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BOULDER COUNTY, CO

Phase 1: Compost Facility Feasibility Study

Compost Facility Feasibility Study

Project No. 176638
Revision 1
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Contents

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List of Abbreviations

Abbreviation	Term/Phrase/Name
A1	A1 Organics
AD	Anaerobic digestion
ASP	Aerated Static Pile
BPI	Biodegradable Products Institute
C&D	Construction and demolition
C3	Colorado Circular Communities
CDPHE	Colorado Department of Public Health and Environment
CFWR	Composting and Food Waste Reduction
County	Boulder County, Colorado
DADs	Denver Arapaho Disposal Site
DOT	Department of Transportation
EPA	Environmental Protection Agency
EPR	Extended Producer Responsibility
ICI	Industrial, Commercial, and Institutional
MASP	Modified Static Aerobic Piles
MSW	Municipal Solid Waste
NRCS	Natural Resources Conservation Service
OCC	Old corrugated containers
OUAIP	Office of Urban Agriculture and Innovative Production
P3	Public-private partnership
PBC	Public Benefit Corporation
PET	Polyethylene terephthalate
PFAS	Per- and polyfluoroalkyl substances
PLA	Polylactic Acid
Study	Phase 1: Compost Facility Feasibility Study
USDA	United States Department of Agriculture
Western Disposal	Western Disposal Services
WM	Waste Management

Executive Summary

Boulder County, Colorado (County) is committed to achieving its zero-waste goal through actions like increasing organics diversion. As part of this effort, the County contracted with Burns & McDonnell Engineering Company, Inc. to conduct this Phase 1: Compost Facility Feasibility Study (Study) to understand organics processing infrastructure options, financial and operational models, and overall feasibility of a County organics management facility. The County's goal is to develop a sustainable organics management system capable of accepting food waste, yard waste, branches/limbs/stumps, and clean wood/pallets from residential and commercial sectors. Through this Study, a centralized compost facility utilizing aerated static pile technology emerged as an optimal alternative for the County's compost facility.

Phase 1 of this Study explored options for managing the County's organic waste, and the following are the key findings.

- The County currently relies on a mix of private and municipal haulers, drop-off centers, and limited processing facilities within the County. Most collected organics are transported to A1 Organics in Keenesburg, 45–60 miles away. The current system faces several challenges, including long transport distances, limited County control over what materials are accepted, and a lack of local large-scale composting options.
- In 2023, the County diverted about 41,500 tons of organic material, with 54% being yard and wood waste and 46% food waste. However, a 2019 study showed that 36% of landfilled waste was organic materials comprising approximately 80,000 tons, highlighting the opportunity for expanded composting services.
- The Study considered compostable products and their contamination risks if accepted in County feedstock. These items are often indistinguishable from non-compostable materials and may not fully break down during processing. As a result, they can lower the quality of the final compost and prevent it from being certified organic, reducing end market opportunities. Therefore, for this evaluation, it was assumed that compostable products would not be accepted at this facility initially, though the County could be poised to process them in the future as technology improves.
- The Study evaluated six composting infrastructure alternatives using a decision matrix with 19 criteria. These alternatives included centralized turned windrow composting, centralized aerated static pile (ASP) composting, decentralized composting, anaerobic digestion, biochar, and an organics transfer station. After initial screening, only two centralized composting options remained viable: turned windrow and ASP. The ASP method emerged as the most promising due to its smaller footprint, faster processing, and better odor control.
- The Study also explored public private partnership's (P3) as a way to share costs and responsibilities. Interviews with five haulers and processors showed strong interest in participating in a P3, provided the project is financially viable and includes shared responsibility for feedstock, costs, and marketing the final product. Additionally, several funding opportunities, both state and national, were identified that could support a County compost facility

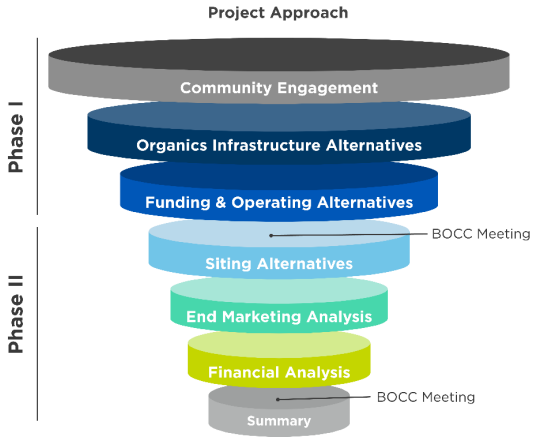
Phase 1 of this Study laid the groundwork for understanding the feasibility of a County compost facility. Phase 2 will continue this work and include sizing calculations and a siting study of a potential location, an evaluation of end markets, and the financial feasibility of potential funding and operating models with a centralized ASP composting facility.

1.0 Study Overview, Guiding Principles, and Definitions

Boulder County, Colorado (County) has a commitment to "Zero Waste or Darn Near," and other climate action goals. As part of this effort, the County contracted with Burns & McDonnell Engineering Company to conduct this Phase 1: Compost Facility Feasibility Study (Study) to understand organics[1] processing infrastructure options, financial and operational models, and overall feasibility of a County organics management facility. The County's goal is to develop an organics management system capable of accepting food waste, yard waste, branches/limbs/stumps, and clean wood/pallets from residential and commercial sections. Notably, sewage sludge (also called biosolids) and agricultural waste were excluded from this Study's analysis because they are handled through separate land application or composting processes outside the scope of a proposed County facility. The Study also evaluated the potential of accepting compostable products and paper products.

1.1 Study Overview

The Study includes two phases:



Phase 1 included an evaluation of Boulder County's current composting system and several infrastructure alternatives. The infrastructure alternatives were evaluated based on criteria and weight set forth by the County, and the output was a decision matrix. Phase 1 also included assessing potential facility funding and operating models of various combinations of public-private partnerships. Phase 1 concluded with a presentation to the public and two members of the Board of County Commissioners on February 25, 2025. The presentation summarized the Phase 1 activities and outlined the activities to be performed during Phase 2. A question-and-answer session was also held with those in attendance.

Phase 2 will include sizing calculations and a siting study of potential locations, an evaluation of end markets, and the financial feasibility of potential funding and operating models, such as a capital operational and revenue analysis. Phase 2 will conclude with another presentation to the Board of County Commissioners and additional community engagement events.

This report presents the results of Phase 1 of the Study. Once Phase 2 is completed, the results will be presented in a separate report.

1.2 Study Guiding Principles

The Study's guiding principles aligned with the existing County values as follows:

- Prioritize environmental ethics and racial equity

[1] See section 1.3 for definitions.

- Manage responsibility over County-generated organics
- Manage end products of soil amendments within the County for a closed loop
- Reduce hauling distances to improve sustainable management of organics

1.3 Definitions

The following definitions and key terms are used throughout the Study and are necessary for a comprehensive understanding of the current organics management systems and strategies that may be implemented in the future.

1.3.1 Materials

Several material categories are handled through various collection, disposal, and processing methods and facilities, depending on the category. This section provides definitions for the primary categories of materials addressed in this Study, consistent with the County's waste composition study from 2019.

