businesses: Inventory Tracking System.

3. A Licensee is required to maintain accurate and comprehensive records regarding Regulated Marijuana waste that accounts for, reconciles, and evidences all waste activity related to the disposal of Regulated Marijuana. See Rule 3-905 - Business Records Required.

4. A Licensee is required to maintain accurate and comprehensive records regarding any waste material produced through the trimming or pruning of a Regulated Marijuana plant prior to harvest, which must include weighing and documenting all waste, including Fibrous Waste. Unless required by an Inventory Tracking System procedure, records of waste produced prior to harvest must be maintained on the Licensed Premises. Waste, excluding Fibrous Waste and Marijuana Consumer Waste, whether produced prior or subsequent to harvest, must be disposed of in accordance with this Rule and be made unusable and Unrecognizable. See Rule 3-235 - Transfers of Fibrous Waste and Rule 3-240 - Collection of Marijuana Consumer Waste.

Collection of Marijuana Consumer Waste

A. All Applicable Laws Apply. Marijuana Consumer Waste must be stored and managed in accordance with all applicable state and local statutes, regulations, ordinances, or other requirements, including but not limited to the "Regulations Pertaining to Solid Waste Sites and Facilities" (6 CCR 1007-2, Part 1) established by the Colorado Department of Public Health and Environment pursuant to the "Solid Wastes Disposal Sites and Facilities Act", Title 30, Article 20, Part 1, C.R.S. and "Regulation No. 100 - Water and Wastewater Facility Operations Certification Requirements" (5 CCR 1003-2) established by the Colorado Department of Public Health and Environment pursuant to the Title 25, Article 9, Part 1, C.R.S.

B. Regulated Marijuana Businesses may collect, reuse, and recycle Marijuana Consumer Waste in accordance with the requirements of this Rule 3-240.

C. Collection, Separation, and Processes.

1. Collection. A Licensee must comply with the following requirements when collecting Marijuana Consumer Waste pursuant to this Rule:

- a.** Only Medical Marijuana Stores, Retail Marijuana Stores, and Licensed Hospitality Businesses may collect Marijuana Consumer Waste from patients and consumers. Medical Marijuana Stores, Retail Marijuana Stores, and Licensed Hospitality Businesses collecting Marijuana Consumer Waste pursuant to this Rule are not limited to collecting Marijuana Consumer Waste from patients or consumers who purchased Regulated Marijuana from the Medical Marijuana Store, Retail Marijuana Store, or Licensed Hospitality Business.
- b.** A Regulated Marijuana Business may collect Marijuana Consumer Waste from any of its Owner Licensees or Employee Licensees who purchased the Regulated Marijuana from the Regulated Marijuana Business, or may collect Marijuana Consumer Waste from other Regulated Marijuana Businesses pursuant to paragraph (E) of this Rule.
- c.** The Licensee must utilize receptacles that are locked, sealed and designed to require a key or specialized tools in order to open and access the contents of the receptacle used for collection of Marijuana Consumer Waste;
- d.** All receptacles used for collection of Marijuana Consumer Waste shall be located in a secured area on the Licensed Premises and shall be reasonably supervised by a Licensee to ensure any Marijuana Consumer Waste collected is only removed by a Licensee;
- e.** All receptacles used for collection of Marijuana Consumer Waste shall be recorded on video surveillance; and
- f.** All receptacles used for collection of Marijuana Consumer Waste shall be labeled. The label must at least identify the receptacle as "Contains Marijuana Consumer Waste." A Licensee may choose to include additional information on the receptacle label.

2. Separation. Regulated Marijuana Businesses collecting Marijuana Consumer Waste pursuant to this Rule must separate any electronic and battery components from the Marijuana Consumer Waste.

3. Processes. Regulated Marijuana Businesses collecting Marijuana Consumer Waste pursuant to this Rule must establish standard operating procedures that ensure at a minimum any remaining Regulated Marijuana in Marijuana Consumer Waste is removed and destroyed to the extent practicable.