- **Feedstock.** Organic materials that are the raw ingredients for composting include food waste, yard waste, brush, clean wood, compostable paper, compostable products, agricultural and industrial materials. Different feedstocks determine composting conditions and the quality of resulting compost. Often, multiple feedstocks are mixed together to create favorable composting conditions under specific proportions.
- **Municipal Solid Waste (MSW).** The entirety of the waste stream that is generated by everyday activities in the residential and commercial sectors. MSW can be further categorized by material types, including refuse, single-stream recyclables, organics, and household waste. Different MSW material types align with different best management practices. Refuse is disposed of in MSW landfills. Much of the MSW generated can be recycled or composted at various processing facilities. MSW does not include commercial hazardous waste or industrial, agricultural, mining, or sewage sludge waste projects.
- **Organics.** Plant or animal-based materials. Organics may have the potential to be diverted from landfill disposal through composting, mulching, anaerobic digestion (AD), and biochar processes. Within the category of organics, there are several sub-categories:
    - **Biodegradable Products Institute (BPI) Certified Compostables.** Containers, cutlery, and any other similar materials identified as BPI compostable certified, typically with the BPI certification logo or text, indicating that they can break down completely in a commercial compost setting.
    - **Branches, Limbs, Stumps.** Branches, limbs, and logs greater than 2 inches in diameter.
    - **Clean Wood.** Any wood, like dimensional lumber, that does not contain an adhesive, paint, stain, fire retardant, pesticide or preservative; it may contain metal items such as screws and nails.
    - **Compostable Paper.** Soiled and used fibers such as tissues and paper, including old corrugated containers (OCC) that are soiled with food like paper plates, paper cups, pizza boxes, popcorn bags and paper towels. Includes wax-coated OCC.
    - **Compostable Products.** Includes compostable paper (see definition) and BPI certified compostables (see definition).
    - **Food Waste.** Putrescible organic materials which are the by-products of activities connected with the growing, preparing, cooking, processing, or consuming of food by humans or pets.

  - **Marijuana Waste.** Marijuana clippings, plants, products, and paraphernalia typically associated with marijuana usage.
  - **Other Organics.** Organic material that doesn't fit into the categories specified above, and items that are primarily organic but include other materials like plastic or metal. Examples include cotton balls, hair, Q-tips, wax, soap, kitty litter, animal feces, and animal carcasses.
  - **Wood Pallets.** Wood pallets and crating materials commonly used for industrial and commercial packaging and shipping.
  - **Yard Waste.** Grass clippings, leaves, flowers, plant trimmings, and branches less than 2 inches in diameter.
- **Single-stream Recyclables.** Materials that are typically accepted through municipal curbside recycling programs or drop-off locations, processed through a material recovery facility (MRF), and sold as commodities to markets, where the material is then repurposed. Single-stream recyclables include items such as, but are not limited to, plastic and glass containers, aluminum and steel cans, cardboard, and other various paper products. The full range of materials accepted through a municipality's single-stream recycling program can vary by community or by hauler.
- **Industrial Waste.** Material generated as byproducts of industrial or manufacturing processes. This waste type is typically uniform in its disposal, containing a single waste product and/or its packaging in a load for disposal.

1.3.2 Sectors

Material generation is broadly categorized into two primary sectors: residential (single-family and multifamily) and commercial. Construction and demolition (C&D) debris is not considered MSW and is handled separately from residential and commercial MSW; however, in the State of Colorado, it is comingled when disposed of. For this report, sectors are defined as follows:

- **Single-Family Residential Sector.** A single-family dwelling is defined as a detached building that is occupied or which is arranged, designed, and intended to be occupied by not more than one household and which contains not more than one dwelling unit.
- **Multifamily Residential Sector.** Multifamily dwellings are defined as buildings that are occupied or are arranged, designed, and intended to be occupied by two or more households and contain more than one dwelling unit, but not including hotels, motels, or boarding houses.
- **Commercial Sector.** The commercial sector includes material generated by commercial (offices, retail and wholesale establishments, restaurants, etc.) and institutional facilities (schools, libraries, hospitals, etc.). This sector is also referred to as Industrial, Commercial, and Institutional (ICI) in the waste composition study report.

2.0 Current System

The County's current organics management system includes a network of private and municipal haulers, drop-off centers, transfer facilities, and processing facilities. The County does not haul or process residential or commercial organics but has a hauler licensing program that requires organics collection services in some parts of the County. Additionally, some local municipalities have universal waste and recycling ordinances requiring the collection of organics. The system faces challenges, including long haul distances, minimal County control over acceptable feedstock, and the lack of alternative large-scale composting facilities in the region. This section details organics regulations, existing infrastructure, and County generation and diversion of organic materials.

2.1 Organics Regulations

Boulder County Ordinance #2019-3 requires hauler licenses for all hauling companies operating within the County that collect, transport, or dispose of discarded materials. Hauler licenses must be renewed annually by the hauler, and as a provision of their license, they must report tonnage data. The ordinance requires that haulers who operate in specified unincorporated and urbanized areas indicated by various County-identified zones are to provide for the collection of yard waste and food waste. There are 76 licensed haulers within the County, but only a portion of those licensed haul organic waste.[2]

The State of Colorado passed the Compostables Labeling Act (Senate Bill 23-253) in 2023 to ensure that certified compostable products are clearly labeled and easily recognized to reduce the disposal of non-compostable plastic products in compost operations. To clearly indicate that a product can be composted, it must display the ASTM D6400 and D6868 compostable certification logo, be labeled "compostable," utilize green coloring or symbols, and not show any chasing arrow identification code/recycling symbols.[3]

2.2 Processing Facility Infrastructure

According to the Colorado Department of Public Health and Environment (CDPHE) website, there are two Class III regulated composting facilities within the Denver Metro area: A1 Organics (A1) and Waste Management (WM) Denver Arapaho Disposal Site (DADS).[4] Compost facility classes are structured around the type of feedstock accepted and the size of the facility. Class III facilities can accept any type of feedstock material, including food and yard waste, relevant to the County's commercial needs. Detailed information about each of the regional Class III compost facilities is in Table 2-1.

Organics collected in the County are primarily processed at A1 in Keenesburg, 45-60 miles from major County municipalities. A1 accepts food scraps, plants, and yard trimmings but does not accept compostable products. This recent change from April 2023 is an effort to reduce contamination in the compost and

[2] Boulder County. (2024). *Hauling Requirements for Haulers*. https://bouldercounty.gov/environment/trash/hauler-license/
[3] CDPHE. (2024). *The Compostables Labeling Act Frequently Asked Questions*. https://cdphe.colorado.gov/hm/compostable-product-labeling-act-faq
[4] CDPHE. (2025, May 20). *HMWMD - CDPHE Colorado Commercial Composting map*. https://www.arcgis.com/apps/mapviewer/index.html?webmap=a0a1e93105c94585b79bf790bc7dfa24&extent=-109.1692,36.9745,-101.0558,40.533v

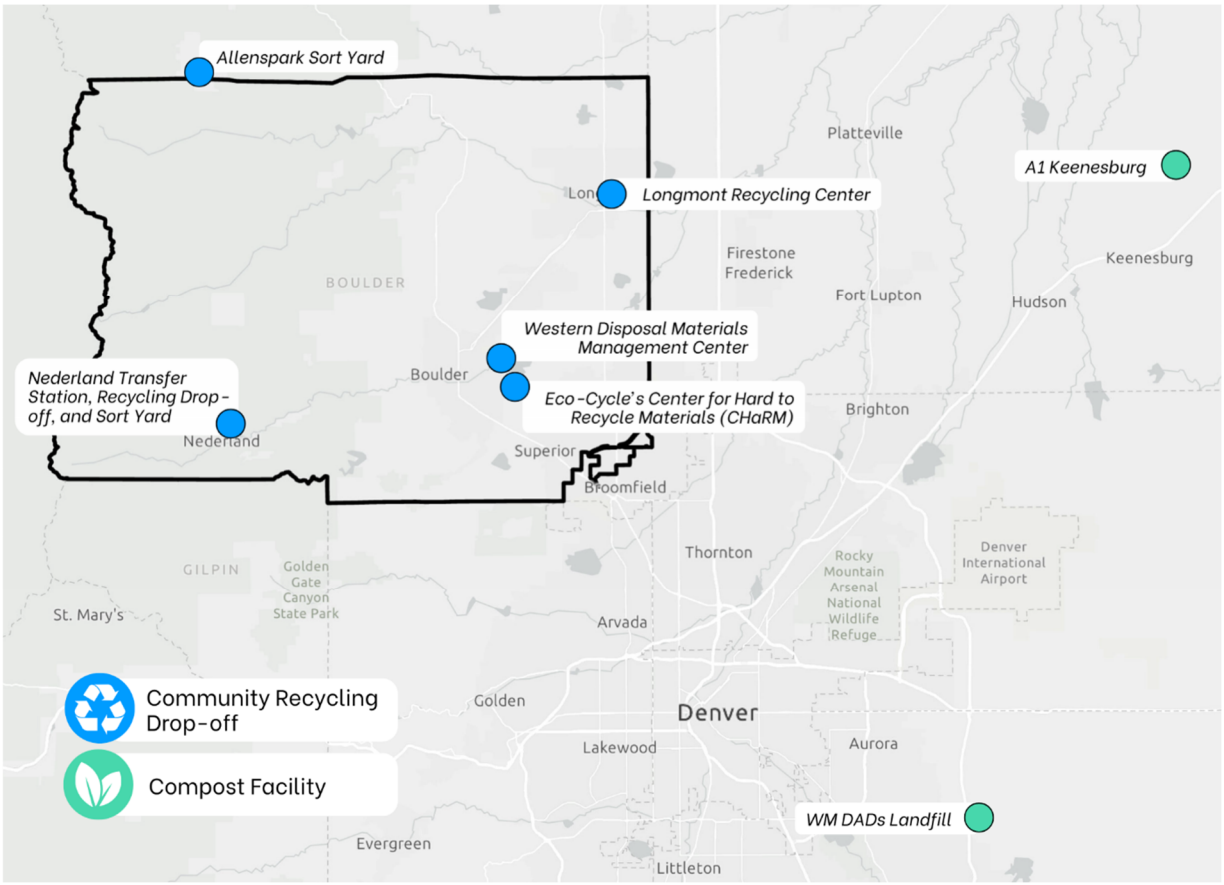
improve A1's ability to sell its product.[5] Within the County, Western Disposal Services (Western Disposal) privately operates an organics transfer station. Their facility includes a commercial depackager for pre-processing food waste before transferring to A1. Western Disposal also manages yard and wood waste through its materials management center.[6]

2.3 Drop-Off Centers

To support the County's composting goals, a network of six drop-off centers is in place. They can be found in Allenspark, Longmont, Nederland, and Boulder. These drop-off centers primarily accept yard waste, with food waste accepted at select locations. Residents are billed by volume, and some centers offer free material giveaways. Detailed information about each of the drop-off locations is presented in Table 2-2.

The proximity of the drop-off centers to other surrounding compost facilities within the County boundaries (in red) is shown in Figure 2-1.

Figure 2-1:Drop Off, Sort Yards, and Surrounding Compost Facilities Map



[5] Boulder County. (2023). *Composting Changes FAQS*. https://bouldercounty.gov/environment/composting/composting-changes-faqs/
[6] Western Disposal. (2025). *About Western*. https://www.westerndisposal.com/about-western/

2.4 Collection System

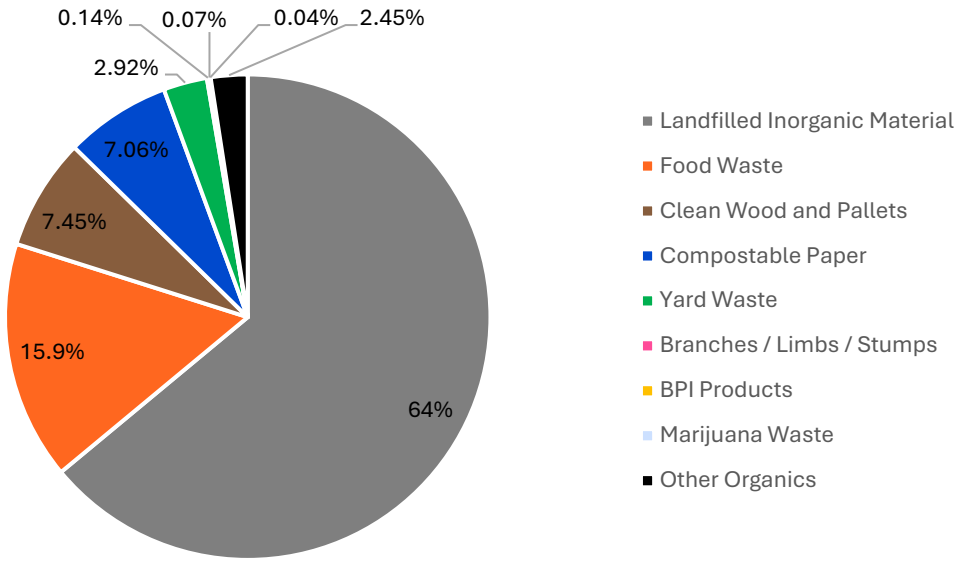
Organic waste is collected by a network of private and municipal haulers. Commercial organics collection is serviced by private haulers on the open market as an optional service in some areas. The residential curbside organics collection system varies throughout the cities and unincorporated areas of the County. Service is either provided through an open-market system, where residents contract directly with a hauler, or provided by the City through a single hauler. Organics collection is either offered as an optional opt-in service for an additional fee or provided as a universal service as part of the base fee. Detailed information about County municipal organics collection systems is provided in Table 2-3.

2.5 Organic Material Characteristics, Generation, and Diversion

According to the County's hauler-reported diversion data on organics, 41,500 tons of organics were diverted in 2023.[7] County haulers reported 54% of their organic diversion as yard and wood waste recycling and the remaining 46% as food waste. The County's organics diversion program generators are mostly commercial sources (47.8%), with single-family (36.0%) and multifamily (16.2%) residences contributing the rest.

A County-wide waste characterization study was conducted by MSW Consultants in 2019 and found that 36%, or 83,719 tons, of all landfilled waste was characterized as organic, prompting the opportunity for an expanded organics collection system.[8] The majority of landfilled organics was food waste, followed by clean wood and pallets, compostable paper, and yard waste, as seen in Figure 2-2. Notably, BPI-certified compostable materials accounted for less than one-tenth of a percent of landfilled waste.

Figure 2-2: Landfilled Organics, 2019



[7] ReTrack. (2023). *A2_County _Hauling_Data*
[8] MSW Consultants. (2019, November). *Countywide Waste Composition Study*. https://assets.bouldercounty.gov/wp-content/uploads/2020/04/boulder-county-final-waste-composition-study-2019.pdf

3.0 Compostable Products Analysis

The management of compostable products - products designed to break down under controlled composting conditions - at a composting facility is a complex issue. While such products aim to reduce single-use plastics and facilitate food scrap collection, they present significant operational and market challenges.

3.1 Compostable Product Challenges

Compostable products (mostly food service ware and food-related packaging) are envisioned to help reduce the use of single-use plastics, facilitate food scraps recovery, and reduce contamination at compost facilities, but have so far failed to deliver on those promises. Compostable products are typically derived from biological origins but may also contain some petroleum content. The term comprises several chemistries and can broadly be divided into plastic and fiber, but there are numerous hybrids and resins under the broad category of "compostable products."

To some extent, compostable products strive to replace single-use packaging on a one-to-one basis. This has proved troublesome since a clear to-go cup made of compostable Polylactic Acid (PLA) looks comparable to a clear non-compostable polyethylene terephthalate (PET) cup. Identification by the consumer is one of the most significant challenges of implementing and recovering compostable products, since consumers need to be able to determine which bin to put the compostable item in.