D. Reuse of Marijuana Consumer Waste. Once any remaining Regulated Marijuana has been removed and destroyed pursuant to these rules, a Regulated Marijuana Business may reuse Marijuana Consumer Waste as follows and subject to the following requirements and restrictions:

1. Sanitizing. The Containers have been sanitized and disinfected either by a Regulated Marijuana Business or by a third-party to ensure that they do not contain any harmful residue or contaminants.

2. Child-Resistant Containers. Either the Containers can be reused with new child resistant packaging that complies with 16 C.F.R. 1700.15 (1995) and 16 C.F.R. 1700.20 (1995); or if new child resistant packaging is not being used, based on a visual inspection, the existing Child-Resistant packaging appears to be in good working order and does not appear to pose a risk of unintended exposure or ingestion of Regulated Marijuana. The visual inspection must ensure such Containers are not brittle or have chips, cracks, or other imperfections that could compromise the child-resistant properties of the Container or otherwise pose a threat of harm to a patient or consumer.

E. Transfers of Marijuana Consumer Waste. Once any remaining Regulated Marijuana has been removed and destroyed pursuant to these rules, a Regulated Marijuana Business may transfer Marijuana Consumer Waste as follows:

- 1.** A Licensee may Transfer Marijuana Consumer Waste to another Regulated Marijuana Business for purposes of further processing and recycling or for reuse pursuant to this Rule; or
- 2.** A Licensee may transfer Marijuana Consumer Waste, excluding the electronic components and battery components, to a Person for purposes of recycling or for reuse pursuant to this Rule. To the extent required, such Person shall be registered as required by the Colorado Department of Public Health and Environment's regulations at 6 CCR 1007-2, Part 1, Section 8; or
- 3.** A Licensee may transfer the electronic and battery components of Marijuana Consumer Waste to a Person for purposes of recycling in accordance with the Colorado Department of Public Health and Environment's regulations at 6 CCR 1007-3.

F. Business Records. Regulated Marijuana Businesses that collect and Transfer Marijuana Consumer Waste pursuant to this Rule 3-240 shall keep all contracts, standard operating procedures, and receipts relating to the collection and Transfer of any Marijuana Consumer Waste in accordance with Rule 3-905, including but not limited to Rule 3-905(A)(2).

G. Violation Affecting Public Safety. It may be considered a violation affecting public safety for a Licensee to Transfer Marijuana Consumer Waste that has remaining Regulated Marijuana and in a manner other than in accordance with this Rule 3-240.

(IV) CONDITIONS UNDER WHICH A LICENSEE IS AUTHORIZED TO TRANSFER FIBROUS WASTE TO A PERSON FOR THE PURPOSE OF PRODUCING ONLY INDUSTRIAL FIBER PRODUCTS. THE CONDITIONS MUST INCLUDE CONTRACT REQUIREMENTS THAT STIPULATE THAT THE FIBROUS WASTE WILL ONLY BE USED TO PRODUCE INDUSTRIAL FIBER PRODUCTS; RECORD-KEEPING REQUIREMENTS; SECURITY MEASURES RELATED TO THE TRANSPORT AND TRANSFER OF FIBROUS WASTE; HANDLING CONTAMINATED FIBROUS WASTE REQUIREMENTS; AND PROCESSES ASSOCIATED WITH HANDLING FIBROUS WASTE. THE RULES SHALL NOT REQUIRE LICENSEES TO ALTER FIBROUS WASTE FROM ITS NATURAL STATE PRIOR TO TRANSFER.

New Sustainability Measures 2021:

- New sustainable options for licensees to make marijuana plant waste unusable and unrecognizable;
- New sustainable methods available to licensees exempt from the 50% Mixture Requirement, including:
 - On-Site Composting
 - Anaerobic Digestion
 - Pyrolyze into Biochar
 - Biomass Gasification
- Additional options for consumer waste recycling, including:

- Consumers can recycle their marijuana waste at Regulated Marijuana Stores and Hospitality Businesses
- Other Regulated Marijuana Businesses can recycle their waste at another Regulated Marijuana Businesses