Compostable plastics (somewhat distinct from fiber products) make up less than 0.5% of the global plastics market. Compostable plastics are commonly made from by-products of abundant starch sources (e.g., corn, sugar cane, microorganisms, petroleum or a combination of all of these). While the production of these products is predicted to increase dramatically, there is no such growth predicted in the number of facilities and infrastructure required to successfully collect and compost these materials. There are fewer than 200 composting facilities in the US capable of handling food scraps, and maybe fewer than half of those are willing to accept these products.[9] While the number of households with access to food waste collection is increasing, it is unclear how or if compostable plastics have a role in facilitating these collection programs. Most compostable plastics in use today end up in landfills. Consumers are confused as to how to sort them, few programs exist to compost them, and many large composters are installing depackaging equipment to try to manage the overwhelming traditional plastic in the organic stream. This equipment is inadvertently separating compostable plastics as well as conventional plastics since depackagers cannot distinguish by resin type.

Throughout various stages of the composting process, compostable products pose a threat to clean end products. Compostable products are often indistinguishable from non-compostable single-use products such as utensils, tableware, and takeout packaging. Thus, non-compostable products contaminate the incoming feedstock since consumers may unassumingly dispose of non-compostable products in their compost, and pre-processing machinery cannot distinguish between them. Pre-processing machinery is not selective; therefore, both non-compostable contamination and compostable products are likely to be landfilled. Additionally, while compostable products are designed to completely biodegrade, they rarely

[9] BioCycle. (2023, July 25). *BioCycle Nationwide Survey: Full-Scale Food Waste Composting Infrastructure In The U.S.* https://www.biocycle.net/us-food-waste-composting-infrastructure/

break down completely during the active processing stage of composting.[10] Consequently, residual fragments remain in the finished product that post-process screening doesn't always remove. With fragments remaining, end market opportunities decrease since the end product cannot be certified as organic with contamination.[11] By accepting feedstocks with compostable products, the finished product may even contain per- and polyfluoroalkyl substances (PFAS), contaminating the end product and minimizing market value.[12] The composting process and its contamination challenges are summarized in Table 3-1.

3.2 Scenarios Analysis

This Study analyzed four operational scenarios to evaluate how compostable products could be managed at a potential facility. Pre-processing, refers to a hypothetical County compost facility having a depackager to remove compostable products from the waste stream. To assess the practical implications, scenarios were evaluated in Table 3-2.

In the first three scenarios, the end product is contaminated with compostable products. Therefore, for the matrix evaluation, it was assumed that compostable products **would not be accepted** at this facility initially, though the County could be poised to process them in the future as technology improves.

[10] BioCycle. (2024, November 19). *Compostable Product Field Testing Public Dataset*. https://www.biocycle.net/compostable-product-field-testing-public-dataset/
[11] BioCycle. (2021, September 14). *Compost Manufacturers' Decision-Making Guide to Compostable Products Acceptance*. https://www.biocycle.net/compost-manufacturers-decision-making-guide-to-compostable-products-acceptance/
[12] Schwartz-Narbonne, et. al., (2023, March 28) *Per- and Polyfluoroalkyl Substances in Canadian Fast Food Packaging*. https://pubs.acs.org/doi/10.1021/acs.estlett.2c00926

4.0 Evaluation of Alternatives - Decision Matrix

The following organic processing infrastructure alternatives were evaluated in comparison to the County's current processing services agreement, and a decision matrix was developed.

- Centralized Turned Windrow Composting Facility
- Centralized Aerated Static Pile (ASP) Composting Facility
- Decentralized Composting Facilities
- Anaerobic Digestion (AD) Facility
- Biochar Facility
- Organics Transfer Station Facility

The County's desired feedstocks are food waste, yard waste, branches/limbs/stumps, and clean wood/pallets. Notably, biosolids were excluded from this Study's analysis because the County is not considering accepting them as feedstock. Additionally, while agricultural waste data was not reported to be by haulers or identified in the waste characterization study, the County facility decision matrix included acceptance of agricultural materials.

4.1 Infrastructure Alternative Definitions

Centralized Turned Windrow Composting Facility refers to a dedicated facility where a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, and agricultural waste) is processed into compost at a large scale. Compostable papers and plastic products would likely not be accepted at this facility initially, though the County could be poised to process them in the future as technology improves. Organic feedstock is formed into rows of long piles called windrows, which are agitated (turned) periodically to redistribute the feedstock and incorporate oxygen into the material. Finished compost can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

Centralized ASP Composting Facility refers to a dedicated facility where a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, and agricultural waste) is processed into compost at a large scale. Compostable papers and plastic products would likely not be accepted at this facility initially, though the County could be poised to process them in the future as technology improves. Organic feedstock is formed into piles with engineered dimensions and aerated through a network of piping to maintain oxygen levels throughout the material. This product can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

Decentralized Composting Facilities refers to a network of small to medium scale facilities that together process a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, compostable paper, and agricultural waste) into compost. Compostable papers and plastic products would likely not be accepted at these facilities initially, though the County could be poised to process them in the future as technology improves. Operators can employ methods such as static piles, turned windrows, aerated static piles, or in vessel composting to generate finished compost. In-vessel composting involves loading organic feedstock into an enclosed container fitted with forced aeration and/or mechanical agitation to automate the composting process. This product can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

AD Facility refers to a specialized facility of various scales where organic waste (manure, food waste, fats oils and grease) is processed through a fully contained system of tanks into biogas and digestate. Certain anaerobic digestion systems can additionally manage yard waste and agricultural waste. Compostable paper and compostable plastic products would not be diverted from the landfill waste stream. Biogas is a renewable energy source that can be used for heating, electricity generation, or vehicle fuel. Digestate can be used as a fertilizer, soil amendment, livestock bedding, or horticulture products.

Biochar Facility refers to a specialized facility where organic waste material or biomass (yard waste, branches / limbs / stumps, and agricultural waste) is partially combusted in the presence of limited oxygen to produce biochar, a stable, carbon-rich solid. This process, known as pyrolysis, not only helps in carbon sequestration but also produces a valuable soil amendment that can enhance soil fertility and reduce greenhouse gas emissions.

Organics Transfer Station Facility refers to a dedicated facility where organic waste is collected, sorted, pretreated, consolidated, and temporarily stored prior to transportation to its processing or disposal site. Pretreatment options can include mechanical, biological, thermal, chemical, or a combination of treatments. This facility would generate no finished products and rather relies on unaffiliated offsite processors to accept the organic waste for finishing. Because of this, any organic waste material could potentially be managed through an organics transfer station assuming that a processor has been identified to receive these materials for finishing.

4.2 Evaluation Criteria

The six infrastructure alternatives and the existing system were considered through 19 screening criteria to develop the decision matrix.

4.2.1 Critical Screening Criteria

All alternatives were initially screened using critical screening criteria. This removed an alternative if it didn't meet the County's needs regarding the following:

- **Maturity / Prevalence of Technology** defines whether the alternative shows a history of success in similar applications and scale.
- **System Resiliency** considers whether the County would maintain control over its own waste management.
- **End Products / Byproducts** analyzes the ability of an alternative to create a closed loop with amendments to improve local soil health.

These key prescreening criteria were chosen to align with the County's goals for a potential organics processing facility. The results of the critical screen criteria are summarized in Table 4-1. Through this prescreening evaluation, decentralized composting, AD, biochar, and organics transfer were all eliminated from the additional criteria screening included in the decision matrix.

While the matrix screened out these four alternatives as single solutions for the County's organic waste system, they can still contribute to organic waste diversion in the County. For example, the County fully

supports the diversion of material through small-scale decentralized facilities and biochar, but neither of these is likely to be the sole solution for the feedstock and scale of this project.[13]

Additionally, the existing system failed the prescreening criteria due to a lack of system resiliency that would support County control of its own waste management; however, it was still considered in the full matrix evaluation for comparative purposes.

A decentralized composting network was eliminated from this Study because it would require dozens, if not hundreds, of composting sites to process the volume generated by the County. The smaller processing capacity conditions make a decentralized composting network an unrealistic alternative to consider in the decision matrix; however, they are a valued contributor to the overall organics management system in tandem with any selected alternative technology. Compost Queen Public Benefit Corporation (PBC) in Fort Collins, Colorado, illustrates a decentralized composting system. They operate three composting sites (two on family farms and one at a botanical garden) and have an operating capacity to compost about 700 tons/year.[14] For reference, the County diverted about 41,500 tons of organic materials in 2023; therefore, a decentralized network would have to be enormous to support the anticipated tonnage of a County facility. Additionally, siting a compost facility is a challenge with a combination of environmental, community, and logistical concerns. A decentralized composting network would exacerbate this challenge due to the need to site multiple composting facilities.

AD was eliminated from this Study due to its lack of adoption across the state, its minimal feedstock acceptance compared to the County's desired feedstocks, and the minimal opportunities for its end/by products. There is no substantive use of AD to manage organics from the municipal solid waste stream in Colorado or nationally.[15] Implementing this option would reduce the current diverted feedstock that the County's system management prioritizes, falling short of system resiliency criteria. AD is at its best with consistent, reliable feedstocks, which are uncommon for municipal waste streams. Wood waste and yard waste, though manageable, are not ideal feedstocks for AD. These are key feedstocks that the County has expressed a desire to process. Additionally, biogas is the main end product of AD. Waste-to-energy projects don't have historical support from the County. Digestate is a byproduct of the AD process and, though it boasts several potential beneficial uses, it is often in reality a cost to dispose of. These conditions make AD an unrealistic alternative to consider further in this Study.

Biochar was eliminated due to its minimal feedstock acceptance compared to the County's desired feedstocks, its lack of national adoption of the technology, and the minimal opportunities for its end products. Biochar has limited compatible feedstocks and would not be able to compost food waste, the largest category of landfilled organic waste in the County. Implementing this option would reduce the current diverted feedstock that the County's system management prioritizes, falling short of system resiliency criteria. A commercial biochar market is developing in the State, but biochar adoption is relatively low.[16]

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[13] Boulder County. (2024, August). *Boulder County Announces 2024 Climate Innovation Fund Recipients*. https://bouldercounty.gov/news/boulder-county-announces-2024-climate-innovation-fund-recipients/

[14] BioCycle. (2024, August 6). *Amping Up Decentralized Composting Capacity*. https://www.biocycle.net/amping-up-decentralized-composting-capacity/

[15] Eunomia. (2024). *Colorado Organics Infrastructure Toolkit*. https://oitco.hylandcloud.com/cdphermpop/docpop/docpop.aspx?docid=27748668

[16] Colorado State University. (2024). *Biochar in Colorado – 0.509.* https://extension.colostate.edu/topic-areas/agriculture/biochar-in-colorado-0-509/

There is a similarly minimal existing market for the biochar product. These conditions make biochar a nonviable alternative to consider in the Decision matrix.

Finally, a new organics transfer station was eliminated due to its market competition with the County's existing system in dealing with organics. It would not meet the critical criteria to create a closed loop with amendments to improve local soil health. Currently, the County sends its yard waste to Western Disposal, so a new transfer station would be redundant and competition for Western Disposal, making it a nonviable alternative to continue studying in the full Decision matrix.[17]

4.2.2 Screening Criteria

After alternatives were considered for critical screening criteria, the following 16 remaining screening criteria were considered for the existing system, centralized turned windrow composting, and centralized ASP composting. These 16 remaining screening criteria can be grouped into four categories:

Diversion Considerations

- Acceptable Feedstocks
- Impact of Feedstock Contamination
- Impact to Waste Diversion
- Relative Retention Times

Siting Considerations

- Zoning Classification
- Relative Spatial Requirement
- Potential for Growth
- Impact to Greenhouse Gas Emissions

Operational Considerations

- Odor Implications
- Noise Implications
- Impact to Water Quality
- Impact to Air Quality

Financial Considerations

- Development Costs
- Capital Costs
- Operating Costs
- Market Competition

4.3 Methodology

The Decision matrix was developed by assigning weights and ratings to each of the alternatives for the 19 total screening criteria. The 19 screening criteria were assigned with a score of 1, 2, or 3. A score of 3 meant that the alternative is most likely advantageous to the County for the criteria considered, 2 meant that the alternative may or may not benefit the County for the criteria considered, and 1 meant that the alternative could be disadvantageous to the County for the criteria considered.

[17] Boulder County. (2024). *Yard Waste and Food Scrap Drop-off*. https://bouldercounty.gov/environment/composting/yard-waste-and-food-scrap-drop-off/

The County was then given the opportunity to assign a weight to each of the 19 screening criteria with a score of 1, 2, or 3. All weights were relative to those considered. A score of 3 means the criteria is of the highest priority to the County's goals for their management of organic waste; 2 means the criteria is of moderate priority to the County's goals for their management of organic waste; and 1 means the criteria is of the lowest priority to the County's goals for their management of organic waste.

Then, the weight and rating were multiplied to create a weighted score for each of the screening criteria and added up for each of the three alternatives for comparison.

4.4 Decision Matrix Results

The completed decision matrix is provided in Table 4-2. It shows the scores for the existing system (96 points), centralized ASP composting (91 points), and centralized turned windrow composting (87 points). All the options scored relatively high and within only a few points of one another. The existing system scored the highest overall; however, the importance of system resilience to manage responsibility over County-generated organics is a priority for the County. The primary advantages of ASP technology over windrow technology are the reduction of facility footprint, faster processing time, and the ability to manage odors. According to the decision matrix, a compost facility utilizing ASP technology could be the best option to meet the County’s goals through the development of new infrastructure.

5.0 Funding and Operating Evaluation

Public-private partnership (P3) funding and operating models were evaluated for this Study. Five private-sector organics haulers and processers in the Boulder County market were interviewed to provide a more comprehensive understanding of existing services, opportunities, and level of interest in a potential P3. Additionally, a review of potential funding mechanisms was conducted.

5.1 Public Private Partnership Models

P3's can be effective models to provide necessary infrastructure without the full financial risk falling on either the local government or the private sector. Effective P3's exist when both local governments and the private industry collaborate to share resources, capital investment, risk, and revenue. When considering a P3, a local government should consider the degree to which it wants to be involved in the operations and capital investment of a facility. The different types of arrangements and their corresponding responsibilities have advantages and disadvantages. Table 5-1, 5-2, 5-3, and 5-4 provide an overview of the different P3 options available to local governments and private businesses and evaluates the advantages and disadvantages of each model.

Overall, public-private partnerships offer Boulder County a flexible and potentially cost-effective approach to developing composting infrastructure, with the choice of model depending on the County's desired level of control, risk tolerance, and long-term operational goals.

5.2 P3 Interview Findings

Interviews were conducted with commercial organics haulers and processors currently engaged in the collection and/or processing of organic material from customers both within and outside the County. The purpose of the interviews was to provide a more comprehensive understanding of existing services, opportunities, and level of interest in a potential County P3.

5.2.1 Interview Methodology

The County identified five private companies to participate in the interview process. These five companies were identified as being representative of the organics industry in the County, regional, and national market. They represent both large and small companies, providing services locally, regionally, and/or nationally. These companies have not been pre-qualified for any future activity that could be conducted by the County (e.g., procurement) and would not be given any advantages in such a procurement because of their participation in the interview process.

Interviews were conducted in December 2024 and January 2025. Prior to an interview, a memorandum was provided to the interviewees that introduced the County's planning process and gave an overview of the purpose of this Study. The memorandum included a list of questions to guide the interview process and ensure consistency in the topics discussed with each of the companies. A copy of this memorandum is provided in Appendix A.

The interviews were conducted virtually via Teams, and County staff did not participate. As agreed by the County and the companies' representatives, the responses from individual companies are confidential and

are not disclosed in this memo. All results have been aggregated to understand the industry's interests and opinions as a whole.

5.2.2 Company Experience

Each interview began with a company overview, each company's experience with processing organic materials, and their current end markets. The following summarizes the responses:

- Commercial organic haulers provide multiple services to meet their customers' varied needs. These include hauling, pre-processing, sorting, grinding, transferring, composting, and selling finished organic products.
- Haulers collect and process tonnage from residential, commercial, and industrial sources.
- These private companies have organic processing experience nationally, regionally, and locally. Two companies even work internationally in Canada.
- These companies are most familiar with working with windrow and ASP composting. One company works with in-vessel composting outside Colorado, and another company works with modified static aerobic piles (MSAP) and the GORE® Cover System.
- All companies have experience processing at least one, if not all the following: yard trimmings, food waste, compostable products, wood waste, and agricultural waste.
- Compostable products are the most troublesome to process, and none of the companies currently accept them in their feedstock.
- Landscapers, the Department of Transportation (DOT), topsoil amendments, and wholesalers are the biggest end markets for finished compost in the State.
- Some companies have trouble getting rid of their finished compost, either giving it away for free or paying to remove it, while other companies sell it easily.

5.2.3 Challenges to Organics Diversion in the County

During the interviews, haulers were asked to describe the challenges and barriers to organics diversion in the County. The following summarizes the responses and is the opinion of those interviewed. Note that not all the haulers expressed each response.

- There is a general lack of infrastructure for organics processing in the County.
- Plastic and compostable products contamination is a challenge with food waste.
- End markets for compost are a big challenge. It is important to have a clean end product without contamination of plastic (whether compostable or not). There is not enough demand currently for compost contaminated with compostable plastics, and there is also limited demand for clean compost.
- Colorado's high altitude and climate make processing and selling compost difficult due to dryness and seasonal demand.
- The current compost facility that the County uses is far away, which drives up hauling distance and cost.
- There are concerns about changing/emerging Environmental Protection Agency (EPA) regulations and PFAS restrictions that could affect compost contamination.

5.2.4 Opportunities for County Involvement

Haulers were asked what the County could do to help increase organics diversion and improve the marketability of compost. The following summarizes the responses. Note that each of the responses were not expressed by all the haulers.

- Closer infrastructure that would reduce hauling distance would be economically beneficial as long as tipping fees stay competitive.
- Education and outreach are key to ensure compost is not contaminated.
- County ordinances need to be better enforced for more efficient organics diversion.
- The County needs to be a major end market for composters, perhaps putting a requirement that all County projects must use a certain amount of compost or organize free compost giveaway days.
- Some haulers recommend that the County start small with limited feedstock and size. Then, they can expand as more public and private investment is introduced.

5.2.5 P3 Interest

In each interview, haulers were asked about their experience with P3 arrangements for organics materials management, their interest in working with the County in one, and their preferred scenario for a facility within the County. The following summarizes the responses based on potential partnerships. Note that each of the responses was not expressed by all the haulers, and many of these answers were tentative until more information was confirmed.

- Most companies say they are open or interested in having a follow-up conversation about a P3.
- Many companies find great benefit in the County permitting a facility as opposed to the private company attempting that.
- Location would be a major factor in accepting a P3, with acreage for future facility expansion being a plus.
- There is interest in P3 for a composting facility, specifically for a County developed, privately operated model.
- Often, private companies would prefer to provide the cost of capital upfront and participate in an agreement that would ensure they recoup the costs within a set number of years. Most private companies are willing to provide the equipment as they have the best expertise.
- Some private companies have experience participating in an existing P3 on a city and county level, both within and outside of Colorado.

5.3 Potential Funding Mechanisms

This section outlines available state and federal funding opportunities that could support the development, construction, and operation of a composting facility in the County.

5.3.1 State Funding

Colorado Bill HB22-1355, titled “Producer Responsibility Program for Recycling,” was signed in June 2022 and required the implementation of a statewide extended producer responsibility (EPR) program. This program covers packaging material intended for single or short-term use. Certified compostable products is

also covered; thus, facilities that process such compostable products may be eligible to receive grant funding. The grant focus is on infrastructure and is anticipated to have annual grant funding.[18]

Colorado Bill HB24-1449, titled "Environmental Sustainability Circular Economy," was signed in May 2024 and supports funding opportunities for projects that promote a circular economy. These grants are funded by a fee on solid waste disposed of in Colorado landfills and are organized by the Colorado Circular Communities (C3) program. Composting production qualifies as a circular economy project and has the potential to get funding from this program. Applicants can apply for Mini Grants (awards up to $50,000), Impact Grants ($50,000 to $250,000), and Capacity Building Grants (over $250,000).[19]

5.3.2 Federal Funding

The United States Department of Agriculture (USDA)'s Composting and Food Waste Reduction (CFWR) program, authorized by the 2018 Farm Bill and funded by the American Rescue Plan Act of 2021, provides cooperative agreements to local and municipal governments. These agreements support projects that develop and implement strategies for municipal composting and food waste reduction. Funded activities include acquiring materials and equipment for composting, collecting food waste, and conducting training. Projects prioritizing economic benefits, community compost accessibility, food recovery integration, and multi-partner collaborations are favored. County governments are eligible to apply for either a Planning Project grant or an Implementation Project grant. The USDA's Natural Resources Conservation Service (NRCS), leading the Office of Urban Agriculture and Innovative Production (OUAIP), administers the program.[20] In 2024, the program awarded $7.5 million to 26 projects.[21]

[18] CAA Consultation Session 4: Compostables. (2024). *Circular Action Alliance*. https://static1.squarespace.com/static/64260ed078c36925b1cf3385/t/66d9d2b3bb63501c73083467/1725551283921/CAA-Consultation+Session-Compostables_FINAL%5B74%5D.pdf

[19] Funding Opportunities. (n.d.). *Colorado Circular Communities*. https://coloradocircularcommunities.org/funding-opportunities

[20] USDA. (2025). *FY2023 CFWR Composting and Food Waste Reduction Program FAQs*. https://www.usda.gov/farming-and-ranching/agricultural-education-and-outreach/urban-agriculture-and-innovative-production/composting-and-food-waste-reduction-cfwr-cooperative-agreements/fy2023-cfwr-composting-and-food-waste-reduction-program-faqs

[21] USDA. (2024). *USDA Invests More than $7.5 Million in Composting and Food Waste Reduction Projects*. https://www.nrcs.usda.gov/news/usda-invests-more-than-75-million-in-composting-and-food-waste-reduction-projects/

6.0 Phase 1 Key Findings and Next Steps

The County is committed to achieving its zero waste goal through actions like increasing organics diversion. This Study explored options for managing the County's organic waste and the following are the key findings.

- The County relies on various haulers and drop-off centers where most organics are trucked 45–60 miles to A1 Organics. System challenges include long transport, limited control over accepted materials, and no large-scale local composting.
- In 2023, the County diverted about 41,500 tons of organic material, and approximately another 80,000 tons of organic material is still being landfilled, highlighting the opportunity for expanded composting services.
- Compostable products were evaluated but not included in the matrix evaluation due to contamination risks, processing issues, and limited end market availability. However, they may be accepted at this facility in the future as technology evolves.
- The Study evaluated six composting infrastructure alternatives using a decision matrix with 19 criteria. The centrally located compost facility with ASP technology emerged as the optimal option due to its smaller footprint, faster processing, and better odor control.
- Interviews with five haulers and processors showed strong interest in participating in a P3, provided the project is financially viable and includes shared responsibility for feedstock, costs, and marketing the final product.

6.1 Next Steps

Phase 1 of this Study laid the groundwork for understanding the feasibility of a County compost facility. Phase 2 will continue this work and include sizing calculations and a siting study of a potential location, an evaluation of end markets, and the financial feasibility of potential funding and operating models with a centralized ASP composting facility. Phase 2 will conclude with another presentation to the public and the Board of County Commissioners.

Tables

Table 2-1

Regional Class III Compost Facilities

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Name	Location	County	Accepted Material Types
A1 Organics	12002 WCR 59 Keenesburg, CO 80643	Weld	Food waste, yard waste
WM Denver Arapahoe Disposal Site	3500 Gun Club Road Aurora, 80018	Arapahoe	Food waste, yard waste, biosolids, industrial waste

Table 2-2

Yard Waste and Food Scrap Drop Off Location Information

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Community Organics Drop-Off Locations	Address	Materials Accepted	Giveaways
Allenspark Sort Yard	8200 Hwy 7 Allenspark, CO 80510	Yard Waste	Wood for arts and crafts projects and compost-like material are available for free.
Eco-Cycles Center for Hard to Recycle Material (CHaRM)	6400 Arapahoe Rd Boulder, CO 80301	Food Waste	N/A
Longmont Recycling Center	140 Martin St. Longmont, CO 80501	Yard Waste, Food Waste	Limbs and yard waste are ground into mulch, which is available to Longmont residents free of charge.
Nederland Sort Yard	291 Ridge Road Nederland, CO 80466	Yard Waste	Wood for arts and crafts projects and compost-like material are available for free.
Nederland Transfer Station and Recycling Drop-Off	286 Ridge Road Nederland, CO 80466	Yard Waste, Food Waste	N/A
Western Disposal Materials Management Center	2051 63rd Street Boulder, CO 80301	Yard Waste, Wood Waste	N/A

Table 2-3

The County Municipalities' Residential Organics Collection Systems

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

City	Estimated 2023 Population (Per Census)[22]	Provision of Service	Hauler	Organics Service System
Boulder[23]	105,898	Open Market	Multiple	Universal Curbside
Longmont[24]	98,630	Municipal Hauler	Waste Services	Opt-In
Erie[25]	35,269	Open Market	Multiple	Opt-In
Lafayette[26]	30,439	Municipal Contract	Republic Services	Universal Curbside
Louisville[27]	20,390	Municipal Contract	Republic Services	Universal Curbside
Superior[28]	13,361	Municipal Contract	Waste Connections	Opt-In
Lyons[29]	2,151	Municipal Contract	Western Disposal	Opt-In
Unincorporated	24,620	Open Market	Multiple	Universal Curbside

[22] United States Census Bureau. (2023). *City and Town Population Totals: 2020-2023*. https://www2.census.gov/programs-surveys/popest/tables/2020-2023/cities/totals/SUB-IP-EST2023-POP-08.xlsx

[23] City of Boulder. (2024). *Waste Haulers Providing Regularly Scheduled Collection Services*. https://bouldercolorado.gov/services/waste-haulers-providing-regularly-scheduled-collection-services

[24] City of Longmont, Colorado. (2024). *Composting*. https://longmontcolorado.gov/waste-services-trash-recycling-composting/composting/

[25] Town of Erie. (2024). *Recycling & Waste Disposal*. https://www.erieco.gov/872/Recycling-Waste-Disposal

[26] City of Lafayette. (2024). *Garbage, Recycling, and Compost*. https://www.lafayetteco.gov/2420/Garbage-Recycling-and-Compost

[27] City of Louisville. (2024). *Composting*. https://www.louisvilleco.gov/living-in-louisville/residents/sustainability/waste-and-diversion/composting

[28] Town of Superior. (2024). *Trash, Recycling, Compost, and Yard Waste Services*. https://www.superiorcolorado.gov/services/trash-recycling

[29] Lyons, Colorado. (2024). *Sustainability Resources: Waste*. https://www.townoflyons.com/369/Sustainability-Resources-Waste

Table 3-1

The Composting Process and Its Contamination Challenges

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

	Feedstocks	Pre-Processing	Active Processing	Post-Processing	End Market
Compost Facility Process	Organic waste is separated from the landfill stream by commercial and residential generators.	Contamination, like plastic bags, silverware, glass, and other non-compostable materials, is removed from feedstocks through manual and/or mechanical means.	Feedstock is converted into finished compost through active composting and curing.	Finished compost is screened for product sizing specifications and final contamination removal.	Compost is utilized internally as a cost-saving measure or sold for use.
Contamination Challenges	Indistinguishable products. Non-compostable products contaminate the feedstock.	Indistinguishable products. Both non-compostable contamination and compostable products are likely removed and landfilled.	Compostable products rarely break down completely in practice.	Not all contamination fragments are caught through screening.	Organic and inorganic fragments remain, lowering the value. Not certifiable as organic. May contain PFAS.

Table 3-2

Compostable Product in Feedstock Scenarios

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Scenarios		Challenges
1	Accept compostable products from the residential sector WITHOUT pre-processing	• Windblown litter • Contaminated end product
2	Accept compostable products from the residential sector WITH pre-processing	• Compostable materials are removed and landfilled • Slightly cleaner, but still a contaminated end product
3	Accept only a limited list of compostable products (e.g., coffee filters and paper towels) from residential	• Requires significant education • Slightly cleaner, but still a contaminated end product
4	Do not accept compostable products	• Compostable materials are landfilled

Table 4-1

Critical Screen Criteria Results

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Critical Criteria Screening	Existing System	Centralized Turned Windrow Composting	Centralized ASP Composting	Decentralized Composting	Anaerobic Digestion	Biochar	Organics Transfer Station
Maturity / Prevalence of Technology	Pass	Pass	Pass	Fail	Fail	Fail	Pass
System Resiliency	Fail	Pass	Pass	Pass	Fail	Fail	Pass
End Product / Byproducts	Pass	Pass	Pass	Pass	Pass	Pass	Fail

Table 4-2
Decision Matrix
Phase 1: Compost Facility Feasibility Study
Boulder County, CO

Critical Screening Key:	**Pass**	Any alternative receiving a rating of '2' or '3' on those criteria identified as critical by the County has passed this screening and is further scored below.
	Fail	Any alternative receiving a rating of '1' on those criteria identified as critical by the County has failed this screening and is not considered for further scoring.
Criteria Rating Key:	**3**	This alternative is most likely advantageous to the County for the criteria considered.
	2	This alternative may or may not benefit the County for the criteria considered.
	1	This alternative could be disadvantageous to the County for the criteria considered.
Criteria Weighting Key:	**3**	Relative to those considered, this criteria is of the highest priority to the County's goals for their management of organic waste
	2	Relative to those considered, this criteria is of moderate priority to the County's goals for their management of organic waste
	1	Relative to those considered, this criteria is of the lowest priority to the County's goals for their management of organic waste

Critical Criteria Screening		**Existing System**		**Centralized Turned Windrow Composting**		**Centralized Aerated Static Pile (ASP) Composting**		**Decentralized Composting**		**Anaerobic Digestion (AD)**		**Biochar**		**Organics Transfer Station**	
		Pass / Fail		**Pass / Fail**		**Pass / Fail**		**Pass / Fail**		**Pass / Fail**		**Pass / Fail**		**Pass / Fail**	
Maturity / Prevalence of Technology		Pass		Pass		Pass		Fail		Fail		Fail		Pass	
System Resiliency		Fail		Pass		Pass		Pass		Fail		Fail		Pass	
End Product / Byproducts		Pass		Pass		Pass		Pass		Pass		Pass		Fail	
Criteria	**Weight**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**
Maturity / Prevalence of Technology	3	3	9	3	9	3	9	-	-	-	-	-	-	-	-
System Resiliency	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Acceptable Feedstocks	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Impact of Feedstock Contamination	3	2	6	2	6	2	6	-	-	-	-	-	-	-	-
Impact to Waste Diversion	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Zoning Classification	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
Relative Retention Times	1	3	3	1	1	2	2	-	-	-	-	-	-	-	-
Relative Spatial Requirement	2	3	6	1	2	2	4	-	-	-	-	-	-	-	-
Potential for Growth	2	1	2	3	6	2	4	-	-	-	-	-	-	-	-
Impact to Greenhouse Gas Emissions	2	1	2	2	4	2	4	-	-	-	-	-	-	-	-
Odor Implications	3	3	9	2	6	2	6	-	-	-	-	-	-	-	-
Noise Implications	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
Impact to Water Quality	3	3	9	1	3	2	6	-	-	-	-	-	-	-	-
Impact to Air Quality	2	1	2	2	4	2	4	-	-	-	-	-	-	-	-
Development Costs	2	3	6	1	2	2	4	-	-	-	-	-	-	-	-
Capital Costs	2	3	6	2	4	1	2	-	-	-	-	-	-	-	-
Operating Costs	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
End Product / Byproducts	3	2	6	3	9	3	9	-	-	-	-	-	-	-	-
Market Competition	1	3	3	1	1	1	1	-	-	-	-	-	-	-	-
Total Score			**96**		**87**		**91**		**FAILED**		**FAILED**		**FAILED**		**FAILED**

Table 5-1

Examples of P3 Models

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Responsibility	County-Owned and Operated	County-Owned with Private Operations[1]	Privately Owned and Operated on County Land[2]	Processing Services Agreement
Land Ownership	County	County	County	Private
Capital Investment	County	County	Private	Private
Operations	County	Private	Private	Private

1. Typically, this arrangement is done through a procurement process for a long-term contract with a private operator with additional variations.
2. True P3 arrangement with additional variations within these options for design, construction, and operation responsibilities

Table 5-2

Composting Land Ownership Evaluation

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Owner	Possible Advantages	Possible Disadvantages
Local Government	• Flexibility with P3 structures • Cost savings if local government already owns land • Can retain facility long-term • High control of facility and overall site (e.g. potential future expansion)	• Increased level of effort • Higher risk to the local government
Private	• Lower level of effort for local government • Lower risk to the local government	• No local government involvement • Local government will not retain facility in the long-term • Low control of facility and site

Table 5-3

Composting Operations Evaluation

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Operator	Possible Advantages	Possible Disadvantages
Local Government	• Local government to receive 100% of the revenue • Control over operational standards	• Limited composting processing experience • Sole responsibility for sourcing material • Limited in materials marketing capabilities, scale, and experience • Hiring and other aspects of facility staffing may be constrained by public hiring and human resources processes
Private	• Experience with compost processing • Local government and private company work together to source material • Potential to market a large volume of material from multiple facilities • Sophisticated materials marketing (e.g. hedging, derivatives)	• Local government must manage contractor and provide oversight • Local government likely to incur processing fee and must share revenue • Local government has limited control over operations

Table 5-4

Composting Capital Investment Evaluation

Phase 1: Compost Facility Feasibility Study

Boulder County, CO

Investor	Possible Advantages	Possible Disadvantages
Local Government	• Municipal cost of capital is lower • Local government does not have to earn a return on capital investment • Potentially longer depreciation period • High control of facility and overall site	• Large capital outlay for local government • Potentially longer project schedule • Higher risk
Private	• No capital outlay required by local government • Potential for some cost and/or schedule savings due to private-led procurement processes • Lower risk	• Higher cost of capital • Private will compress depreciation period to match contract term • Private must earn a return on capital investment • Lower control over facility and site

Appendix A – Memo for Hauler Interviews

Boulder County Compost Facility Feasibility Study

Stakeholder Engagement Letter and Interview Questions

Introduction:

Boulder County is investigating the feasibility of developing a centralized compost facility within the County. As part of the evaluation, the County is engaging stakeholders to understand potential interest in a public private partnership to develop and operate the facility. The County has retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to evaluate the feasibility of a potential composting facility and to conduct interviews with organic material processors.

The County is at the beginning of evaluating the feasibility and does not have a site or a technology determined. The County does not intend to collect or haul organic materials and will rely on private haulers for delivery of materials to the proposed compost facility.

Burns & McDonnell will be scheduling virtual interviews between December 10, 2024, and January 8, 2025 and we invite your organization to participate. Virtual interviews may be scheduled by contacting Kayla Benson at kebenson@burnsmcd.com or calling 708-267-7344.

If you cannot participate in a virtual interview, we also welcome a submittal of your written response to the questions below to kebenson@burnsmcd.com. Written responses must be received by January 8, 2025, to be included in the study. Your input is valuable, and we would like to hear from you.

The following is a list of the questions that we would like to discuss during the interviews. **All information provided by private companies will be aggregated and not publicly disclosed in our report to protect the confidentiality of the respondents.**

Organics Material Processors

1. Provide a company overview and describe your experience with processing organic materials.

    - Material types collected/processed (food waste, yard waste, brush, etc.)?
    - Generators (residential, commercial, industrial)?
    - Quantities of material managed from generators in Boulder County?
    - Approximate facility/ies footprint and throughput in tonnage or yards?

2. What are the challenges to organics waste diversion in Boulder County?

3. What policies or actions could the County take to support your organization being successful at increasing organics diversion in Boulder County?

4. What are the infrastructure needs to increase organics diversion in Boulder County?

5. Would you be interested in a public-private partnership with Boulder County and which options would your company have an interest in responding to an RFP: operations only or operations and facility development?

6. Do you have any experience with a public-private partnership arrangement for organic materials management? If so, please describe.

7. Describe advantages and disadvantages for a County-owned and operated facility as compared to the County partnering with a private company.

8. What would be the optimal or preferred public-private partnership scenario for a facility within Boulder County? Be specific as possible in describing the arrangements of ownership of land, investment in development, equipment ownership, operations, and profit sharing.

9. The County wants to create an equitable arrangement, a sustainable organics management system, and divert as much suitable organic material as possible. What would you propose as a financial arrangement that is win/win for both you and the County (specifically regarding additional material that is brought to the facility)?

10. The County is considering a variety of technologies. What is your experience and interest in each of these technologies:

    - Windrow
    - Aerated Static Pile
    - In Vessel
    - Other not listed above

11. The County is considering a variety of feedstocks. What is your experience and interest in processing each of these feedstocks:

    - Brush and yard trimmings
    - Food waste
    - Compostable products (paper and plastic)

- Wood waste (e.g., wood pallets)
- Agricultural waste

12. Would the County need to guarantee feedstock quantities? If so, what material types and quantities? If so, please answer the follow-on questions below:

    a. What level of contamination could you manage?

    b. What is your approach to contaminant removal?

    c. How would you address compostable products (paper and plastics)?

13. Can your company commit feedstock to the facility? If yes, approximately how many tons (by material type) would you have to commit?

14. Describe your approach to marketing compost. What are your major market categories for finished compost?
    - Agriculture
    - Landscaping
    - Horticulture
    - Retail
    - Topsoil
    - Department of Transportation
    - Landfill
    - Other (please describe):

15. What additional services do you provide at the point of sale?
    - Blending
    - Bagging
    - Delivery
    - Spreading
    - Blower Truck
    - Testing / Analysis
    - Product Education
    - Other (please describe):
    - None

16. What are the greatest barriers that your facility faces in marketing compost?

17. How can the County help improve the marketability of compost?

18. What other ideas or recommendations would you like to share with the County?